Fish Gallbladder Poisoning Presenting with Acute Renal Failure and Hepatitis: Myth or a Fact: A Case Series

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Fish gallbladder poisoning is thought to be associated with acute renal and hepatic failure in few regions of India. Here, we present a case series of five cases of fish gallbladder poisoning (*Labeo rohita*, widely found in the northern eastern parts of India like Odisha, West Bengal, and Assam). After ingestion of gallbladder of *Labeo rohita*, the cases presented with cramping abdominal pain, decreased urination, nausea and vomiting, and subsequently developed renal and hepatic dysfunction. Subsequently, the patients improved completely with hemodialysis and conservative management. Biopsy of kidney tissue showed early tubular necrosis. **Keywords**: Acute tubular necrosis, Fish Gallbladder, Hepatic failure, Hemodialysis, *Labeo rohita*, Type-2 diabetes mellitus.

**Introduction**: In India, eastern regions like Odisha, Assam, and West Bengal, people are very fond of taking fish in their diet. In some areas, people believe in the myth that taking fish bile is helpful in curing some diseases like diabetes mellitus, asthma, and rheumatoid arthritis or as an immunity booster and also increased vision. Due to frequent consumption of fish gallbladder, fish bile poisoning cases are reported more commonly in China, India, Japan, and other Asian countries. There were many reports about fish gallbladder poisoning, leading to acute renal failure (ARF), acute liver injury, and therefore increasing mortality. We report a case series of five cases, all of which presented with acute renal failure and three with associated liver failure after ingestion of fish gallbladder. Out of them, two were diabetic who had taken raw fish bile with a belief that it will cure them of diabetes. **Case series**: Our case series consists of five cases of ages between 30 and 50 years, who presented with complaints of abdominal pain, vomiting, and decreased urination to the Emergency Department. After taking history, all of them confirmed to have intake of fish gallbladder within the last 12 hours. They subsequently developed acute renal failure and also liver failure, as confirmed by renal and liver function tests. Biopsy of kidney showed acute tubular necrosis. All of them were managed conservatively with hemodialysis for few episodes and completely recovered and discharged stable to home around 10 days post admission. Here, we present the five cases of fish bile poisoning with lab and biopsy reports attached.

**Discussion**: *Labeo rohita*, the Indian fish carp, Rohu is a very common food in few parts of India. The hepatitis and acute tubular necrosis found after intake of fish gallbladder may be attributable to hepatotoxins and nephrotoxic rather than the infective agent present in it. Cyprinol, a C27 alcohol found in the bile of cyprinid fish gallbladder.

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<th>Name</th>
<th>Age – 30 yrs female</th>
<th>Age – 35 yrs male</th>
<th>Age – 38 yrs female</th>
<th>Age – 55 yrs male</th>
<th>Age – 32 yrs male</th>
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<td>Complain</td>
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<td>Decreased urination and swelling all over the body</td>
<td>Decreased urination, vomiting, swelling, and hematuria</td>
<td>Decreased urination</td>
<td>Pain in the abdomen, vomiting, and decreased urination</td>
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<td>Condition after 1 month</td>
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fish, i.e., mostly fresh water, may have a direct toxic effect on the tubules, leading to serious acute tubular necrosis resulting in ARF and uremia and relieved by hemodialysis. Cyprinol sulfate, a dangerous toxin found in fish bile when injected intravenous to anesthetized rat, leads to renal failure. This poison may also have some neurological manifestations like convulsion. Lethal dose is 2.6 mL or 20 gm in mouse. The volume or size of cyprinid fish ingested correlates with more risk of intoxication. After ingestion of fish gallbladder, raw or cooked, most people manifest cramping abdominal pain, nausea, vomiting, and malaise within 12 hours, which is similar to our case series, and subsequently leads to decreased urination leading to acute renal failure and acute liver injury as evidenced by deranged renal and liver function tests. The incidence of ARF in fish bile poisoning is 55–100%, while the mortality rate accounts for 91.7%. Recently, studies have shown that fish gallbladder can also damage the heart, liver, and gastrointestinal tract and lead to multiple organ dysfunction syndrome (MODS).
communication and interdisciplinary meetings with family and to end-of-life in the ICU are accepted well with comprehensive allopathic, which we have adopted. My observations with respect to medical systems like Ayurveda and other practices also, including the process. The futility of care is comprehended well too in our Indian objective and subjective assessment of medical futility and the dying discussions can begin. These should be based on the physician's mortality is essential to identify the patients with whom EOLC in providing end-of-life care (EOLC). A reasonable prediction of Recognizing medical futility and the dying process is the first step is not extinguishing the light; it is putting out the lamp because respected always. In our culture, death is respected equally. “Death

DOI: 1

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Dignity and quality of life are equally important. Death must be respected always. In our culture, death is respected equally. “Death is not extinguishing the light; it is putting out the lamp because the dawn has come.” – Rabindranath Tagore

Recognizing medical futility and the dying process is the first step in providing end-of-life care (EOLC). A reasonable prediction of mortality is essential to identify the patients with whom EOLC discussions can begin. These should be based on the physician’s objective and subjective assessment of medical futility and the dying process. The futility of care is comprehended well too in our Indian medical systems like Ayurveda and other practices also, including allopathic, which we have adopted. My observations with respect to end-of-life in the ICU are accepted well with comprehensive communication and interdisciplinary meetings with family and surrogates. Key factor is knowledge provided to the patient and

family in the beginning of diagnosis of certain diseases with downhill trajectory. Examples are malignant CVA, severe LV dysfunction, progressive kidney injury, and malignant metastatic cancers, so also in chronic diseases like DM, HTN, and CAD. More important is the discussion by the family doctor. Everyone with a life-limiting illness has a right to a life free from pain and distress, psychosocial or spiritual, and also the right to a dignified life that includes the process of death. Though the natural course of many diseases to some extent is predictable, many other factors contribute to a better understanding of the same. Education, religion, spirituality, and beliefs play roles. In fact, people from villages and orthodox families comply better with adequate discussions. Communication should be taught in the undergraduate curriculum, and distinction of curative and palliative medicine in which end-of-life care is vital also needs to be included. Fragmentation of these distinctions by different clinicians causes confusion among doctors and families. Prompt identification of irreversible disease processes is essential to prevent any malfeasance. Patients, families, and healthcare providers should be educated about the appropriateness of ICU admission, nature of ICU interventions, including resuscitation, outcomes and futility of these interventions, and detailed information on alternatives to ICU admission. Good palliative and EOLC are not just the alternative, but also a superior and most appropriate mode of treatment when compared with inappropriate ICU admission.

Celphos Poison New Strategy of Treatment Improves Survival Rate Remarkably
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References
Delayed cerebral ischemia is the prime cause of adverse outcomes following the occlusion of the aneurysm in patients with aneurysmal subarachnoid hemorrhage. Various biomarkers have been studied in an attempt for predicting delayed cerebral ischemia. Matrix metalloproteinase 9 (MMP-9) has been shown to be involved in early brain injury in previous studies. We hypothesized that serum MMP-9 levels can predict the development of delayed cerebral ischemia. Matrix metalloproteinase 9 (MMM-9) has been shown to be involved in early brain injury in previous studies. We hypothesized that serum MMP-9 levels can predict the development of delayed cerebral ischemia.

**Introduction:** Celphos is a pesticide, chemical name aluminum phosphide, it reacts with the HCl of the stomach and generates PH3 gas, which circulates in the blood and paralyzes ETS of mitochondria, thus, I concentrate my study in two parts: decreased absorption and fast expulsion.

\[ \text{AIP} + \text{H}_2\text{O} \rightarrow \text{Al OH}_3 + \text{PH}_3 \\
\text{AIP} + \text{HCl} \rightarrow \text{AlCl}_3 + \text{PH}_3 \]

To decrease absorption, I use coconut oil plus soda bicarb for gastric lavage, soda bicarb neutralizes HCl, and coconut oil forms a layer in the stomach and also does not react with celphos, so very minimal phosine gas is released.

In the second part, we recommend early ventilation with high RR and sedation for fast expulsion of PH3, and also to less utilization of energy system.

**Aim/Objective:** To study effectiveness of new treatment for celphos poisoning.

**Setting and design:** About 25 patients admitted to our hospital after taking celphos poison were evaluated for a new strategy of treatment as compared with traditional treatment.

**Materials and methods:** Every patient admitted in our hospital for treatment of celphos poisoning, we followed the old treatment protocol earlier till November 2012, and after that, in the new era of treatment, we started giving gastric lavage with soda bicarb and coconut oil as a first step. In the second step, the sedative was given to the patient to reduce energy consumption, and at last, in the third step, the patient was put on a ventilator to facilitate fast expulsion of gas. Statistical analysis: As compared with previous treatment, new-era treatment is statistically very significant.

**Result:** New strategy of treatment shows encouraging results.

**Conclusion:** Ordinary treatment should be replaced by a new era of treatment.

**Communication during COVID – A Family Satisfaction Survey**

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**Objectives:** Good communication is a part of patient-centered health care. The families of patients admitted to the intensive care unit are at higher risk of developing anxiety, depression, and post-traumatic stress disorder. This effect is exaggerated during the COVID pandemic as there was a strict no-visitor policy. There is no literature documenting the method or efficacy of virtual communications used in COVID. The target of the study was to see if audio-based telephone consultation can be as satisfying as face-to-face communication.

**Materials and methods:** Options of communication in the COVID unit were limited to voice calls, video calls, conference calls, and zoom calls. The rules of communication were explained on the first contact, and it was strictly adhered to. The ICU consultant called the next of kin between 2 and 5 pm everyday with clinical update. Conference calls were also done so that multiple family members can come together virtually and have a common update. Prior to intubation, a video call was done with the near and dear. Following extubation, video calls were resumed on a once-a-day basis. Death declaration was done on the phone for both anticipated death and unanticipated deaths.

**Survey:** We used Google forms for our survey. The forms were sent via online or WhatsApp links. The responses were collected in an anonymous form. All questions were rated on a scale of one to five, from very dissatisfied to very satisfied. Statistical analyses: As this was a descriptive survey, we used Excel sheet to analyze the data. Scores 1 and 2 were taken as unsatisfactory from the communication point of view. Scores more than 3 were considered as positive communication.

**Results:** The response rate for our questionnaire survey was 91%. Overall, 91% responders were satisfied with the fixed time of communications. Only 14 responders (3.3%) were dissatisfied. Overall, 91% of relatives were satisfied with the frequency of communication that was once a day. Looking at the quality of communications, 335 (77.4%) people were very satisfied with the information that was shared with them with regard to the progress of their patient’s medical condition. Overall, 380 (91%) relatives were satisfied with the quality of communications. Only 14 relatives were dissatisfied with the quality of communication and 10 people gave us borderline scores. Regarding family contact with video calls and conference calls, 337 (83%) of people were highly satisfied, and overall, 358 people were satisfied with the process of virtual interaction. Majority of the survey families were happy with the virtual visit format. Out of the 404 responses we received for our survey, there were 21 families who had lost their loved ones. Out of them, 18 families were satisfied with the end-of-life communications we had provided, only 3 families were dissatisfied.

**Conclusion:** Healthcare sector is the most sensitive sector when it comes to communications. The virtual platform for communication has been new to healthcare workers, patients, and families alike. To adapt to this platform and to deliver effective communication has not been easy, but this study shows that by adhering to the basic principles of communication and adapting it to the technology, it is possible to achieve satisfactory communications even in a developing country like India.

**Serum MMP-9 Levels as a Predictor of Delayed Cerebral Ischemia in Aneurysmal Subarachnoid Hemorrhage**

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**Background:** Delayed cerebral ischemia is the prime cause of adverse outcomes following the occlusion of the aneurysm in patients with aneurysmal subarachnoid hemorrhage. Various biomarkers have been studied in an attempt for predicting delayed cerebral ischemia. Matrix metalloproteinase 9 (MMP-9) has been shown to be involved in early brain injury in previous studies. We hypothesized that serum MMP-9 levels can predict the development of delayed cerebral ischemia.

**Methodology:** We measured serum MMP-9 levels at admission, on postoperative day 3 and post-ictus day 10, and correlated the values with the development of delayed cerebral ischemia in 98 patients with age more than 18 years who presented within 4 days of ictus and planned for either endovascular...
coiling or surgical clipping of the aneurysm. About 49 patients had developed DCI and were included in the “DCI” group, and 49 patients did not develop DCI and were categorized into the “no DCI” group. We also correlated MMP-9 levels with middle cerebral artery (MCA) mean flow velocity from TCD and the neurological outcome measured by the modified Rankin score on discharge and 3 months, and the Glasgow outcome scale extended at 3 months. Results: The baseline preoperative serum MMP-9 levels were comparable between the two groups, 18.17 (IQR 14.22–22.27) in the no DCI group and 18.32 (IQR 15.72–25.75), with a p-value of 0.371. The serum MMP-9 levels measured on postoperative day 3 were 17.67 (IQR 13.92–25.39) in the no DCI group and 19.14 (IQR 15.19–23.99) in the DCI group, the values were comparable, with a p-value of 0.484. The serum MMP-9 levels on day 10 of ictus were also comparable between the two groups, 17.77 (IQR 13.75–23.36) in the no DCI group and 18.55 (IQR 13.03–21.72) in the DCI group, with a p-value of 0.5. There was no correlation between the serum MMP-9 levels and the development of delayed cerebral ischemia. The mean of all measured MCA mean-flow velocities in the DCI group was 111 (IQR 92–121) and the no DCI group was 81 (IQR 72–89), with a p-value <0.001. Eight (16.3%) patients in the no DCI group had flow velocities recorded >120 cm/s, and 31 (63.3%) patients in the DCI group had flow velocities >120 cm/s during any of the days monitored. The maximum recorded mean-flow velocities were 92 (IQR 83–108) in the no DCI group and 122 (IQR 116–144) in the DCI group, with a p-value <0.001. There was no correlation between the serum MMP-9 levels and the MCA mean-flow velocities on TCD and the neurological outcome. Male gender, GCS at admission, and modified Fisher scores were found to be predictive factors for the development of delayed cerebral ischemia (p <0.001). Conclusion: Serum MMP-9 levels are not predictive of the development of delayed cerebral ischemia.

A Retrospective Cohort Study: High vs Low Dose of Methylprednisolone in Severe COVID-19 Patients

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Introduction: We aimed to evaluate the efficacy of high doses (HDs) of corticosteroids in regard to low doses (LDs) in hospitalized patients with COVID-19 who developed an ARDS.

Materials and methods: Study design: This single-center, retrospective observational study was performed at SPS Hospitals Ludhiana, intensive care unit, Punjab, with confirmed cases of COVID-19 from February 2021 to July 2021. Data collection: Two different groups of patients were established depending on the dosages of steroids administered for ARDS:

- **HD of corticosteroids:** short-term therapy of methylprednisolone equivalent dosages from 250 to 500 mg/day during one or more consecutive days.
- **LD of corticosteroids:** methylprednisolone-equivalent dosages ranging from and including 0.7 to 1.3 mg/kg/day.

The decision of treatment with one dosage or another was exclusively at the discretion of the treating medical team, as evidence about the use of corticosteroids on COVID-19 was very low.

The primary endpoint – the mortality between HD and LD patients. Secondary endpoints included (i) a combined variable of need for mechanical or noninvasive MV and death and (ii) the development of severe ARDS, according to the Berlin Definition. Outcomes: A final admission outcome (discharge or death) was recorded in 177 out of 180 (98.4%) patients. Overall mortality after a median (IQR) of 16 (9–26) days of admission was 27.2% (n = 49) and was more in the HD cohort than in the LD group (42.6% vs 20.6%, respectively). The unadjusted logistic regression model showed a significantly higher death of patients with an ARDS receiving HD of corticosteroids compared with patients treated with LD (95% CI 1.43–5.69, p =0.007). After adjusting by gender, age-adjusted CCI, and SpO₂/FiO₂, the results remained similar. Though a shorter time from the first dose of corticosteroid to death (n = 31) was observed among HD (median [IQR] of 10 [5–19] days) compared with LD (median [IQR] of 13 [6–22] days), differences were not significant (p = 0.31). We further analyzed whether other causes different from ARDS could explain the effect over mortality, but the distribution of pulmonary embolism and bacterial infection (with or without sepsis) was similar between both groups. No significant differences between both groups were observed in the risk of developing a severe ARDS. We performed sensitivity analyses excluding patients hospitalized for no longer than 7 days or those treated with less than 5 days of corticosteroids, and all results remained practically unchanged. Results: In this large observational study performed at SPS Hospital’s intensive care unit, short-term high doses of corticosteroids, when compared with low doses, were associated with an increased mortality and a higher need for MV or death in hospitalized patients with a SARS-CoV-2 infection developing an ARDS.

Safety and Cost-effectiveness of No Prophylactic Platelet Transfusion Strategy in Dengue Patients with Severe Thrombocytopenia – A Retrospective Analysis

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Objectives: To analyze the safety, incidence of adverse events, and cost-effectiveness of no prophylactic platelet transfusion strategy in dengue fever. Materials and methods: We conducted a retrospective observational study among dengue patients who had platelet counts less than 20,000/mm³ admitted to our hospital between 2016 and 2021. This study was conducted in SKS Hospital and Postgraduate medical institute, a tertiary care teaching hospital in Tamil Nadu, south India. We used to transfuse platelets only if the patient developed bleeding manifestations or when insisted by the patient and family were due to apprehension. But, we usually land up transfusing patients due to the second reason. To bring down this apprehension, we adopted a strategy to have a formal educating/counseling session for patients and families regarding (i) the importance of fluid management and (ii) no purpose and adverse effects of prophylactic platelet transfusion. We repeated this session as and when needed throughout the hospital stay. Results: We had a total of 709 dengue patients admitted during the study period. Of these 709, 270(38.08%) patients who had the lowest platelet count below 20,000/mm³ were included in this analysis. In total, 174(24.5%) patients had the lowest platelet count between 10,000/mm³ and 20,000/mm³. Of these 174 patients, 8(4.5%) received prophylactic platelet transfusion, and 9(5.17%) received platelet transfusion due to bleeding manifestations. The total number of patients with the lowest platelet count below 10,000/mm³ was
96 (13.5%). Of these 96 patients, 13 (13.5%) received prophylactic platelet transfusion and 6 (6.2%) received platelet transfusion due to bleeding manifestations. We had four deaths in total. However, all those four were referred to us with severe hemocoagulation, hypovolemic shock, disseminated intravascular coagulation (DIC), and multiorgan dysfunction syndrome (MODS). In other words, among the patients who were admitted with us in an early stage and received appropriate fluids to maintain hematocrit did not develop severe bleeding manifestations or coagulopathy even when platelet counts dropped below 10,000/mm³. Though this study cannot compute the cost-effectiveness quantitatively, one could clearly see that we have reduced the healthcare cost spent by patients (cost of platelets and length of hospital stay), possibilities of adverse events related to transfusion, and burden on blood banks in times of endemic as well. The counseling/teaching session really worked and most of the patients, i.e., 86.6% of the patients (below 20,000/mm³) did not demand prophylactic transfusion. Conclusion: Imparting knowledge about the disease and management plan for any disease to the patients and family is of utmost importance – humanization. This is what we did here, which reduced the incidence of platelet transfusion and healthcare costs significantly in dengue patients – cost-effective. Even patients with platelet counts of 1000/mm³ do not need prophylactic platelet transfusion. The risk of bleeding in dengue fever does not rely on platelet counts. If at all bleeding occurs, it would be due to hemocoagulation and hypovolemia leading to MODS and DIC. Summing it up, maintaining hematocrit by appropriate fluids is the cornerstone in treating dengue patients.

A Case of Acute Pancreatitis with Visceral Artery Pseudoaneurysm

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Introduction: Severe acute pancreatitis is defined by single or multiple organ failure lasting more than 48 hours. Acute necrotizing pancreatitis is diagnosed when more than 30% of pancreatitis is affected. The course of acute pancreatitis in the ICU is long and is complicated by infection, pseudocyst, pseudoaneurysm, bleeding, etc. Visceral artery pseudoaneurysm is an uncommon complication of acute pancreatitis. Here, we present a case of acute necrotizing pancreatitis complicated by rupture of splenic artery pseudoaneurysm. History and Clinical Features: A 27-year-old gentleman presented with signs and symptoms of pancreatitis for 1 day. On admission, the patient was conscious, oriented, febrile, PR – 142/min, BP – 90/60 mm Hg with noradrenaline (10 µg/hour), SPO₂ – 98% in room air, and RR 36/min (APACHE score 2). The patient was electively intubated in the Emergency Department in view of hypotension and increased work of breathing. CT angiogram showed evidence of acute necrotizing pancreatitis with minimal peripancreatic collection, splenic vein thrombosis, and splenic infarct. Amylase lipase was 1038 and 2241. He was diagnosed as severe acute pancreatitis (Revised Atlanta classification). The secondary causes of pancreatitis were ruled out. Course in ICU: The patient developed severe ARDS and was managed with lung-protective ventilation and prone. He had multiple episodes of VAP and was treated with targeted antibiotics. Multiple abdominal drains were inserted to drain the abdominal collections in view of persistent fever and worsening abdominal distension. Cultures from the abdominal collection grew CRO Klebsiella and Proteus that were treated according to the sensitivity. He developed nonoliguric AKI and he was requiring intermittent vasopressor support. Tracheostomy was done in view of failed extubation and the need for prolonged ventilation. In the 7th week of admission, the patient had a drop in hemoglobin with worsening of hemodynamics and increased abdominal distension. CT angiogram showed a mid splenic artery aneurysm with contrast blush. Percutaneous coil embolization of the aneurysm was done. Blood products were transfused. The patient had recurrent febrile episodes and developed new-onset VAP for which targeted antibiotics were administered. The patient’s ventilator requirement gradually reduced and he was weaned-off the ventilator gradually. The tracheostomy tube was decannulated. He was hemodynamically stable and was transferred to the ward and discharged. Conclusion: Visceral artery pseudoaneurysm is an uncommon complication of acute pancreatitis. Various studies show incidence ranging from 4 to 15%. High degree of clinical suspicion is critical for early diagnosis and management.

References

A Rare Presentation of Japanese Encephalitis – Encephalitis with Flaccid Quadriplegia: A Case Report

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Introduction: Japanese encephalitis is endemic to tropical and sub-tropical Asia. It is usually asymptomatic or mild symptoms resolving in few days. Hospitalization is primarily due to neurological symptoms or respiratory involvement. Myelitis with flaccid paralysis is a rare presentation of Japanese encephalitis, which according to our literature search, was reported in 28 cases and only published as a case report or series. We report here a case of a 14 year-old female who developed encephalitis and myelitis with flaccid paralysis. Case report: A 14-year-old school going girl presented to the Emergency Department with high fever (40°C), headache, and altered sensorium (GCS-10). Investigation and CSF analysis pointed in probable viral encephalitis, whereupon acyclovir therapy was initiated. No improvement was seen and she developed quadriaparesis with respiratory involvement. Immunoglobulin therapy and mechanical ventilation were started. Extensive investigation showed positive for JEV-PCR from CSF and serum. She was managed extensively in our intensive care unit for 117 days tracheostomized on a ventilator. She was shifted to a high-dependency unit (HDU) for further rehabilitation. Discussion: In our patient diagnosis of JE was confirmed based on PCR-JE for CSF and serum, which is considered confirmatory for JE diagnosis by WHO. In the literature search, we only found 28 cases with such presentation, and in that also, only a single case with encephalitis followed by flaccid paralysis, which goes...
in line with the clinical findings in our patient. This underreporting may be due to confusion in diagnosis with poliomyelitis. The diagnosis of anterior horn pathology has been established clinically or electrophysiologically in most cases. In our case, electroneurographic and the corresponding MRI results confirmed a motor neuron involvement as the correlate of a poliomyelitis-like syndrome, which followed the initial encephalitic stage. In only eight cases, spinal MRI has been conducted (images available in two cases) with five cases showing correlates in the anterior horn. In a later MRI follow-up of our patient, anterior horn pathology was not visible anymore despite clinical and electrophysiologic proof. The lack of typical MRI signs in the three mentioned case reports may be due to imaging at a later stage of the disease. Most published cases have occurred more than 20 years back with the reduced availability of advanced medical imaging in endemic countries.

Conclusion: We think this lower incidence of such life-threatening presentation of JE is due to under reporting. Currently, JE vaccination is under the National Vaccination Programme, but we need to be more aggressive like polio eradication program.

References

Tenofovir-induced Hypokalemic Paralysis – A Rare Adverse Effect of Antiretroviral Therapy with Tenofovir

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Introduction: Acute onset of proximal limb weakness has many etiologies. Some common causes of proximal limb weakness include Guillain–Barre syndrome, severe hypokalemia, hypercalcemia, thyroid disease myopathy, severe vitamin-D deficiency, botulism, snake bite, etc. HIV drug-related myopathy has been reported in the literature. We describe an interesting case of acute proximal muscle weakness due to severe hypokalemia secondary to tenofovir-induced proximal renal tubular acidosis. Case report: A 54-year-male, a known HIV-positive patient on ART (dolutegravir, lamivudine, and tenofovir) was referred to ICU because of proximal muscle weakness since 1 day. Weakness started in proximal upper limbs and progressed rapidly within a day to involve both lower limbs with the inability to stand unassisted. Considering acute onset, all relevant investigations were done. He had low levels of serum potassium (1.9), a CPK level of 229, and nerve conduction velocity study showed bilateral asymmetric proximal axonal poly radiculoneuropathy involving all four limbs. In order to find the cause of severe hypokalemia, we investigated him further. Urine analysis showed pH of 6, serum phosphate was low (1.71), and serum magnesium was low (1.2) as well with high serum creatinine (2.09). He also had severe metabolic acidosis without any history of diarrhea or severe hypotension. These findings were consistent with proximal tubular acidosis. We started aggressive potassium replacement through the central line along with bicarbonate replacement and his weakness improved as potassium levels were normalized. He was able to stand by the next day as there was no proximal muscle weakness. In this case, tenofovir-induced proximal renal tubular acidosis leads to severe metabolic acidosis with hypokalemia. Discussion: Myopathy is one of the neurological manifestations of HIV, which is caused as a consequence of HIV itself or it may result from medicines used to control HIV. Tenofovir is used as a part of the ART regimen for HIV, and it is predominantly secreted from the proximal renal tubule via multi-drug-resistant protein 2. Tenofovir thus causes proximal tubular acidosis that can lead to severe hypokalemia and result in muscle weakness. Conclusion: Tenofovir is rarely associated with proximal renal tubular acidosis. All HIV patients being treated with tenofovir should check serum potassium levels regularly. Keywords: Hypokalemia, Proximal tubular acidosis, Tenofovir.

A Rare Complication Seen Post Dengue Fever – Hemophagocytic Lymphohistiocytosis

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Introduction: Secondary hemophagocytic lymphohistiocytosis (HLH) has a noticeable link with a variety of microbial infections. The most probable cause is inappropriate stimulation of macrophages in the bone marrow, causing phagocytosis of blood cells with the production of high amounts of proinflammatory cytokines. Many viral infections have been implicated to have association with HLH. We describe here a 14-year-old boy who had HLH associated with dengue virus infection. Case report: A 14-year-old boy, previously healthy boy, presented with persistent fever, headache, and redness bilaterally over the cheek, lower limb, and abdomen post dengue fever. There was clinical deterioration during empiric antibiotic and symptomatic therapy. Bone marrow examination demonstrated the presence of hemophagocytosis. Diagnosis of dengue fever with virus-associated hemophagocytic syndrome was made according to the diagnostic criteria of the HLH 2004 protocol of the Histiocyte Society. The patient recovered with corticosteroid therapy and symptomatic management. Discussion: A review of the literature revealed only a handful of case reports that showed evidence that this syndrome is caused by the dengue virus. Our patient is an interesting case of a hemophagocytic syndrome associated with classic dengue fever and contributes an additional case to the existing literature on this topic. Hemophagocytic lymphohistiocytosis is a rare, life-threatening disorder characterized by tissue destruction due to abnormal immune activation. Afflicted patients present with fever and multiorgan dysfunction, which is often mistaken for sepsis. Although primary HLH is typically seen in the pediatric age group, secondary HLH can occur in...
adults and children in association with certain triggers. Common triggers for secondary HLH include infections, solid organ malignancies, lymphoid or myeloid, rheumatological disorders, and inherited or acquired immunodeficiency. Infectious triggers are usually viral, and Epstein–Barr virus has been most implicated. Hemophagocytic lymphohistiocytosis can also occur in the setting of Cytomegalovirus, Parvovirus B19, HIV, tuberculosis, bacterial, fungal, and parasitic infections. This case highlights the need for increased awareness even in infections not typically associated with hemophagocytic syndrome.

References

Meliodosis in Medical Intensive Care Unit – A 10-year Review
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Objectives
- To study the clinical characteristics and outcomes of patients admitted with melioidosis in the Medical Intensive Care Unit (mICU).
- To study the factors contributing to mortality in ICU patients with severe melioidosis.

Materials and methods: This is a retrospective study over a period of 10 years between August 2012 and August 2022. All patients admitted in the Medical Intensive Care Unit, medical high-dependency unit, were screened from the database and patients with melioidosis were included in the study. Results: A total of 13 patients were admitted in the mICU during the 10-year period. The mean age of presentation was 40.5 years with male predominance (93%). The most common risk factor is uncontrolled diabetes mellitus (70%) with a mean glycosylated hemoglobin of 10.9%. All patients presented with fever (100%) and majority of them had bacteremia (92%). The mean APACHE score was 16.9, and the predicted death rate was 27.5. The mortality was 47%, and the relapse was 14% among survivors. A comparison was done among the survivors and nonsurvivors who were admitted into the mICU. The nonsurvivors were relatively older with higher glycosylated hemoglobin and were directly admitted into the ICU, and the duration of illness prior to presentation was shorter than the survivors. The nonsurvivors had more organ involvement, with higher acute kidney injury, liver dysfunction, and shock. The procalcitonin levels and APACHE scores were higher in the nonsurvivor group. Complications like gastrointestinal bleeding, pneumothorax, nosocomial bacteremia, and secondary hemophagocytic lymphohistiocytosis are seen among the nonsurvivors. Conclusion: Severe melioidosis requiring intensive care is a devastating illness with a high mortality rate. Patients are usually male with uncontrolled diabetes mellitus, bacteremic, and have multiorgan involvement. Nonsurvivors had multiorgan involvement requiring organ support and had more complications when compared with survivors.
Costing Estimation in Medical Intensive Care Unit – A Cross-sectional Study  
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DOI: 10.5005/jp-journals-10071-24411.14  

Objectives: 
• To calculate the running cost of medical ICU bed per patient per day.  
• To compare the actual cost derived with the current tariff offered to the patient.  

Materials and methods:  
Christian Medical College, Vellore, is a renowned tertiary care center in the South Indian state of Tamil Nadu. The Medical ICU in CMC Vellore consists of 3 ICU areas – MICU, MHDU, and STICU. This study pertains to the beds in MICU (12 beds), MHDU (12 beds), and STICU (14 beds), total 38 beds. Study period: one year, 2021–2022. This is a cross-sectional study done with assistance from quality management cell and various other departments of the hospital. All data collection were retrospective. The various particulars of ICU cost were broken down under distinct headings as a means to get the actual expenses on the floor for each. Human resource cost-related data were collected directly from accounts department. Cost analysis was performed using both microcosting and macrocosting approach that focused on the estimation of nominal or actual cost per ICU patient per day. Data were derived from the daily indents and annual records of resources consumed in the ICU unit under study and from hospital balance sheets with the accounts department. Results: The major share of cost in running the ICU is CTC for staff, which is 56% followed by consumables and equipment accounting to 18% followed by Institutional overheads, IT supports, and accounts contributing to 11%. The calculated average cost per bed per day is Rs. 18,368 (223 USD) and the actual bed charges per day for MICU and STICU is Rs. 13,015 (158 USD) and MHDU is Rs. 6940 (84 USD). Conclusion: The actual cost of running MICU and STICU in CMC Vellore is 1.4 times the current tariff. The actual cost of running MHDU in CMC Vellore is 2.5 times the current tariff. The CTC for staff constitutes the major share of the cost in running the ICU (56%). The other major expenses in our ICU are consumables (18%) followed by institutional overheads (11%).

Results:  

<table>
<thead>
<tr>
<th>Total 44 patients</th>
<th>ON</th>
<th>INV</th>
<th>Better</th>
<th>EXP’D</th>
<th>HFNC</th>
<th>Better</th>
<th>Expired</th>
<th>HFNC–NIV</th>
<th>Better</th>
<th>Expired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 5 days</td>
<td>05</td>
<td>4</td>
<td>1</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td>9</td>
<td>06</td>
<td>03</td>
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<td>6–15 days</td>
<td>06</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>08</td>
<td>03</td>
<td>05</td>
<td></td>
</tr>
<tr>
<td>16–30 and more days</td>
<td>03</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>11</td>
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<td>13</td>
<td>09</td>
<td>04</td>
<td>17</td>
<td>09</td>
<td>08</td>
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</tr>
</tbody>
</table>
Role of Cardiac and Lung Ultrasonography in Predicting Weaning Failure in Patients of Acute Kidney Injury Requiring Mechanical Ventilation

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Objective: This study was conducted as a prospective, observational, single-arm, single-center clinical study. The main objective of this clinical study was to predict the adequacy of optimization before spontaneous breathing trial (SBT) by using noninvasive evaluation of the patient using transthoracic echocardiography (TTE) and lung ultrasonography (LUS) and further preventing the stress of pre-mature weaning attempt in acute kidney injury (AKI) patients requiring mechanical ventilation (MV). Primary objective: The main objective of this clinical study was to evaluate the efficacy of TTE and LUS in predicting weaning or extubation failure in AKI patients requiring MV. Secondary objective: The secondary objective of this clinical study was to determine if LUS alone can identify AKI patients requiring MV who are at a higher risk of weaning or extubation failure. Materials and methods: This study was conducted as a prospective, observational, single-arm, single-center clinical study. The weaning was conducted following the standard ICU protocol. The SBT was performed under MV with pressure support of ≤7 cm H₂O and PEEP ≤5 cm H₂O or by using a T-piece. LUS examination and TTE study were performed within 24 hours preceding SBT and after 2 hours of initiation of the SBT. The physician in-charge decided to extubate, to stop SBT, or to continue MV in accordance with the standard ICU protocol independent of the investigators’ findings. The failure of SBT was termed weaning failure. Any need of reintubation, need of noninvasive ventilation, or death within 48 hours of extubation was termed as extubation failure. Results: A total of 32 patients were enrolled in the study to match the sample size. About 15 patients were weaned successfully, whereas 17 patients failed SBT. Out of the 17, 13 suffered weaning failure after SBT, whereas 4 patients had an extubation failure. Multivariate models to predict the weaning outcome of the patients were created. A model-fit analysis was done. The variables were divided into base variables that were considered common in all the logistic models and alternate variables that were used to define models. The model considering changes in global lung aeration induced by an SBT trial was associated with a higher Youden index of 0.691. It also showed a significant p-value of 0.017 associated with the change in global lung aeration induced by the SBT. Conclusion: Weaning failure in AKI patients can be predicted by:

- A high B-line quantification in LUS at the end of a 2-hour SBT.
- An increased difference between the global LUS scores before and at the end of a 2-hour SBT.
- An increased difference between the anterior LUS scores before and at the end of a 2-hour SBT.
- A restrictive pattern of LV diastolic filling at the end of a 2-hour SBT.
- A high fluid balance on the day of weaning.
- A poor SOFA score on the day of weaning.
- High LV diastolic filling pressure at the end of a 2-hour SBT alone cannot predict weaning failure and is not always associated with WIPO in AKI patients.

Evaluating Precipitating Factor for Adverse Event during Transport Despite Maintaining Standard-of-Care and Protocols during Transport

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Introduction: Prospective observational data of all the ventilated patients who need to be transported outside the ICU for investigation or procedural purposes. The aim was to observe any adverse event during transport, and diagnose any precipitating/preventable factors contributing to it. Objective: Evaluating the precipitating factor for adverse events during transport, despite maintaining standard of care and protocols during transport. Materials and methods: Demographical data, total no. of patients who transported outside in the form of invasive NIV also observed any adverse event during transport and the nature of complication. All ICU patients transported outside during the period from Jan 2022 to Sep 22 were observed and included. Result: Total no. of patients in the ICU on VENTILATOR/NIV/HFNC – 1279. Patients who required transportation out of ICU: 149: CT – 115. MRI – 21. DSA – 07. CATH LAB – 06. We have documented month-wise data of total no. of patients, no. of patients’ transport out of the ICU in that month, the support system with the disease category, the gender, and time of the transport (7 am to 11 pm, 11 pm to 7 am night shift). The actual time taken for the transport (less than 1 hour or more than 1 hour). The seniority of the technician, doctor, and nurse (less than 1 year – jr. more than one year – sr.) accompanying the patients. Also, we observed the nature of the adverse event with respect to disease categories. We have also documented the mode with which patients were transported (like dedicated bipap/existing in-use ventilator (or other)). Conclusion: No major adverse event has been observed where the procedure/investigation had to be abandoned and patients were needed to be transferred back to ice. No accidental airway events (displacement, dislodgement). In 13 patients, the change in heart rate was noted, desaturation episode found in 8 patients, also we noticed 11 technical alarms [event associated with monitor and ventilator (false alarm, inappropriate setting)]. One patient who was extremely critical had CPR in the ICU but was shifted in emergency to DSA and later expired. The cause of deterioration was related to her critical condition and primary diagnosis (pulmonary embolism with shock). Discussion: Mechanical ventilation of the critically ill patient is best practiced in the safe confines of the intensive care unit (ICU). Transport of ventilated patients, however, remains a frequent challenge. Successful transport requires effective communication,
Objectives: Wein Klin
Percutaneous tracheostomy has become an
advanced diagnostic and therapeutic procedure. This study aimed to evaluate the outcomes of tracheostomy in critically ill patients and the nature of complications.


Results: Post-tracheostomy decannulation complications can occur after 24 hours and post 24 hours of decannulation associated with post decannulation and mortality within the ICU. We have documented complications associated with post decannulation and mortality within the first 24 hours and post 24 hours of decannulation.

Materials and methods: A retrospective analysis of a tracheostomy-decannulated patient in a 43-bedded mix patient population ICU of a tertiary care hospital, Mumbai. Total number of patients treated in the ICU form of invasive ventilation 1961, out of which precut tracheostomy was performed on 86 patients who were treated in the ICU. Total number of patients treated with invasive ventilation patients in the ICU are 917.

Conclusion: Post-tracheostomy decannulation complication is not high in our ICU within 24 hours, but post 24 hours, decannulation complications were found to be significant in 1 week. And morbidity was 20.6% per 63 patients. Mortality is 4.7% per 63 patients.

References

Retrospective Analysis of Complications of Post-Tracheostomy Decannulation in Chronically Ill Patient in Intensive Care Unit
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Introduction: Percutaneous tracheostomy has become an established procedure done for prolonged invasive mechanical ventilation patients in the ICU. It offers a number of potential benefits such as better ventilation synchrony, less sedation requirement, weaning, communication, and improves patient compliance with the ventilator. We have documented complications associated with post decannulation and mortality within the first 24 hours and post 24 hours of decannulation.

Objective: Post-tracheostomy decannulation complications can occur after 24 hours.

Materials and methods: A retrospective analysis of a tracheostomy-decannulated patient in a 43-bedded mix patient population ICU of a tertiary care hospital, Mumbai. Total number of patients treated in the ICU form of invasive ventilation 1961, out of which precut tracheostomy was performed on 86 patients who were treated in the ICU.

Demographical data, total no. of patients who were treated with HFNC, 2 got better, one was DNI that got expired, and one after better output from HFNC who had respiratory inefficiency (drowsy and high CO2) got intubated for 2 days better and extubated to HFNC since NIV is contraindicated, recannulated within a week and get DAMA T/O. One who was treated with HFNC–NIV got tracheostomy recannulated within 4 days and then better T/O.

Conclusion: Post-tracheostomy decannulation complication is not high in our ICU within 24 hours, but post 24 hours, decannulation complications were found to be significant in 1 week. And morbidity was 20.6% per 63 patients. Mortality is 4.7% per 63 patients.

References

Postextubation Efficacy of HFNC and Intermittent HFNC Plus NIV in Noncardiac ARF Patients
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Introduction: Noninvasive ventilation is commonly used as standard therapy in the ICU in acute respiratory failure patients with excessive work of breathing (high RR >30 bpm, SpO2 <90%). High tidal volume, aerophagia, and gastric distention are common during NIV use and can worsen the respiratory failure. Objective: To document the efficacy of HFNC vs intermittent HFNC–NIV combination to prevent intubation in acute respiratory failure patients in a mixed patient population ICU and subsequent mortality.

Materials and methods: Prospective observational data were collected from a mixed patient population from 43 bedded ICU of a tertiary care hospital in Mumbai from Jan 2021 to Sep 2022.

Cardiac surgery patients are excluded from the study.

General medical, neuro, and immunocompromised patients having respiratory problems were included.

Results:
- Total number of patients treated with invasive ventilation (general patient population) are 917.
- Patient treated with HFNC is found in 61 patients and require subsequent intubation.
- Out of 61 patients who had failed HFNC and required intubation, 15 survived and 46 had expired.
- Average duration of HFNC was 5–10 days.
- Five patients treated with HFNC are discharged against medical advice.
- Patients treated with HFNC–NIV – 32
- Thirty-two patients are treated with HFNC and NIV intermittently and got intubated.
- About 13 patients got better, and 19 expired.
Mortality was higher in patients treated with HFNC alone vs HFNC + NIV combination. Early intervention, patient selection criteria, and clinical judgment have to be assessed in HFNC failure patients. Discussion: HFNC is still not found effective in hypercapnic and more severe diseases with sepsis or ALI, patients, compliance does seem to be improved with HFNC morbidity, and mortality is high in severe diseases patients with sepsis origin.

References

Bedside Examination – A Forgotten Art in Modern Day ICU
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Introduction: During the recent times of COVID, ICUs around the world have seen a sudden massive rise in patients. In low- and middle-income countries, this has led to chaos in the ICUs as the already inadequate staff has been bombarded with the sudden rise of critically ill patients. During such times, the forgotten art of bedside examination with the use of simple noninvasive intervention has come to rescue of the physicians. We look forward to presenting our study of one such noninvasive measure called the ROX index, which has served to triage the patients as per their disease severity and help the treating physician to concentrate more on the moderate- and high-risk patients.

Aims and objectives:
- To study the role of ROX index.
- To study the efficacy of ROX index as rescue alarm system to triage critical patients.

Methodology: About 500 patients admitted to our hospital were retrospectively studied. Age, gender, ROX index on admission and every 2 hours, 6 hours, 12 hours need for mechanical ventilation (NIV and invasive mechanical ventilation), hospital length of stay, and mortality were studied. Pearson’s correlation analysis was performed to determine the impact of ROX index measures to the need for mechanical ventilation, hospital length of stay, and mortality. Sample size: In total, 500 patients admitted with the diagnosis of ARDS or ALI. Duration of study: 9 months.

Inclusion criteria:
- Patients aged 18 years and above.
- Patients with diagnosis of ARDS/ALI.
- Patients with GCS 13 and above.
- Patients requiring supplementary oxygen.
- Patients willing to consent.

Exclusion criteria:
- Patients unable to consent.
- Patients on LTOT.

Case Report of Unusual Presentation of Acute Pancreatitis with Undiagnosed Type-1 Diabetes Mellitus in a Young Male
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DOI: 10.5005/jp-journals-10071-24411.21

Introduction: The most common etiology of acute pancreatitis is gallstones and alcohol consumption. The other causes being hypertriglyceridemia, hypercalcemia, post ERCP, and congenital. Hypertriglyceridemia results from sedentary lifestyle, familial, metabolic syndromes, and drug induced. Type-1 diabetes mellitus is a rare cause of hypertriglyceridemia. Reports of type-1 diabetes...
mellitus with acute pancreatitis in the absence of any other etiology are uncommon. We report one such rare case of undiagnosed type-1 diabetes mellitus with acute pancreatitis. Case report: A 26-year-old male was admitted with severe acute abdominal pain, nausea, and vomiting to another hospital, where he was diagnosed as acute pancreatitis. He had raised amylase, lipase, and ultrasound findings as well as CT findings consistent with pancreatitis. He was shifted to our center for further management because of hypotensive shock and increasing breathlessness. Because of polyuria despite of being on isotropic support for hypotension, urine examination was done, which showed a large amount of glucose. This leads us to do workup for DKA because of severe metabolic acidosis with lactate in the normal range (ABG: pH of 7.04, HCO₃ 3.2, lactate 1.0, and serum ketone 16.7). The patient was diagnosed as a case of type-1 diabetes mellitus based on urine and blood investigations. Insulin therapy was started as per the protocol of DKA and patient started improving. For pancreatitis, the cause was found to be hypertriglyceridermia (serum triglyceride: 1772). Further investigation was done for DKA that showed HbAIC of 14.90. C-peptide levels were low (0.280), which lead to diagnosis of type-1 diabetes mellitus. Triglyceride levels improved by the next day. Oral fluids were started and the patient was shifted back to the ward. Pancreatitis management was continued as per standard protocol. Discussion: Type-1 diabetes mellitus is associated with high triglyceride levels that can lead to acute pancreatitis. Type-1 diabetes mellitus-induced hypertriglyceridermia should be considered as differential diagnosis in patients of acute pancreatitis with elevated blood sugar and triglycerides when other etiologies have been ruled out. Conclusion: The patient in this case report had undiagnosed type-1 diabetes mellitus that led to hypertriglyceridermia that caused pancreatitis. Keywords: Acute pancreatitis, Hypertriglyceridermia, Type 1 diabetes mellitus.

Dynamic Change in CLIF-SOFA, MELD-Sodium, and MELD Score in Predicting Postoperative 28-day Morbidity and Mortality in Patients Undergoing Live Donor Liver Transplantation: A Retrospective Study

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DOI: 10.5005/jp-journals-10071-24411.22

Introduction: Liver transplant is the definitive treatment option for end-stage liver disease. Various scoring systems have been incorporated in determining the severity of liver disease and predicting post-transplant outcome. Postoperative values of disease severity scores are expected to reflect post-transplant improvement of disease and patient outcome. Studies comparing early dynamic change in severity scores are very few. Objectives: To compare the dynamic changes in CLIF-SOFA, MELD-Na, and MELD scores in patients undergoing live donor liver transplantation. Material and methods: A retrospective study was conducted after approval of the Institutional Ethical Committee. Data were collected retrospectively for all adult patients undergoing LDLT over one-and-a-half year (July 2018–December 2019). Patients with liver transplantation due to ALF were excluded. Demographic data, clinical diagnosis, and intraoperative parameters were noted. Postoperative data included serum creatinine, bilirubin, INR, serum sodium, PaO₂, FiO₂, and vasopressor support. Postoperative 28-day outcome and final outcome were noted. Postoperative events included sepsis, AKI, vasopressor initiation, graft dysfunction, and requirement of RRT. MELD, MELD-Sodium (Na), and CLIF-SOFA scores were calculated using standard formulae. Vasopressor support and renal replacement therapy were taken into consideration according to the CLIF-SOFA scoring system, and the final CLIF-SOFA score was calculated as the sum of all six organ system scores. All these three scores were calculated on preoperative day, on postoperative day 1, day 4, and day 7. Delta scores were calculated as the difference between preoperative score and score on that postoperative day, as follows:

- d-Meld.1 = Meld.preop – Meld.POD1
- d-Meld.4 = Meld.preop – Meld.POD4
- d-Meld.7 = Meld.preop – Meld.POD7
- d-MELD.Na.1 = MELD.Na.preop – MELD.Na.POD1
- d-MELD.Na.4 = MELD.Na.preop – MELD.Na.POD4
- d-MELD.Na.7 = MELD.Na.preop – MELD.Na.POD7
- d-CLIF SOFA.1 = CLIF-SOFA.preop – CLIF SOFA.POD1
- d-CLIF SOFA.4 = CLIF-SOFA.preop – CLIF SOFA.POD4
- d-CLIF SOFA.7 = CLIF-SOFA.preop – CLIF SOFA.POD7

Data were analyzed using SPSS Software version 22. The comparison between categorical data was done by Chi-square test, whereas comparison between continuous data was done using Mann–Whitney U test. Logistic regression analysis was done with all the scores and delta scores for outcome. ROC curve analysis was done for all the scores. An adjusted p-value of <0.05 was considered significant statistically. Results: In total, 100 out of 117 patients met the inclusion criteria. Our study population shows in-hospital mortality of 13% and postoperative day-28 mortality of 7%. The incidence of sepsis was found to be 35%. About 48% of our patients developed AKI and 11% required RRT. Nonsurvivors had a significant rise in MELD, MELD-Na, and CLIF-SOFA scores on postoperative day 7. The scores on postoperative day 7 were significantly higher in those patients who developed sepsis, AKI, and needed RRT within postoperative 28 days. Strong association was found among d-MELD-Na and d-CLIF-SOFA scores on postoperative day 1, day 4, and day 7. Among the delta scores, d-CLIF-SOFA score on postoperative day 7 was found to be the strongest predictor of outcome. Conclusion: Dynamic change in CLIF-SOFA score on postoperative day 7 was found to be the best predictor of outcome, followed by d-CLIF-SOFA on postoperative day 4 and d-MELD-Na on postoperative day 7.

Needs and Expectations of the Relatives of Patients Admitted in the Intensive Care Units of South India: A Multicenter Cross-sectional Descriptive Study

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Introduction: Intensive care unit (ICU) admission of the member of a family is a stressful event in the lives of relatives. In these vulnerable
periods, the needs and expectations of the relatives of patients admitted in the ICUs are often overlooked. **Objectives:** To assess the fulfillment of needs and expectations of the relatives of the ICU-admitted patients of South India. **Methods:** This cross-sectional descriptive study involved two large tertiary care hospitals of South India, comprising of both government and private healthcare institutions. **Results:** It is found that the needs and expectations of the relatives of patients admitted to the ICUs are overlooked in both government and private healthcare setups. The major domains of unfulfillment of the expectations that raised concerns in the relatives were of effective communication regarding the status of the patient and the prognosis, inadequate explanations of the medical jargon used, inadequate involvement in the shared and informed decision-making process, lack of help in the financial planning for the treatment, etc. It is also found that literacy level, education attained, social support, financial status, etc., of the relatives played important roles in the needs and expectations of the population. There were no significant variations or deviations in the results attained from government and private healthcare setups. **Discussions:** It is also the duty of the healthcare team to address the needs and expectations of the relatives of patients admitted in the ICUs to enhance in the collective efforts of patient care. It will increase compliance, reduces disputes creating a well-sustained patient-centered healthcare ecosystem.

**Severe Gram-negative Sepsis During Guselkumab Treatment for Psoriasis – A Case Report**

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**Introduction:** Psoriasis is a frequent chronic inflammatory skin disease whose key pathological manifestations are inflammation, hyperproliferation of the epidermis, and vascular alteration. A newer therapeutic option for psoriasis is guselkumab, a high-affinity inhibitor of the p19 subunit of IL-23. Here, we report a case of severe, Gram-negative infection associated with guselkumab. **Case:** A 42-year-old female with a history of generalized pustular psoriasis was admitted to the ICU in severe condition during treatment with guselkumab. Treatment with guselkumab was started 3 months before this admission and was administered according to the label (100 mg at weeks 0 and 4 and every 8 weeks thereafter). On admission, the patient was hemodynamically unstable (arterial blood pressure 60/40 mm Hg). Norepinephrine, vasopressin, and hydrocortisone were introduced. Laboratory analysis revealed a leukocytosis of 25.9 x 10⁹ cells/l, a reduced platelet count of 74 x 10⁹ cells/l, a C-reactive protein level of 374 mg/l, a procalcitonin of 8.1 ng/ml, a blood urea nitrogen of 13.1 mg/dL, and a serum creatinine of 271 mg/dL. On the second day of hospitalization in the ICU, urine and blood cultures revealed the Gram-negative organism *Proteus mirabilis*. Empiric antibiotic therapy started with intravenous meropenem and vancomycin, later intravenous fosfomycin was added. She was submitted to continuous renal replacement therapy with the hemoadsorption. In few days, the patient became hemodynamically stable and gradually was weaned from intensive therapy. **Conclusion:** According to VOYAGE-2 trial, three serious infections were observed in the active treatment group (bronchitis, erysipelas, and soft tissue infection); and one serious infection was noticed in the maintenance group (appendicitis). In the ECLIPSE trial, investigators reported six serious infections in guselkumab-treated patients. This is the first report of a severe *Proteus mirabilis* infection in a patient receiving guselkumab.

**References**


2. Langley R. Guselkumab demonstrates superior long-term responses to secukinumab at Week48 in the treatment of moderate to severe psoriasis: Results from the ECLIPSE trial. 3rd Inflammatory Skin Disease Summit; Vienna, Austria; 2018.

**Serum Neopterin Levels in Differentiating MODS in Patients with Sepsis**

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**Objective:** To investigate serum neopterin as a biomarker in differentiating MODS in patients with sepsis at 48 hours. **Materials and methods:** The study was conducted in Amrita Institute of Medical Sciences. It was a case–control study. The patients were classified into two groups, i.e., sepsis with MODS and sepsis without MODS. The demographic data were collected. At 0 and 48 hours, CBC, CRP, procalcitonin, ESR, and serum neopterin were checked and the results were analyzed. Serum neopterin levels were analyzed by the enzyme-linked immunosorbent assay (ELISA). **Results:** In sepsis with MODS, there were 22 patients, and in sepsis without MODS, there were 17 patients. The mean age of the patients

![Fig. 1: The median neopterin levels between sepsis with MODS and sepsis without MODS](image)
Evaluation of Serum Electrolyte Imbalance in Traumatic Brain Injury Patients

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INTRODUCTION: Traumatic brain injuries (TBI) are a major public health problem and devasting condition, with significant mortality and morbidity. Electrolyte imbalance after resuscitation in TBI patients is common and further aggravate this condition. Aim: We evaluate the electrolyte derangement in traumatic brain injury patients 24 hours after resuscitation. Methods: After Institutional Ethical Approval and written informed consent, 109 TBI patients meeting the inclusion criteria were included in this prospective observational study. Serum electrolytes (serum sodium, potassium, and calcium) were measured at the time of admission and 24 hours after resuscitation. All patients received standard treatment according to the institutional protocol for TBI patients. Results: A total of 109 patients were included in this study. Hypernatremia (30.0%) is the most common electrolyte abnormality followed by hyponatremia (25.2%), hypokalemia (21.2%), hyperkalemia (17.3%), and hypocalcemia (6.3%) within the first 24 hours after resuscitation. Conclusion: Electrolyte imbalance following traumatic head injury is an important cause to look for in patient monitoring. Sodium is the chief electrolyte of concern. Serum potassium and calcium levels also undergo notable changes. Based on CT scan findings, several TBI associated with various electrolyte derangements are of important concern, especially within the first 24 hours after resuscitation. Keywords: Serum electrolytes, Traumatic brain injury.

Tracheal Tube Cuff Pressure – Rigidly Constant or Directionally Variable

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INTRODUCTION: More often than not in an ICU setting, the tracheal tube cuff is inflated and forgotten until it has to be removed, despite the known fact that failure to maintain the ideal range of the cuff pressure can lead to many complications. An excess cuff pressure may lead to subglottic ulcer, hoarseness of voice, nerve damage, ischemic damage to the tracheal wall, stenosis, and tracheal fistula, while an inadequate seal can lead to microaspiration causing the patient to suffer from ventilator-associated pneumonia (VAP). There ought to be a myriad of factors that could alter the CP over time that could lead to the complications caused by overinflation or underinflation of the cuff. Though literature mentions measuring of tracheal tube CP, it is mostly done normally with analog manometers. This carries an innate inclination toward biases such as observer and interobserver biases. In this study, therefore, an electronic digital manometer was used to increase the accuracy of the readings and to verify the facts in an ICU setting. Aims and objectives: To evaluate any change in tracheal tube cuff pressure with change in position, mode of ventilation, and time in ICU patients. Materials and methods: After obtaining Ethics Committee Approval, a prospective observational study was conducted on 70 age- and sex-matched intubated patients in an ICU setup. The tracheal tube CP was measured initially with an electronic digital manometer (AG Cuffill). Thereafter, the measurement was taken every 2 hours for 8 hours. Any change in position, mode of ventilation, and time was serially observed. Results: Out of a total of 70 patients, 10 were dropouts due to various factors. It was found that with a change in position from supine to propped up, there was an average decrease of 4.6 cm H₂O in 83.3% patients. On the contrary, in 16.7%, there was an increase of 2.6 cm H₂O. It was also observed that with a change in ventilation from spontaneous to mechanical, there was a decrease of 5.4 cm H₂O in 76.7% patients. While in 23.3%, there was an increase of 2.6 cm H₂O. Also, with time, there was a decrease of 5.6 cm H₂O in 83.3% of patients while an increase of 0.5 cm H₂O in 16.7%. Discussion: Gradual changes in CP can only be measured accurately over a prolonged period of time like in an ICU setting. Therefore, this study has a distinct advantage over the previous ones that have been carried out in intraoperative intubated patients for a short duration combined with the uniqueness of the studied parameters. Literature is deficient about CP performance in critically ill patients in the ICU with a lengthy stay. Conclusion: There is change in CP with the mode of ventilation, position, and duration. This study is the first of
its kind to address whether tracheal tube CP changes with position, mode of ventilation, and duration.

References

Intubations – From Nowhere to Somewhere and From Somewhere to Digital: A Simulation Study
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Introduction: Earlier tracheal tubes were not used at all, it was only the mask that was used for the purpose. And then came the cuffed tubes. While the cuffs provided an added layer of safety and sophistication, along with their advantages, they also brought their perils. Aims and objectives: To evaluate the magnitude of cuff pressure achieved in intubations performed by informed vs noninformed trainees in a human simulator. Materials and methods: A review of 600 intubations was done in a human simulator mannequin (Kyoto Kagaku, Japan) with digital cuff-pressure manometer (AG Cufffill). Group I included 200 trainees (residents, nurses) who were allowed to intubate the mannequin blinded to the automated cuff volume shown on mannequin. Another observer measured the cuff pressure blinded to the performer. Group II included the same 200 trainees after debriefing of intubation who performed intubation without blinding to the automated volume measurement but blinded to the cuff pressure. Group III included the same 200 trainees unblinded to both volume and pressure.

Results: In group I, in 92% readings, there was an extreme variation in both volume (72%) and pressure (96%) from the expected optimal baseline. After debriefing in group II, the variation in volume was 23%, while in pressure, it was 84% from the expected optimal baseline. In group III, the variation was 20% in volume and 6% in pressure from the expected optimal baseline. Discussion: There can be various factors leading to different intubating conditions such as material of the tube, material of cuff, size of the tube, and performer observation variation, which might directly affect the effective cuff volume. A few previous studies have used manual cuff manometer, however, the use of a digital manometer can reduce the observer error and increase the accuracy. At the same time, the use of simulator avoids human complications and ethical issues. Conclusion: Uninformed trainees had a tendency to error on both the volume and pressure of the ET tube. After debriefing, though the skill improved and there was a significant improvement in volume error, optimal pressure could still not be reached. However, with precise measurement of pressure, the errors significantly came down to a minimum. A pressure-guided approach toward ET tube cuff inflation seems to be more accurate and overcome the various factors leading to variations in intubating conditions.

References

Bronchoscopy in COVID-19 ARDS Patients: Diagnostic and Therapeutic Implications
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Objectives: Primary: To analyze the LRT samples obtained by bronchoscopy with a focus on the microbiological, cellular, and cytological aspects in mechanically ventilated COVID-ARDS (C-ARDS) patients. To assess the change in treatment based on bronchoscopic evaluation in mechanically ventilated COVID-ARDS (C-ARDS) patients. Secondary: To describe the safety aspects of bronchoscopy in mechanically ventilated COVID-ARDS (C-ARDS) patients and hospital personnel. Materials and methods: The study design was a retrospective–prospective observational study among mechanically ventilated COVID-19 ARDS patients. Patients who were hemodynamically unstable, operator’s perception of life-threatening deterioration during the procedure and with PEEP > 10 cm H2O were excluded. The patients were subjected to bronchoscopy and were investigated for post-procedure routine Gram stain culture/sensitivity under close monitoring, the patients were subjected to clinical examination, and the findings were noted. The data were analyzed using Statistical Software SPSS Version 20. Results: The need for secretion clearance was the major indication for bronchoscopy in COVID-ARDS (62.14%) patients. The post-bronchoscopy observations with respect to the nature of secretions were: purulent (34.2%), mucopurulent (15.53%), pink frothy secretion (11.97%), and necrotizing debris (0.97%). The BAL cell count ranged from 775 to 3310 per µl, the BAL fluid was predominantly neutrophilic with a range of 60.00–75.00%, which signifies secondary bacterial infection. The histopathological findings noted were nonspecific inflammation in 13.27%, benign tumor in 1.29%, and atypical carcinoid tumor in 0.65% of patients, bleeding was noted in 0.97% of patients. The culture/sensitivity findings noted in the study were: negative cultures in 45.31%, Klebsiella pneumonia (MDR) 28.99%, Klebsiella pneumonia (ESBL) 19.53%, and Acinetobacter baumannii (MDR) 18.34%. The escalation of treatment included, addition of antibiotics, diuretics, and antifungals (59.22%), while de-escalation of treatment included, antibiotics de-escalation, change in anticoagulation strategy, and removal of mucus plug (35.60%). The continuation of existing treatment was done in 5.18% of cases. Antibiotics were escalated in 40.78% of the patients and de-escalated in 26.21% of the patients based on bronchoscopic findings. The bronchoscopy procedure was associated with significant acute hemodynamic alterations, notably hypoxia. But, no statistically significant difference was noted.
with respect to change in ventilator parameters. Mortality was noted in 171 patients (59.58%) with treatment change compared with 40.91% of the patients without any change in treatment ($p = 0.116$). Sixteen HCW ($n = 16$) were involved in the procedure and followed up for symptoms of COVID infection. Five patients were symptomatic, but none of them tested positive for COVID-19 (RT-PCR).

**Conclusion:** Bronchoscopy provides significant important morphological, microbiological, and pathological information with reasonable safety for both healthcare workers and patients as well. Hence, the bronchoscopic intervention is valuable for diagnostic, therapeutic, and management-changing decisions. It should be strongly considered as a useful and safe modality to enhance the effective treatment of COVID-19 ARDS patients requiring mechanical ventilation who are at a high risk of deterioration.

**A Successful Case Report of Extracorporeal CPR with Intact Neurological Recovery in Fulminant Myocarditis with Cardiogenic Shock**

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**Introduction:** Fulminant myocarditis is a life-threatening fast progressive condition that has an unpredictable clinical course with a high risk of circulatory collapse and mortality ranging from 25 to 75% without immediate mechanical circulatory support. Extracorporeal membrane oxygenation (ECMO) has been shown to be an effective life-saving strategy in patients with fulminant myocarditis in cardiogenic shock who had cardiac arrest and on whom the conventional cardiopulmonary resuscitation has failed. **Case report:** A 41-year-old lady referred from an outside hospital presented with a history of fever myalgia generalized weakness since 5 days. On arrival, she was hypotensive tachycardic, and tachypneic with cold clammy extremities with borderline urine output. She was started on high-flow oxygen and isotropic support after initial fluid resuscitation. ABG showed severe metabolic acidosis with high lactates. Labs showed elevated cardiac enzymes. Tropical fever workup and urine microscopy were symptomatic, but none of them tested positive for COVID-19 (RT-PCR). **Conclusion:** With a complete recovery of neurological function, this was one of the rare cases of successful ECMR for fulminant myocarditis. This emphasizes the potential role of VA-ECMO in treating fulminant myocarditis in cardiogenic shock. **Keywords:** Cardiogenic shock, Extracorporeal cardiopulmonary resuscitation, Fulminant myocarditis. **Acknowledgments:** I am extremely thankful to my consultants Dr Arun V, Dr Prakash Doraiswamy, for their constant support, encouragement, and valuable guidance for my poster presentation. I would like to thank all my colleagues and ICU staff for their support and cooperation.

**COVID-19 Pneumonia in HIV**

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**Introduction:** The patients with sero-positive status have a high risk of acquiring opportunistic infections. A significant reduction in CD4 count and marked inflammatory activity are associated with poor overall prognosis in patients with COVID-19 pneumonia.

**Aims and objectives:**
- To study the association between low CD4 count with inflammatory markers, length of stay (LOS), and ICKIKADO score in sero-positive patients with COVID-19 admitted in the ICU.
- To study the impact of low CD4 count on overall disease severity in sero-positive COVID patients.

**Material and methods:**

**Sample size:** 50.

**Inclusion criteria:**
- Patients aged 18 years and above.
- Patients with sero-positive status.
- Patients with RT-PCR positive for COVID-19.
- Patients with bilateral lung involvement as suggested by chest X-ray.

**Exclusion criteria:**
- Patients unable to consent.
- Patients with comorbidities.
- Patients with tuberculosis on antitubercular therapy.

**Methodology:** The patients were divided into two groups based on CD4 count with those with CD4 count less than 200 cells/μl and those with CD4 count more than 200 cells/μl. Ferritin, C-reactive

**References**


protein (CRP), erythrocyte sedimentation rate (ESR), troponin, Lactate dehydrogenase (LDH), and D-Dimer values were recorded. Primary outcomes were hospital length of stay (LOS), Ichikado CT scores, and correlation of CD4(+) count and inflammatory markers. Descriptive statistics and Mann–Whitney U methods were used.

**Results:**
- Our study population was male predominated with 60% males and 40% females.
- Most common age group in our study population was 48 ± 7 (p < 0.01).
- There was a statistically significant difference in LOS in CCU (critical care unit) for patients with CD4(+) counts <200 cells/μl vs >200 cells/μl CD4(+) (10 days [6–18] vs 6 days [4–9]) p < 0.01).
- The Ichikado CT score was significantly different between groups (180[150–220] vs 140[128.7–192.5], p < 0.01).
- IL-10 values and IL-6 values were higher in those patients with CD4(+) less than 200 cells/μl as compared with higher CD4(+) counts. Median IL-10 was (22.2 pg/ml [17–72.45] vs 14.7 pg/ml [9.4–26.8], U = (109,100) = 3463, z = –4.550, p < 0.01), and median IL-6 was (22 pg/ml [10.5–99] vs 14 pg/ml [3.77–39], U = (104, 96) = 3444.5, z = –3.785, p < 0.01).
- Ferritin was increased in patients with CD4(+) counts lower than 200 cells/μl when compared with counts more than 200 cells/μl (845 ng/mL [383–1500] vs 535.5 ng/mL [255.1–1044], U = (110,106) = 4543.5, z = 2.813, p < 0.01).
- CRP had a similar pattern (72 mg/l [48.3–139] vs 61 mg/l [40–124.4], U = (111,105) = 4478, z = –2.940, p = <0.01), D-dimer (2.4 mg/l [1.55–6.14] vs 0.60 mg/l [0.39–1.78], U = (111,107) = 3992.5, z = –4.180, p < 0.01), LDH (635 IU/l [377–881] vs 383 IU/l [278–518], U = (102,92) = 2631.5, z = –5.227, p < 0.01) and troponin (0.020 ng/mL [0.014–0.05] vs 0.015 ng/mL [0.007–0.029], U = (91,90) = 2925, z = –3.321, p < 0.01).
- The only inflammatory marker that was not statistically significantly different was ESR (88 mm/hour [65–118] vs 74 mm/hour [55–95], U = (111,107) = 5113, z = –1.773, p = 0.076).

**Conclusion:** CD4 count less than 200 cells/μl is associated with increased length of CCU stay, elevated inflammatory markers, increased mortality, and higher Ichikado score. Low CD4 count can thus be considered as a poor prognostic marker in seropositive patients with COVID-19.

**Efficacy of HFNC and HFNC–NIV in Post-cardiac ARF Patients**

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**Introduction:** Intubation rates following planned extubation range 10–20% in the general ICU population. There is evidence that extubation failure can cause increased morbidity and mortality. Noninvasive ventilation is used as a routine practice in postop. respiratory failure in a cardiac patient. But high minute ventilation and tidal volume in NIV remain the major concern for the lung injury, air swallowing, and abdominal distention. **Aim and objectives:** Does HFNC prove to be a better option in treating ARF in postoperative cardiac surgery patients and improve morbidity and mortality? Extubation failure is considered if the patient required any form of respiratory support in the form of NIV or HFNC within 24 hours and after 24 hours, also which form of support they need post extubation failure. Similarly, document the mortality and morbidity in those patients who were treated with NIV, HFNC, or intermittent HFNC and NIV. **Material and methods:** The prospective observation was done in 43-bedded mix patient population ICU for the period from January 2011 to August 2022 of tertiary hospital. All postoperative cardiac surgery patients who successfully met the extubation criteria were involved. Demographic data, including age, sex, and supportive treatment, which they received post extubation, were documented.

**Results:**
- Total no. of patients was 894.
- About 46 patients had post-extubation respiratory failure.
- The average length of the stay on NIV was 5 days, and for HFNC, it was found to be 7 days.

**Conclusion:** In patients treated with NIV and HFNC or together, there was not much difference noted in terms of mortality, but HFNC was not found to be inferior to NIV, and compliance seems to be better with HFNC. **Discussion:** HFNC can be a favorable option in nonhypercapnic patient against the NIV. But, in the hypercapnic type of two respiratory failures, it still needs to be used judiciously.

**References**

**Early v/s Late Tracheostomy – Correlation with the Trachman Trial**

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**Introduction:** Tracheostomy is a routine procedure in long-term mechanically ventilated patients in adults’ intensive care units (ICUs). The timing of tracheostomy “Early” (with first 7 days of
Efficacy of Prone Position in Severe ARDS
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Rationale: The application of prone positioning for acute respiratory distress syndrome (ARDS) has evolved with recent trials focusing on patients with more severe ARDS and applying prone ventilation for more prolonged periods. It has largely been adopted by clinicians and is even used before intubation in spontaneously breathing patients (AWAKE PRONE).

We have observed in our ICU the effects of long-term prone positioning in both pulmonary and nonpulmonary severe adult respiratory distress syndrome (PaO2/FiO2 <100).

Materials and methods:
• Prospective, observational study. Tertiary care, intensive care unit.
• Study period – 2 years, 2019 and 2022.
• Total prone position given – 19.
• 13 males and 6 females.
• Pulmonary – 10 (non-COVID).
• Nonpulmonary – 9 (general, medical – 6, cardiac – 2, cancer – 1).
• Forty one cycles of prone performed on these 19 patients.
• Eleven were proned within 24 hours of intubation.
• Nine were proned after 48 hours.
• No cardiorespiratory arrest was noticed during or post proning although three patients had hypotension and were supine early before 20 hours.
• Prone survival – 8/19.
• Mortality – 11/19.
• Side effects.
• Minor skin injury and edema – 3.
• Unplanned airway accident (inadvertent extubation) – nil.
• Partial displacement – 1.
• Accidental catheter removal (art line, central line, and riles tube cannula) – nil.

Results:

<table>
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<tr>
<th>Total Patients 19</th>
<th>Pulmonary</th>
<th>Within 24 hours</th>
<th>After 24 hours</th>
<th>Nonpulmonary</th>
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<td>7</td>
<td>3</td>
<td>9</td>
<td>3</td>
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</table>

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Conclusion:
- Mortality is very high, survival was more in early prone, respiratory variable did improve, but the sustained improvement was not observed in more than 60% of patients.
- Secondary complication of prone position was minimal.

Discussion: The prone position does improve mortality in severe ARDS, we still have 50% mortality. Pulmonary and nonpulmonary disease categories do not show any significance in mortality.

References

Online Registry of COVID-19-associated Mucormycosis Cases, India, 2021

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Introduction: In India, we created an online registry of coronavirus disease-associated mucormycosis (CAM) cases. We examined data from 65 cases diagnosed between April and June 2021, when the Delta variant was prevalent, and discovered that patients frequently received antibacterial drugs and zinc supplements. This proof-of-concept study demonstrated that real-time data collection from online registries of CAM cases provided clinical insights into emerging infections. Objectives: To evaluate the significance of data collected from online registration of CAM cases or mucormycotic infections in COVID-19 (MUNCO) in India, 2021. Materials and methods: We solicited registry participation via social media and contacts at Indian hospitals. The study was approved by the Albert Einstein College of Medicine’s Institutional Review Board (approval no. 2021-13086) and the ethics boards of the author-affiliated hospitals, where applicable. Cases were entered into a REDCap database (www.covidmucor.com). The physician’s judgment in entering the data or radiographic findings was used to make the CAM diagnosis. Follow-up data were available for 53 (81.5%) patients and data were analyzed using R. Results: The median age was 56 years, the median weight was 64 kg, the median hemoglobin A1c level was 7.80%, and the median time between COVID-19 diagnosis and mucormycosis diagnosis was 20 days; the patients had a median hospital stay of 11.0 days. At 42 days, 17 (32.1%) of the 53 patients with available follow-up data had an incomplete recovery, 20 (37.8%) had a full recovery, 10 (18.9%) had vision loss, and 6 (11.3%) had died. Discussions: This proof-of-concept study demonstrates how rapid, real-time data collection using online CAM case registries can offer clinical understanding of the illness. For instance, due to the ease of use and quick data entry, information on these 65 cases was gathered in just 5 days. MUNCO is particularly helpful for doctors in environments where patient follow-up is not optimal and electronic medical records are rarely used. Because pragmatic case definitions are based on the clinician entering the data, this is MUNCO’s primary flaw. Additionally, this study lacked a control group of mucormycosis cases unrelated to COVID-19, which would have allowed for the identification of particular risk factors. We gathered data on 693 cases by August 2021, which we will soon examine for any additional risk factors linked to unfavorable outcomes. Conclusion: According to the study, online registries are a valuable tool for rapidly providing relevant data for real-time surveillance of infections linked to CAM or MUNCO in India.

End-of-Life Care Practice Patterns among Patients Admitted to a Tertiary Care Facility

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Introduction: Continuation of life support may be futile in some ICU patients, where end-of-life care discussion and practice may be the appropriate intervention.

Objectives:
1. To look at the various practice patterns in patients who fit the do not attempt resuscitation profile.
2. To look at the understanding and choices of families about end-of-life care and the interventions opted in and out during such situations.
3. To identify factors influencing end-of-life care decision.

Materials and methods: Forty-six patients who got admitted to a multidisciplinary tertiary care ICU between May 2022 and November 2022 were included in this retrospective observational study. Demographic information and clinical data were collected. DNAR form (do-not-attempt resuscitation form – published by ICMR – Indian Council of Medical Research) was used to capture major reasons for opting DNAR. Different components of end-of-life care selected by patients’ surrogates were documented and analyzed. Patient’s nutritional status, quality-of-life before hospitalization, and financial constraints for treatment were included in this study to understand the effect of these factors while taking decision of end-of-life care. Results: The study included a total of 46 patients whose surrogates had signed for end-of-life care. The mean age of the patients was 69.83 ± 14.55 years. End-of-life care discussion was initiated by either intensivist [17(36.96%)] or patients’ surrogates [29(63.04%)]. About 45 (97.83%) patients’ surrogates agreed for end-of-life care, and one patient’s surrogates did not sign for end-of-life care. The major reasons for opting end-of-life care include the patients with CVA [11 (21.74%)], age >80 years [12 (26.09%)], and prolonged restricted mobility [14 (30.43%)]. All patients’ surrogates...
had opted against cardiopulmonary resuscitation (CPR), but six patients’ surrogates wanted noninvasive ventilation (NIV) support as a part of end-of-life care, and two patients’ surrogates wanted dialysis as well. All patients’ surrogates had selected sedation (100%) and feeding (100%) as a component of end-of-life care. At the time of end-of-life care decision, 17 patients (36.96%) were on invasive ventilation, 9 patients (19.57%) were on vasopressor support, and 7 patients (15.22%) were on dialysis. Patients’ quality of life before hospitalization was noted too. Majority of the patients [17 (36.96%)] had restricted mobility and 16 patients (34.78%) were requiring assistance for ambulation before hospitalization. The nutritional status of the patients showed that only 24 patients (52.17%) were well-nourished. Mean duration of ICU stay before end-of-life care decision was 4.28 ± 4.57 days. Mean APACHE-2 score was 23.54 ± 7.36 and mean SOFA score was 4.45 ± 2.32. Total 10 patients’ surrogates (21.74%) had faced financial constraints for ongoing treatment and end-of-life care decision was revoked by two patients’ surrogates (4.35%). Out of 46 patients, 18 patients (39.13%) died in the hospital, and 28 patients (60.87%) were discharged at request. Conclusion: The practice of end-of-life care is being accepted by both the treating physician and patients’ families. However, most of the families still wanted some interventions to be continued while opting against CPR (feeding, sedation, NIV, dialysis, etc.). Among various factors advanced age, a neurological insult, and restricted mobility were the predominant reasons for end-of-life care decision.

References


A Study of the Effect of Cumulative Fluid Balance and B-line Score in Lung Ultrasound on Outcome of Extubation

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Introduction: Though early fluid resuscitation is the backbone of critical care management, definite volume targets are not well-defined. Many studies have shown the ill effects of positive cumulative fluid balance (CFB). This study attempts to establish an objective criteria using CFB and B-line score to predict extubation outcomes. Objectives: To evaluate the association of CFB and B-line score with extubation outcome. Materials and methods: Medical and surgical patients aged more than 12 years undergoing mechanical ventilation for >24 hours who had a planned extubation were enrolled. Cumulative fluid balance, defined as total fluid intake minus total fluid output since intubation to the time of extubation, was calculated. Lung ultrasound was done to calculate B-line score before extubation. The effect of these variables on extubation outcome was statistically analyzed. Results: In total, 26 out of 80 (32%) patients had extubation failure and required reintubation. Cumulative fluid balance was significantly higher in those who failed extubation (6166 ± 2239.62 mL vs 4443.75 ± 2401.47 mL), p-value of 0.004. The area under the curve for CFB to predict extubation failure was 0.73 (95% Cl: 0.62–0.84) with optimal cut-off of 4567 mL (sensitivity 73%, specificity 55.6%, p = 0.016). B-line score was significantly higher in the extubation failure group (8.42 ± 4.20) compared to those with successful extubation (5.61 ± 3.14), p = 0.001. Area under the curve for B-line score to predict extubation failure was 0.7 (95% Cl: 0.57–0.83) with a cut-off score of 7 (sensitivity 58%, specificity 91%, and p = 0.003). Using logistic regression, the Omnibus model of coefficients showed that combining CFB>4567 mL and B-line score ≥7 had a better predictability of extubation failure than either indices alone (p = 0.002). The presence of AKI, sepsis, and a higher APACHE-II score at admission was independently associated with more extubation failures (p < 0.001). Failed extubation was significantly associated with in-hospital mortality (p < 0.001), longer ICU length of stay (LOS) (p < 0.001), and hospital LOS (p < 0.001). Discussion and conclusion: The study corroborates the association of high CFB with adverse outcomes in the ICU. A higher CFB and hence a higher B-line score is significantly associated with extubation failure irrespective of diagnosis. Further studies are required to evaluate if active de-resuscitation in the form of fluid restriction or diuresis should be initiated when CFB and B-line score exceeds a certain cutoff value to facilitate successful liberation from mechanical ventilation.

References


Monitoring the Hemodynamic Events of Critically Ill Patients during Interhospital Transportation through a Novel Indigenous Tele-Ambulance and Tele-ICU System

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Introduction: Caregivers of patients with traumatic brain injury (TBI) experience a heavy stress burden that can manifest as psychiatric symptoms mimicking posttraumatic stress disorder (PTSD) and can negatively impact interpersonal relationships and work performance. **Objective:** The present study to evaluate the psychological effect on key caregiver in critically ill trauma patients and also to evaluate the socioeconomic burden of trauma on key caregivers between TBI and non-TBI patients. **Methods:** About 200 caregivers of critically ill trauma patients were admitted to the trauma ICU for at least 48 hours. They were divided into two groups: Group I: Patients with TBI with trauma ICU admission of more than 48 hours and Group II: Non-TBI patients (chest trauma, abdominal trauma, etc.) with trauma ICU admission of more than 48 hours. Only patients with key caregiver/family member at least 18-years-old, spouse, parent, child, sibling, or significant other; and able to read and complete study tools in Hindi, were included in the study. Caregivers in two groups were screened using clinician-administered PTSD scale for DSM 5 (CAPS-5) and critical care family needs inventory at the time of admission, at 7, 15, and 30 days, at the time of discharge, and at 3 months (follow-up). Finally, both the groups were compared on the basis of sociodemographic, clinical, and psychological parameters. **Results:** Most of the TBI survivors admitted in the ICU had severe injury (GCS 9.42 ± 4.22). Group I caregivers experienced higher family burden and severe psychological distress at the ICU. The results showed that 26% of caregivers of group I showed PTSD symptoms compared with 2% of caregivers of group II (p < 0.05). Caregivers of patients with TBI had higher stress burden and lower DSM5 scores than the group II (p < 0.05). **Discussion:** Studies suggest that more interpersonal contact with medical staff can help meet the information needs of patients’ families. The difficult behavior contributes to carer distress, but longitudinal and treatment studies are needed to establish causality. **Conclusion:** We concluded that caregivers of patients with TBI have a high stress burden that may lead to PTSD, highlighting the importance of providing psychological support to this group. There is an immediate need to assess psychological distress and family burden of caregivers at ICU and provide timely psychosocial intervention.

Clinical Profile and Outcome of Children with Acute Liver Failure Secondary to Severe Dengue in the Pediatric Intensive Care Unit at a Tertiary Care Hospital


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**Objectives:** To study the clinico-laboratory profile and outcome of pediatric acute liver failure (PALF) secondary to dengue virus infection admitted to the PICU of a tertiary care children's hospital. **Methods:** We performed a prospective observational study of children aged 1 month–18 years admitted to the PICU with PALF secondary to confirmed dengue fever. Pediatric acute liver failure was defined using pediatric ALF consensus guidelines. The study included all children admitted between January 2021 and November 2022. We analyzed clinical features, laboratory parameters, illness severity, and outcomes. **Results:** Out of 136 children with severe dengue, 38 (27%) had PALF. Among 38 children with PALF, 24 (63%) presented with shock requiring fluid resuscitation and 14 (37%) presented with encephalopathy and/or coagulopathy without shock. Fluids...
were titrated based on clinical and laboratory parameters as per WHO dengue management guidelines, organ support and blood transfusion were given as indicated. Six patients (15.7%) required renal replacement therapy in the form of continuous renal replacement therapy (5) or peritoneal dialysis (1). Seven (18.4%) patients received immunomodulatory therapy in the form of IVG ± steroids in view of dengue-related hemophagocytosis with persistent hyperinflammation. Eleven patients (29%) required vasopressors to maintain blood pressure. Twenty-nine (76.3%) patients had significant mucocutaneous bleeding. Twenty (52.6%) patients required abdominal drain insertion due to severe capillary leak causing intra-abdominal hypertension. Ten patients (26%) received mechanical ventilation due to worsening hemodynamics and/or encephalopathy, of whom 3 (7.8%) died due to multiorgan dysfunction syndrome. Thirty-three (86.8%) patients recovered completely, and one patient was transferred to a different center on parental request and died due to disease-related complications. One patient was transferred to a transplant center due to fulminant clinical course where he underwent auxiliary liver transplantation and survived.

Data summary:

| Patients | 38 |
| Predicted mortality (%) by PIM-2 and PELOD Scoring | M – 21, F – 17 |
| Median INR (IQR) | PIM-2: 2.9% |
| Median fluid overload at 48 hours (%) (IQR) | PELOD: 2.7% |
| Median ferritin (µg/l) (IQR) | 2 (1.6–2.5) |
| Median fluid overload at 48 hours (%) (IQR) | 5.7 (2.2–8.7) |
| Median ferritin (µg/l) (IQR) | 20,731 (5200–43,800) |
| Median AST (Units/l) (IQR) | 4998 (1116–8521) |
| Median serum ammonia (µg/l) (IQR) | 74 (59–97) |
| Median serum lactate (mmol/l) (IQR) | 5.9 (3.6–9.3) |
| Mortality | 3 (7.8%) |
| Immunotherapy | 7 (18.4%) |
| Mean ICU stay (days) | 6 |
| RRT | 6 (15.7%) |

Conclusion: Our study showed that acute liver failure secondary to severe dengue illness in children is not uncommon. Most patients recover with standard supportive care, like fluid titration, identifying and treating capillary leak and shock, and appropriate organ support. Children can have significant hyperinflammation, but the role of immunomodulation is unclear.

References


Acute Kidney Injury in Patients Undergoing Extracorporeal Membrane Oxygenation

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Introduction: Extracorporeal membrane oxygenation (ECMO) is gaining popularity as a means to support patients with severe cardiac or respiratory failure. Studies have suggested that acute kidney injury (AKI) can worsen the outcome of these patients. Primary objective: To study the occurrence of AKI in patients undergoing ECMO. Secondary objectives: (i) To study the risk factors for AKI in patients undergoing ECMO. (ii) To study the effect of AKI on in-hospital mortality. Methods: A retrospective study was done at Aster Medcity, Kochi. The sample size is 50 patients, which included patients who underwent extracorporeal membrane oxygenation for more than 24 hours. Acute kidney injury was diagnosed and categorized according to the Kidney Disease Improving Global Outcome (KDIGO) criteria. We excluded the patients who expired within 48 hours of initiating ECMO and also who were on maintenance dialysis.

Results:

- Mean age – 41.15 ±19.67 years, gender: Male – 28 (56%) and female 22 (44%).
- Diabetes mellitus – 11(22%), hypertension – 12 (24%), history of taking nephrotoxic drugs – 11 (22%), APACHE-II score more than 25 = 31(62%).
- Cardiac status based on EF >55% – 23 (46%), EF 40–55% – 10 (20%), EF <40% – 17 (34%).
- Types of ECMO venoarterial type – 23 (46%), veno-venous type – 27 (54%).

Discussion: Age, Acute Physiologic and Chronic Health Evaluation (APACHE-II) score, hypertension, nephrotoxic agents, inotropic support, and poor cardiac function were the risk factors associated with development of AKI. However, diabetes mellitus, type and duration of extracorporeal membrane oxygenation were not risk factors for AKI in our study.

Conclusion: Acute kidney injury is an independent risk factor leading to higher mortality in patients on extracorporeal membrane oxygenation. It is suggested to manage AKI early and appropriately in patients with risk factors. To the best of our knowledge, this is the first study from our region.

References


Comparison of Noninvasive Ventilation and High-flow Nasal Oxygen Therapy in Acute Hypoxic Respiratory Failure: A Prospective Randomized Interventional Study

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Materials and methods: A prospective randomized interventional study was conducted after clearance from the Board of Studies and Ethical committee in the Department of Anaesthesiology, Shaheed Hasan Khan Mewati Govt. Medical College, Nalhar, Nuh, Haryana, during 2020–2022. About 70 patients of 18–60 years with acute hypoxic respiratory failure, as per inclusion and exclusion criteria, underwent intervention with either HFNOT or NIV randomly based on the odd–even rule with 35 patients in each group. The study population was calculated using G-power software with 80% of power and a 5% of the significance level. Detailed relevant history and clinical examination were recorded in the Performa specially designed for the study and analyzed with standard statistical methods. The p-value was considered to be significant when less than 0.05. No potential risks exist in the design of this study. Results: The mean age among the HFNOT group was 40.51 ± 15.50, the CPAP group was 37.46 ± 13.42, and the overall study population was 38.99 ± 14.47 years. The study population consisted of 45.7% males and 54.3% females. There was no significant difference in mean HR, MAP, pH, HCO₃⁻, and PaO₂/FIO₂ at initiation, at 1 hour, at 3 hours, at 12 hours, and 24 hours between HFNOT and CPAP. The mean respiratory rate at 3 hours, at 12 hours, and 24 hours was significantly lower among the HFNOT group compared with CPAP. The mean pO₂ at 3 hours, at 12 hours, and at 24 hours was significantly more among the HFNOT group compared with CPAP. The mean PaCO₂ at 3 hours, at 12 hours, and at 24 hours was significantly lower among the HFNOT group than in the CPAP group. Conclusion: There was no significant difference in weaning, recovery rate, and other outcomes, i.e., mean duration of use, mean duration of hospital stay, mean duration of ICU stay, and complications during hospital stay between HFNOT and CPAP; however, relief in dyspnea and improvement in oxygenation was better with HFNOT, though death, intubation rate, and shift to BIPAP were more among CPAP. Thus, the study demonstrated that compared with NIV, HFNOT achieved similar outcomes and fewer adverse events. The present study demonstrates that HFNOT is a safe and well-tolerated means of oxygen delivery. Despite a high oxygen flow rate, HFNOT seems to be better tolerated than NIV and results in better oxygenation for the same set of FIO₂. In addition, the HFNOT decreases PaCO₂ and the respiratory rate while improving patient comfort, reducing episodes of interface dislodgement, oxygen desaturation, and comfortable weaning as compared with NIV. However, NIV is considered a “step up” over conventional nasal cannulae and face masks. Since HFNOT cannot generate adequate PEEP compared with NIV, it may be prudent to consider HFNOT as an in-between therapy, with true efficacy lying somewhere between face masks and NIV.

Introduction: Early prediction of intubation in the ICU is effective in preventing any complications. The aim was to see whether machine learning can predict the need for intubation with the help of bedside easily obtained variables. Methods: The test cohort comprised of 1500 nonintubated patients admitted in the ICU. This cohort was used to predict the need of intubation with help of random forest logistic regression by using simple bedside variables comprising of sex, age, qSOFA, medical/surgical category of patients, shock index, respiratory rate, GCS, PaCO₂, requirement of vasopressors, and lactate level. We extracted data of our tertiary care ICU of last 5 years. Results: The data of 12,345 patients were included, of which 2980 required intubations and 9360 required no intubation. Random forest had AUC 0.631 (95% CI 0.79–0.81). Logistic regression had AUC 0.769 (95% CI 0.78–0.81) for intubation prediction performance. Discussion and conclusion: The variables used in this study can be easily obtained at the bedside, and with the help of machine learning, can predict need for intubation through logistic regression.

References

Validation of Noncontact Camera-based Vital Screening Technology for Effective Triageing of Emergency Department Patients
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Introduction and objectives: Accuracy and speed of recording vitals are crucial for Emergency Department (ED) triaging. Traditionally, vital signs measurements are either skipped or recorded using contact-based devices. However, during the COVID pandemic, this system of screening was questioned. It increases the risk of infection to healthcare workers and can lead to inaccurate vitals recording due to nonstandardized devices. An undertrained and understaffed increases the risk of subjectivity, thus causing over- or undertriaging, resulting in an improper use of hospital recourses and poor patient outcomes. Camera-based, noncontact vitals recording is a novel way to overcome these shortcomings. In this study, we aim to validate the noncontact-based vitals screening technology, co-created by Manipal and Philips, in effectively triaging patients visiting the ED at Kasturba Hospital, Manipal. Materials and methods: The study is a prospective observational single-center study conducted from March to July 2022 to collect data from 100 patients visiting the hospital ED. After consent, in a sitting position, the subject’s pulse rate (PR), respiration rate (RR), and temperature (T) were recorded in a closed kiosk using noncontact cameras for 1 minute. For comparison, the representative standard-of-care contact-based devices, PR, and RR from FDA-approved Philips Alice NightOne and T from an oral digital thermometer were used. Apart from analyzing the accuracy of the noncontact vitals, recorded data were annotated by three
To evaluate the clinical utility of ulinastatin, a multifunctional serine protease inhibitor, in the management of severe acute pancreatitis. **Introduction:** Acute pancreatitis (AP) is an inflammatory disease with varied severity and is one of the most common gastrointestinal disorders requiring acute hospitalization. Most episodes of acute pancreatitis are mild with self-limiting local inflammation and only necessitate a short hospitalization (~48 hours). However, in 15–25% of patients, it manifests with systemic involvement, tissue necrosis, or infection. The mortality rate of the disease is heterogeneous, ranging from nearly 0% in mild pancreatitis up to 80% in severe necrotizing pancreatitis. Despite improvements in intensive care treatment during the past few decades, effective therapies for acute pancreatitis are still limited. Ulinastatin is a multivalent serine protease inhibitor that is found in human urine and blood, it can stabilize the lysosome membrane and inhibit lysosome function, inhibiting the various enzymes and inflammatory response. In this study, we aim to evaluate the effect of ulinastatin in the treatment and prevention of organ failure in severe acute pancreatitis with regular treatment in an add-on trial.

**Materials and methods:** We conducted a retrospective analysis of the archived data of adult patients diagnosed with acute pancreatitis and admitted to Anaesthesiology Intensive Care Unit, AGMC & GBPH, Agartala, Tripura, with one or more end-organ dysfunctions. The patients were divided into two groups depending on whether they did or did not receive ulinastatin. Outcome variables namely in-ICU mortality, development of new-onset organ dysfunction, resolution of existing organ dysfunction, sepsis control by day 7, and length of hospital stay were compared. **Results:** In eighty patients, 40 who received ulinastatin (ulinastatin group) and 40 who did not (placebo group) were analyzed. The in-ICU mortality was significantly lower in the ulinastatin group (16% vs 69.6%; p = 0.0003). Significantly smaller proportion of patients (20% vs 73.9%; p = 0.0004) developed new-onset organ dysfunction in the ulinastatin group by day 7. The resolution of existing organ dysfunctions by day 7 was more frequent in the ulinastatin group. The duration of hospital stay was much less in the ulinastatin group. **Discussion:** Premature activation of digestive enzymes (especially, trypsinogen into trypsin) within the acinar cells of pancreas is the key event in early pathogenesis of AP, leading to autodigestion of the pancreas. This is associated with early inflammatory reaction within the pancreas. In SAP, the systemic vascular injury results in vascular leak syndrome affecting the cardiovascular, renal, and respiratory systems. Systemic endothelial dysfunction may also manifest as diffuse activation of coagulation, with clinically
significant thrombotic complications. Ulinastatin inhibits various serine proteases involved in the development of inflammation (both local and systemic) and dysregulated coagulation. It acts as an agent for immune modulation to prevent organ dysfunction and promote hemostasis. **Conclusion:** Ulinastatin treatment with other supportive treatment was associated with improved outcomes in patients with severe acute pancreatitis. **Keywords:** Mortality, Organ dysfunction, Severe acute pancreatitis, Ulinastatin.

**References**


A Prospective Observational Comparative Study of Prevalence and Risk Factors for Carbapenem Resistance and Noncarbapenem Resistance in Gram-negative Bacilli in Critically Ill Patients

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**Background and Introduction:** Antimicrobial resistance has emerged as a great concern in healthcare settings, especially the rising trend of carbapenem resistance. Various risk factors are known for development of antimicrobial resistance. But, whether these risk factors increase similar resistance to all antibiotics or there are some specific risk factors of developing carbapenem resistance (CRE) – is not well-studied. The mechanisms of resistance to carbapenem can be diagnosed by PCR-based gene detection of different types of carbapenemase enzymes, and that may help to decide antibiotics regimen. So, identification of risk factors of developing CRE may help to reduce resistance by modifying these risk factors in routine practices and thus needs evaluation. **Objective:** The primary objective of this study is to compare different risk factors responsible for the development of carbapenem resistance and noncarbapenem-resistant (i.e., carbapenem sensitive, but resistant to others) Gram-negative bacilli in critically ill patients. The secondary objectives are to know the prevalence of carbapenem resistance in Gram-negative bacilli and distribution of different genetic patterns of carbapenem resistance in GNB. **Materials and methods:** This is a prospective, observational, comparative single-center study, conducted at Medical ICU of Eternal Hospital, Jaipur. Inclusion criteria are all eligible ICU patients having any growth of Gram-negative bacilli from any site resistance to at least one antibiotic. The study period is from February 2022 to January 2023. Sample size – 100 patients (estimated as per previous year microbiology culture data of the hospital). PCR-based CARBA test is done by “TRUPCR” kit. As of 20th August 2022, 56 patients have been recruited. **Results:** Among the risk factors, history of mechanical ventilation, presence of indwelling (central line, hemodialysis catheter, and urine catheter) within the last 1month of admission was found higher in carbapenem-resistance (CRE) group. During ICU stay, patients receiving carbapenem developed higher number of CRE in later cultures. During ICU stay, need of mechanical ventilation, hemodialysis, central line, and urinary catheterization was observed higher in CRE. High prevalence (55%) of carbapenem resistance was found. A combination of NDM and OXA 48 was seen as the commonest pattern. The respiratory tract was seen as the commonest site of infection. *Klebsiella pneumoniae* growth was seen as the commonest GNB in culture. **Conclusion:** Recruitment is expected to be completed by January 2023. So, the final results and conclusion can be drawn after that only.

**Trends of Renal-resistive Index in Predicting the Course of Acute Kidney Injury in Critically Ill Patients**

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**Background:** Predicting the course of AKI is important in critically ill patients to make therapeutic decisions. At present, this is based on change in the serum creatinine and or increase in urine output. Serum creatinine and urine output as markers of renal function have several limitations and depend on multiple factors. This study was conducted to find the utility of renal-resistive index (RRI) measured by renal Doppler in predicting the course of AKI in ICU. **Objectives:** To assess the performance of trends of renal-resistive index in predicting the course of AKI in critically ill patients. **Material and methods:** About 44 adult patients aged >18 years, admitted to a tertiary care teaching hospital ICU with AKI, diagnosed based on KDIGO criteria, were prospectively evaluated from February 2021 to March 2022. Renal-resistive index was performed at admission, 12 hours, 24 hours, and 36 hours after admission. Transient AKI was defined as urine output normalization and/or serum creatinine decrease by 50% and/or serum creatinine normalization to its measured or estimated baseline level by 5th day after admission. Persistent AKI was defined as persistent elevated serum creatinine >50% of measured or estimated baseline or persistent oliguria. Renal-resistive index at admission and change in RRI from baseline was compared between patients with transient and persistent AKI. The ROC curve was plotted to find RRI cutoff with the optimal sensitivity and specificity to predict reversibility of AKI by day 5 after admission to the ICU. **Results:** Their mean age was 55 ± 15 years, males outnumbered females (60%). In total, 54% (n = 24) of patients were on mechanical ventilator and 41% (n = 18) of patients required vasopressors. Their median (IQR) APACHE-II score was 21 (14–20) and median (IQR) length of ICU stay was 8 (4–13) days. About 34% (n = 15) of patients either died or DAMA from the ICU. Median (IQR) RRI at admission was not significantly different between patients with transient and persistent AKI [0.78 (0.72–0.82) vs 0.76 (0.70–0.82), (p = 0.48)]. An average of four RRI readings that were obtained at admission, 12, 24, and 36 hours after admission was significantly more in patients with persistent AKI compared with transient AKI [0.80 ± 0.03 vs 0.72 ± 0.05] (mean ± SD, (p < 0.001)). **Conclusion:** ROC curve analysis for calculating the optimal cutoff value of the difference in RRI at admission and 36 hours after admission for predicting transient AKI showed that either decrease or no change in RRI value from admission to 36 hours has a sensitivity of 86% and a specificity of 78% to predict transient AKI (the area under the ROC curve (AUC) = 0.917; p < 0.001). **Conclusion:** Among patients with AKI at the time of admission to the ICU, RRI at admission is not significantly different between patients with transient and persistent
Aim: Out of the 89 patients, 47 patients (53%) were

Objectives: To assess the patients who had simple weaning the time of SBT.

Conclusion

of 0.001; Emotional well-being at 0 months 36.31±16.22 and at 6 months 50.83±12.96 with a p value of 0.001; Social functioning at 0 months 38.88±20.69; and at 6 months 51.29±22.25 with a p value of 0.001; Pain at 0 months 51.38±27.99; and at 6 months 71.47±25.82 with a p value of 0.0001. In physical assessment Muscle wasting at 0 months was seen in all areas in 6 (2%) patients, in some areas in 20 (66%) patients and no muscle wasting in 4 (32%) patients, at 6 months all areas had wasting in 1 (0.03%) patient, in some areas in 5 (3%) patients and no muscle wasting in 12 (40%) patients, mMRC dyspnea scale grade 4 was seen in 3 (10%) patients at 0 months and none at 6 months; 6 Minute walk distance of 249 meters could be completed by 17 (53%) patients at 0 months and 25 (83%) patients at 6 months. Of the males who survived, 11 resumed work. One patient died after discharge before follow up. Conclusion: The survivors of Sars Cov-2 delta variant had mild cognitive deficit at discharge which improved at 6 months. Furthermore, poor Physical Conditioning, significant Role Limitations due to physical condition and emotional wellbeing, low energy levels, low Emotional well-being, poor social functioning, higher incidence of generalized pain and poor general health was observed which improved markedly at 6 months but not to full recovery. The physical assessments showed that significant number of patients had muscle wasting; respiratory symptoms at first follow up and exercise limitation as observed by mMRC dyspnea scale and 6-minute walk tests at 0 and 6 months. Thus survivors of covid 19 delta variant had significant long lasting complications which persisted up to 6 months, which may be termed as ‘Post intensive care Syndrome’.

References


A Prospective Correlation of Diaphragmatic Ultrasound with RSBI in Liberation from Mechanical Ventilation in Adult Intensive Care Unit

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Introduction: Diaphragm dysfunction is an underestimated phenomenon that can pre-exist upon ICU admission, or develop early during the first 24 hours of ICU course. Sepsis and mechanical ventilation are the main risk factors. The use of ultrasound to evaluate the respiratory muscle function (especially the diaphragm) is relatively new, and remains infrequent due to the supposed difficulty in obtaining adequate ultrasound windows, and the common assumption that ultrasound evaluation of the diaphragm would not alter patient management. However, the ultrasound learning curve focused on this muscle is fast, requiring just a short course. Diaphragm ultrasound is able to provide serial, non-invasive data at the bedside of critically ill patients. Various sources of injury (sepsis, mechanical ventilation etc) may alter the contractile function of the diaphragm in critically ill patients. Numerous measuring indices have been evaluated to determine the optimum weaning timeframe to avoid reintubation. Among these, the rapid shallow breathing index (RSBI) has gained widespread usage owing to its simplicity of computation and avoidance of complicated pulmonary mechanics calculations. However, there are limitations in using RSBI to predict successful extubation as it does not consider the independent contribution of the diaphragm and is influenced by the accessory muscles of respiration. Aim: This study aimed to evaluate real time ultrasound in evaluation of diaphragmatic excursion and thickening with RSBI to predict extubation outcomes. We aimed to compare these parameters with RSBI in successful extubation from mechanical ventilation in Adult Intensive Care Unit. Objective: To validate the diaphragmatic ultrasound and RSBI in patients who are planned for extubation in intensive care units by predicting extubation outcome and helping physicians to think about long term ventilation thereby decreasing the incidence of reintubation. Methods: From May 2022 to August 2022, this longitudinal observational research was conducted in the adult ICU of a tertiary level hospital in Coimbatore. During spontaneous breathing trial (SBT), Diaphragmatic excursion (DE) and Diaphragmatic thickness (DT) was evaluated using ultrasonography machine with the patient in semi recumbent position with the bed elevated between 20º and 40º. Measurements were recorded in a data sheet. RSBI was also simultaneously calculated at the bedside. After the 30 minutes of T-piece trial without deterioration, extubation was done and patient was followed up for 48 hours post-extubation for signs of extubation failure. For the patients who needed reintubation, the USG measurements during the T-piece trial was correlated with RSBI and other parameters. Diaphragm ultrasonic measurements were obtained in both brightness (B) and motion (M) mode.

Inclusion criteria:
- Patients with more than 48 hours on mechanical ventilation.
- Patients who fulfils the requirement of extubation criteria with other traditional parameters.
- Patients who are more than age of 18 years.
Exclusion criteria:
- Patients with neuromuscular disorders,
- Patients with traumatic chest injuries,
- Antenatal mothers
- Patients on tracheostomy tube
- Sample size n = 108.

Results:
Out of 108 patients 76 were males and rest females. 102 were successfully extubated (94.44%), 6 failed extubation (5.66%). Using spearman’s rho correlation models Rsbi had a negative correlation with diaphragmatic thickness and diaphragmatic excursion with values of -0.210 and -0.409 with p values of 0.029 and 0.0001 respectively on the 2 tailed test of significance. Using Logistic regression analysis, incorporating diaphragmatic thickness and excursion with rsbi to predict successful extubation, a p value of 0.002 was obtained with chi square test and a cox and snell R square value of 0.129. Beta coefficients of diaphragmatic thickness, diaphragmatic excursion and rsbi were -4.09; -2.347 and -0.126 respectively with p values of 0.012; 0.189 and 0.034 respectively. Conclusion: Rsbi negatively correlates with Diaphragmatic thickness and excursion measured on ultrasound. Incorporating all 3 parameters can predict successful extubation better than any one single parameter.

References

Comparison of Gastric Insufflation Volume of Baska Mask and LMA Proseal – A Randomized Controlled Trial

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Introduction: Many supraglottic LMA available nowadays, one of the newer advancements is Baska mask, which is cuffless LMA with two side ports, apart from ventilating port. When LMA sealing is not adequate, there is a risk of gastric distension and aspiration. Hence, we are assessing the gastric distension with USG by measuring the gastric antral volume, comparing it with the Baska mask and proseal LMA. Material and methods: Totally 58 adult patients of either sex requiring general anesthesia were randomized into two groups:
- Group A (Baska mask, n = 29) or Group B (PLMA, n = 29).
- After standardized induction with propofol 2–2.5 mg/kg and fentanyl 2 mg/kg, and muscle relaxation with vecuronium 0.1 mg/kg, one of the two devices was placed. Gastric antral volume was measured using USG at three different time periods, before and after insertion of LMA, and at the end of surgery. Other secondary parameters are sealing pressure, peak inspiratory pressure, and postoperative sore throat are measured. Result: So far, 30 samples have been completed, 14 in proseal group and 16 in Baska group; age, gender, ASA category, and LMA size have been generalized in both groups. Gastric volume in both groups are similar, not statistically significant for this sample size, proseal pre vs post 0.90 (3.39) vs 0.71 (2.65) and Baska mask pre vs post 3.58 (9.48) vs 3.49 (9.54); p-value for gastric volume 0.576. The oropharyngeal sealing pressure is better in Baska group than in proseal, but not statistically significant when compared with proseal. Insertion time is lesser in Baska group than proseal, postoperative sore throat incidence is lesser in Baska group 18% compared with proseal, which has an incidence of about 27%. Discussion: In our study, we found that there was no significant difference in the gastric antral cross-sectional area between the two groups. The secondary parameters such as oropharyngeal sealing pressure, peak airway pressure, tidal volume, end-tidal CO₂, and insertion time were found to be similar among both the groups. Another major finding in our study was the incidence of postoperative sore throat found to be lesser in the Baska group when compared with proseal group. Our study is unique in the fact that there are no studies available comparing the degree of gastric insufflation between Baska mask and proseal LMA during positive pressure ventilation. The major limitation of our study is the inadequate sample size which can be overcome by completing it.

References

Development of a Cost-effective Scoring System for Prediction of Intradiastolic Hemodynamic Instability in Critically Ill Patients Using Clinical and Ultrasonographical Tools – A Prospective Analytical Cross Sectional Study

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Introduction: Intradiastolic hemodynamic instability (IHI) remains a common problem associated with increased mortality and delayed renal recovery. Development of a scoring system for prediction of IHI will help identify patients at risk and take appropriate therapeutic interventions. Objectives: To identify relationship between baseline patient characteristics, macrohemodynamic, hypoperfusion, volume status, left ventricular function parameters, and intradiastolic hemodynamic instability. Material and methods: A prospective analytical cross-sectional study was conducted in a 14-bed multidisciplinary ICU. The patients admitted with acute kidney injury requiring hemodialysis at admission or during course of ICU stay were included in the study. Patient’s APACHE-II score, indication for hemodialysis, cardiovascular SOFA score, capillary refill time (CRT), transthoracic echocardiography-based left ventricular systolic function assessment, IVC distensibility, or collapsibility index assessed based on whether the patient was on controlled or spontaneous ventilation, cardiac output assessment using velocity time integral-based stroke volume estimation and passive leg raise test were measured just before hemodialysis (done as either intermittent hemodialysis or slow low efficiency dialysis). The occurrence of IHI necessitating therapeutic intervention was
recorded, defined as drop of >20 mm Hg systolic blood pressure or >10 mm Hg mean arterial pressure. Results: Total of 200 sessions hemodialysis were recorded. Intradialytic hemodynamic instability was recorded in 138/200 patients (69%). The commonest indication for hemodialysis was severe metabolic acidosis (85%). The median APACHE-II score was higher in IHI group than non-IHI group (25% vs 19%, p = 0.006). Similarly, cardiovascular SOFA score ≥1 (66% vs 34%, p < 0.000), CRT > 3 seconds (69% vs 31%, p < 0.000), cardiac output using stroke volume estimation (66% vs 34%, p < 0.000), passive leg raise test positivity (69% vs 31%, p < 0.000), IVF collapsibility/distensibility index (69% vs 31%, p < 0.000), and LV systolic dysfunction (mild to severe) (69% vs 31%, p < 0.000) were significant in predicting IHI. Discussion: Intermittent hemodialysis is a key support therapy in ICU. Despite protocol-based optimization, IHI remains a frequent issue in critically ill patients. Intradialytic hemodynamic instability mainly occurred during the first hour of treatment in the absence of ultrafiltration. Using a simple scoring tool combining macrohemodynamic and microcirculatory parameters without the need for blood investigations helped in predicting the risk of intradialytic hypotension and taking necessary therapeutic interventions early to avoid further morbidity and mortality.

References

Predictors of Failure of Noninvasive Oxygenation Methods like High-flow Nasal Cannula and Noninvasive ARDS Patients
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Objectives: The aim of this study was to determine predictors of failure of noninvasive oxygenation methods like high-flow nasal cannula (HFNC) and non-invasive (NIV) in COVID-19 ARDS patients.

Materials and methods: A retrospective cohort study of 441 COVID-19 patients admitted to the intensive care unit of a tertiary care teaching hospital in central India. We screened all admissions
to the SARI-ICU beginning in April 2020 by chart review. Using this sampling frame as a starting point, we identified cohort members who met the inclusion and exclusion criteria. Adult patients with ARDS needing NIV or HFNC during their course of hospital stay were included, leaving those having contraindications to NIV and HFNC or receiving the same in referring hospital or those who were intubated within 2 hours of admission. Various parameters were tabulated from patients’ ICU charts, like age, SOFA score, comorbidities, ARDS severity, sepsis, steroid dose, medications, etc. Derived parameters like ROX score and HACOR score were calculated from patients’ charts. HFNC/NIV failure was defined as intubation or death. Kaplan–Meier curves for time-to-failure events using concepts from survival analysis (time exchangeability and right censoring) were employed. Cox-Proportional Hazard Regression analysis was used to identify the factors that contributed to the failure. First, a univariate Cox-PH regression was conducted, and variables with a p-value of less than 0.2 were chosen for multivariate analysis evaluation. Results: In our study, the HACOR score decreased in the success group from 4 to 2, while it eventually increased in the failure group from 6 to 7. The ROX index in the failure group kept dropping; on day 3, it was 3.32 in the failure group vs. 5.62 in the success group; on day 6, it was 2.89 vs. 6.84 in the success group. We calculated the cutoff using four different methods: direct logistic regression, 90% minimum sensitivity, high negative predictive value, and ROC. The median serum CRP in the NIV failure group was higher at baseline (116 vs 75), and it was also higher on day 10 of the illness (75.3 vs 15.2). Age, SOFA, and ROX D3 were significant factors in the multivariate logistic regression model which predicted the failure. Out of the 262 patients who failed NIV, 37 eventually passed away while receiving NIV as a result of a sudden CVS collapse. Thus, 225 patients were ultimately intubated; 184 of these patients died, leaving only 41 to survive after mechanical ventilation, representing an 81.7% mortality rate in the NIV/HFNC failure group. Conclusion: First study to compare the ability to predict NIV failure of the HACOR and ROX scales. The study proved the noninferiority of the ROX index in predicting NIV failure as being a simple bedside assessment tool. A cut-off of 4.47 on day 3 has a good capacity for discrimination in predicting NIV failure. Older ages and the SOFA score at admission may have a big impact on the ROX’s ability to predict NIV failure from a multivariable perspective.

References

To Study the Validation of ExPreS Score in Successful Prediction of Extubation Outcome in a Single Tertiary Care Center
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Introduction: Extubation failure is defined as the inability to sustain spontaneous breathing after removal of the endotracheal tube and need for reintubation within 48 hours following extubation. Both delayed extubation as well as early extubation are associated with worse outcomes. Extubation delay is associated with ventilator-associated pneumonia, increased length of stay, increased risk for downstream tracheostomy, and increased mortality in brain-injured patients. Extubation failure after planned extubation is associated with adverse outcomes, including increased hospital mortality, prolonged hospital stays, higher costs, and greater need for tracheotomy and transfer to post-acute care. Objective: To predict the outcome after extubation using ExPreS score in mechanically ventilated patients. Materials and methods: This retrospective cohort study was conducted on 274 patients who had mechanically ventilated in ICU at KMCH. They were clinically stable and had the criteria for weaning from the ventilator. We measured RSBI, Cdyn and monitored days of mechanical ventilation, GCS, muscle power, Hct, creatinine, and neurological comorbidity. Results: ExPreS score predicted readmission success in 241 patients (87.9%) and extubation failure in 13 patients (4.7%), falsely positive in 10 patients (3.6%), and false negative in 10 patients (3.6%). The sensitivity of ExPreS score in extubation patients is 96% and the specificity is 56%. RR is 2.24 between extubation success and failure group (at 95% confidence interval with 5% error). Area under the receiver operator curve shows 0.9167 that shows ExPreS score has a validation of 90% chance of predicting the incidence of reintubation. Conclusion: The ExPreS score is a multiparameter score that was developed by incorporating different respiratory and nonrespiratory parameters associated with extubation outcome, and is found to be a reliable predictor of extubation outcome in patients receiving mechanical ventilation in the ICU. Keywords: Extubation, ExPreS score, RSBI.

References
1. MacIntyre NR. Evidence-based guidelines for weaning and discontinuing ventilatory support: A collective task force facilitated by the American College of Chest Physicians; the American Association for Respiratory Care; and the American College of Critical Care Medicine. Chest 2001;120(6 Suppl):375S–395S. DOI: 10.1378/chest.120.6_suppl.375s.

Development of an Extubation Predictive Score in Critically Ill Patients – A Prospective Analytical Cross Sectional Study
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Objectives: Despite the best efforts, extubation failure rates in mechanically ventilated patients remain high in critically ill patients. Extubation failure is associated with increased morbidity and mortality. Over the years, multiple parameters have been evaluated during a spontaneous breathing trial (SBT) to predict the
extubation failure. Recently lung, heart, and diaphragm ultrasound-based parameters were also extensively evaluated to predict the extubation failure. But none of the conventional or ultrasound-based parameters were useful for predicting extubation outcomes when used individually because of the complex pathophysiology of weaning failure. Multiple weaning indices and scoring systems have been designed and tested, but none of them incorporated any of the recent ultrasound-based parameters. This study aimed to identify ultrasound and nonultrasound-based parameters associated with extubation failure and to use these parameters to develop a score to predict extubation failure. **Materials and methods:** This prospective analytical cross-sectional study was conducted in patients aged ≥18 years who were receiving invasive mechanical ventilation (IMV) through an endotracheal tube for >24 hours. The weaning process followed the established ICU protocol. Ultrasound and nonultrasound-based parameters were recorded during IMV, in the end phase of weaning in pressure support ventilation (PSV) mode, with inspiratory pressure of 7 cm H2O over the PEEP (positive-end expiratory pressure). Patients who tolerated this ventilation were extubated and monitored for extubation failure. Extubation failure was defined as reintubation, application of noninvasive ventilation or death within 48 hours post extubation. Ultrasound-based parameters measured were left ventricular systolic ejection fraction, left ventricular end-diastolic pressure estimation by measuring E/e', lung ultrasound score (LUS), diaphragmatic thickness fraction, and diaphragmatic excursion. Multiple nonultrasound-based parameters were also measured. Parameters that showed statistically significant association with extubation outcome were further investigated using the receiver operating characteristics (ROC) analysis to assess their predictive value. The area under the curve (AUC) values were used to select parameters in the development of the extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score. **Results:** A total of 101 patients were extubated: extubation succeeded in 99 (89.1%) patients and failed in 11 (10.9%) patients. RSBI (0.972), APACHE II score (0.655), duration of IMV (0.845), E/e' (0.969), LUS score (0.901), and serum creatinine (0.693) were having significant AUC values. Other parameters, including diaphragmatic thickness fraction (0.175) and diaphragmatic excursion (0.021) were not having significant AUC values. **Conclusion:** Parameters significantly associated with extubation outcome were RSBI, APACHE-II score, duration of IMV, E/e’, LUS score, and serum creatine. These parameters were used to create the score. The AUC value for the score was higher than the AUCs of the individual parameters. The multi-parameter score measured was left ventricular systolic ejection fraction, left ventricular end-diastolic pressure estimation by measuring E/e’, lung ultrasound score (LUS), diaphragmatic thickness fraction, and diaphragmatic excursion. Multiple nonultrasound-based parameters were also measured. Parameters that showed statistically significant association with extubation outcome were further investigated using the receiver operating characteristics (ROC) analysis to assess their predictive value. The area under the curve (AUC) values were used to select parameters in the development of the extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score. Univariable logistic regression analysis and ROC analysis were performed to evaluate the performance of extubation predictive score.
**Background:** Venous thromboembolism (VTE) which includes deep vein thrombosis (DVT) and pulmonary embolism (PE) is a common complication in the ICU. Critically ill patients are at risk of venous thrombosis, and guidelines, therefore, recommend daily thromboprophylaxis. Deep vein thrombosis (DVT) usually occurs in the lower limbs but can also occur in other sites, including the head and neck, trunk, and upper limbs. The prevalence and complications of lower limb DVT in the intensive care unit setting are well reported in the literature. The presence of indwelling catheters, the presence of arm restraints, lack of physical mobility, and administration of high osmolarity medicine increases the risk of upper limb and neck veins in the ICU. The incidence of non-lower limb DVT is not well-studied in the literature. **Objectives:** The primary objectives of the study were to measure the incidence and anatomical location of non-lower limb DVT in patients admitted to a general ICU. The secondary objectives were to identify the risk factors associated with development of non-lower limb DVT in the ICU and its clinical outcomes. **Materials and methods:** This is an ongoing prospective observational study in the Intensive Care Unit of the Department of Critical Care Medicine in Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow. The study will be conducted from October 2021 to January 2023. Institutional Ethics Approval was obtained prior to the study. All adult patients who are expected to stay beyond 72 hours were included in the study. Patients who already have a DVT at the time of admission were excluded from the study. Sequential compression device was used for all patients. Prophylactic anticoagulation was given if there were no contraindications. Baseline characteristics, demographic data, and predisposing factors of all patients were collected at admission. All patients were screened at admission into the ICU with a compression ultrasonography of the deep veins of neck, upper limbs, and lower limbs within 48 hours. Subsequently, they were screened weekly or if there is suspicion of DVT in the form of unilateral limb edema, warmth, or tenderness. The patients were followed till their death or discharge from the ICU. Baseline characteristics, predisposing characteristics, and ongoing prophylactic treatment measures were collected. Appropriate statistical tests were used to identify risk factors associated with DVT. **Results:** Of the 155 patients enrolled in the study, 27 had internal jugular vein DVT (7.4%) and 4 had femoral vein DVT (2.6%). Two patients (1.3%) had developed DVT by 7 days while 17 patients (4.5%) had DVT by 14 days, while 14 (9%) and 8 (5.2%) patients had developed DVT by days 28 and 42, respectively. Risk factors for neck vein DVT included the presence of blood stream infection (OR 7.15; 95% CI 3–17), central venous catheter days (OR 1.34; 95% CI 1.08–1.58), and duration of positive pressure ventilation (OR 1.10; 95% CI 1.03–1.23). No patient had pulmonary embolism or death due to neck vein DVT in our study. Patients with neck vein DVT did not have a higher mortality compared to those who did not. **Conclusion:** The incidence of non-lower limb DVT is higher compared to lower limb DVT in a setting of prolonged ICU stay population. Internal jugular vein was the most common location of DVT similar to the study reported by Lamotagne et al. Reasons for the higher incidence included risk factors unique to ICU settings including central venous catheter days, duration of positive pressure ventilation, and the presence of blood stream infection.

**References**


**Clinical Profile and Outcomes of Patients Presenting with H1N1 Pneumonia and Respiratory Failure at a Tertiary Care Center of Central India**

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Results

To describe the clinical profile and outcomes of patients presenting with H1N1-related pneumonia and respiratory failure at our centre.

Materials and methods: A retrospective study was undertaken during the recent outbreak of H1N1 influenza in central India in 2022. Records of all patients admitted at MRTB hospital, Indore, during the outbreak with diagnosis of H1N1 pneumonia were reviewed. Patients without respiratory failure were excluded. Details like symptom duration, relevant investigations, treatment received, level of respiratory support required, and final outcome were analyzed.

Results: Total 32 patients were included in the study. Mean age was 45 years with 50% patients being male. Mean duration of complaints was 7 days with majority having fever, shortness of breath, and cough. Nearly 1/3rd patients had one or more comorbidities with diabetes being the most common comorbidity. All patients received oxygen and respiratory support as per the requirement. Mean SpO2 at presentation was 77% on room air. Mean duration of hospital stay was 10 days. About 56% patients had severe ARDS. Overall mortality was 28% while mortality in severe ARDS was 50%.

Conclusion: In our study conducted on H1N1 pneumonia-associated respiratory failure diabetes was associated with severe disease. About 56% patients had severe ARDS, and overall mortality was 28%.

Discussion: This is one of the few studies from central India to report data from H1N1 ARDS patients. Acute respiratory distress syndrome is associated with a high mortality rate, and there is no specific treatment for this fatal condition. Our study correlates with literature from across the world that shows similar mortality with increasing death rates corresponding to severity of ARDS.

Keywords: Acute respiratory distress syndrome, Central India, H1N1, Swine flu.

References

**In vitro Antimicrobial Susceptibility of Gram-negative Clinical Respiratory Isolates to Beta Lactam/Beta Lactamase Inhibitor (BL/BLIS) and its Comparators (ATLAS 2020 Data)**

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**Introduction:** Gram-negative antimicrobial resistance is a concern in India. Antimicrobial Testing Leadership and Surveillance (ATLAS), which is the integration of three surveillance programs (TEST, AWARE, and INFORM) initiated in 2004, detects trends in multi-drug resistance longitudinally over time. This surveillance analysis reports *in vitro* antimicrobial activity and susceptibility data for a panel of agents against respiratory isolates of *Enterobacteriales*, *Pseudomonas aeruginosa*, and *Acinetobacter spp.*

**Methods:** Nonduplicate clinical (respiratory) bacterial isolates (*n* = 2790) were collected in 2020 from nine Indian tertiary care centers, of which 717 (26%) were Gram-negative bacteria. Susceptibility was confirmed at International Health Management Associates (IHMA) laboratory using supplied broth microdilution panels (Microscan), according to the Clinical and Laboratory Standards Institute (CLSI) guidelines for all antibiotics except Colistin (EUCAST guidelines) and Tigecycline (FDA defined MIC breakpoints).

**Results:** IR, Intrinsic resistance Susceptibility to the BL-BLI was 53–75% for *Enterobacteriales* and 76–83% for *Pseudomonas aeruginosa* with highest susceptibility to Ceftazidime–avibactam. The susceptibility for *Acinetobacter spp.* was poor (4–17%). Susceptibility to carbapenem was 58–73% for *Enterobacteriales* and *Pseudomonas aeruginosa* and only 4% in *Acinetobacter spp.* Highest susceptibility was noted for Tigecycline. The susceptibility to colistin was reduced in *Enterobacteriales* (85%), while it was 100% for *Pseudomonas aeruginosa* and 97% for *Acinetobacter spp.*

**Conclusion:** BL-BLIs can be used as wherever susceptible for treatment of severe respiratory tract infections like hospital-acquired/ventilator-associated pneumonia (HAP/VAP). Ceftazidime avibactam and Cefoperazone sulbactam can be considered for management of HAP/VAP caused by susceptible *Enterobacteriales* and *Pseudomonas aeruginosa* as they showed overall good susceptibility. The use of colistin may be limited by the lack of CLSI susceptibility breakpoints, reduced tissue penetration in the lung, and safety concerns. Reduced susceptibility to colistin possibly due to mcr/Mgr B mutants in *Enterobacteriales* may also be a concern. Increased resistance rates and limited treatment options in *Acinetobacter spp.* stresses the need for good infection control practices.

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**Extracorporeal Therapies to Tame the Beast-Paraquat Poisoning: So Many Questions; So Few Answers**

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**Introduction:** Paraquat (PQ; 1,1-Dimethyl-4,4'-bipyridinium dichloride) is a commonly used herbicide for suicidal consumption in India owing to easy access over the counter. It metabolizes to generate free radicals causing multi-organ damage, especially AKI and ARDS. There is no clear data on the nation-wide incidence of paraquat poisoning. Outcomes in PQ poisoning are dismal with a mortality rate ranging from 50 to 90% despite supportive therapy owing to the lack of specific antidote. The number of cases recorded at our ICU in the last 5 years is around 70, and we have had similar experience with mortality rates. Many *in vitro*, animal, and human studies have tried extracorporeal therapies in PQ poisoning cases, and there were mixed outcomes with respect to the type of filter and timing of initiation of extracorporeal therapy on survival. We have started using Hemoperfusion filters since December 2020 with charcoal-based hemadsorbent filters and resin-based (HA230) adsorbent filters since October 2021. We have found improved outcomes since. We intend to present our ICU data.

**Objectives:**
- To study the demographic and clinical profile of patients admitted with paraquat poisoning in our ICU.
- To study the effect of Hemadsorbent filters (charcoal and HA230) and timing of initiation on the outcomes in acute paraquat poisoning.

**Materials and methods:** We conducted a retrospective observational study from December 2020 to September 2022. The study included all the patients admitted to our ICU with Paraquat poisoning. Data acquisition were done from case records. Demographic, clinical, and treatment details, including details of extracorporeal therapies were noted. Amount of PQ consumed was documented as per history. Findings were tabulated and analyzed.

**Results:** A total of 35 patients were studied, which included 29 males (82%) and 6 females (12%). Mean age was 31 years. Average APACHE-II score was 9. Mean...
A total of 250 sample data were collected. Pearson’s correlation was used to quantify the relationship between the variables. SpO2 values of between 85% and 97% were considered, and >97% were excluded from the analysis because the oxyhemoglobin dissociation curve is flat above these levels. For variable flow oxygen delivery devices, \( \text{FiO}_2 = 20\% + (4 \times \text{oxygen l/min}) \) was considered. This study was approved by the IEC (REF NO: BVDUMC/IEC/09, Dated: 30/06/2021). This study is also registered with the Clinical Trials Registry-India (CTRI) with registration number being CTRI/2021/09/036210.

**Results:** A total of 250 sample data were collected. Pearson’s correlation was used to quantify the relationship between the variables. The study showed a positive correlation, \( r = 0.732 \) (p < 0.01) between SF ratio and PF ratio. And also Pearson’s correlation between the SF ratio and PF ratio was analyzed in invasive ventilation patients and showed a correlation \( r = 0.669 \) (p < 0.01). In noninvasive ventilation patients \( r = 0.803 \) (p < 0.01), in acidosis patients \( r = 0.789 \) (p < 0.01), and in alkalosis patients \( r = 0.673 \) (p < 0.01). ROC curve was constructed and area under curve measured to find out the cutoff value of SpO2/FiO2 (SF) ratio. SF threshold values were found as 252 and 321 for corresponding PF values of 200 and 300, respectively, with a sensitivity and specificity of 68.9% and 95% for 200 and 69.8% and 97.5% for 300, respectively.

**Conclusion:** In patients with acute hypoxemic respiratory failure noninvasive SF ratio can be used as surrogate to invasive index PF ratio in all modes of oxygen supplementation and also they correlate well in both acidosis and alkalosis.

**Impact of Admission Serum Levels of Calcium, Magnesium and Phosphorus on Clinical Outcomes in Critically Ill Patients: A Retrospective Analysis**

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**Objectives:** Electrolyte abnormalities are common in patients admitted to the intensive care unit (ICU), due to the complex pathophysiological process involved in critical illness. Calcium, magnesium and phosphorus also have multiple implications in human physiology. We intend to highlight the clinical significance of these electrolyte abnormalities in critically ill patients by identifying their prevalence and impact on clinical outcomes like survival, length of stay (LOS) in the ICU, and duration of mechanical ventilation.

**Materials and methods:** A retrospective study was conducted among critically ill adult patients who were admitted to the intensive care unit of a Tertiary Care Centre, AIIMS, New Delhi, from January 2019 to December 2019. Case records of all patients admitted to the ICU within this period were scrutinized, and patients with age > 18 years, SOFA score > 2, and death within 24 hours of admission and at least one recorded value of calcium, magnesium and phosphorus at admission or during the first 48 hours of ICU stay were included. The FiO2 which was administered to the patient at that point was also documented. A second sample was tested when the participant deteriorates needing escalation of respiratory support or 24 hours after admission, whichever was the earliest. The PF ratio and SF ratio was calculated using the documented variable – SpO2, FiO2, PaO2, and analyzed to correlate the relationship. ROC curve was constructed and area under curve measured to find out the cutoff value of SpO2/FiO2 (SF) ratio. Pearson’s correlation was used to correlate the relationship between the variables. SpO2 values of between 85% and 97% were considered, and >97% were excluded from the analysis because the oxyhemoglobin dissociation curve is flat above these levels. For variable flow oxygen delivery devices, \( \text{FiO}_2 = 20\% + (4 \times \text{oxygen l/min}) \) was considered. This study was approved by the IEC (REF NO: BVDUMC/IEC/09, Dated: 30/06/2021). This study is also registered with the Clinical Trials Registry-India (CTRI) with registration number being CTRI/2021/09/036210.

**Results:** A total of 250 sample data were collected. Pearson’s correlation was used to quantify the relationship between the variables. The study showed a positive correlation, \( r = 0.732 \) (p < 0.01) between SF ratio and PF ratio. And also Pearson’s correlation between the SF ratio and PF ratio was analyzed in invasive ventilation patients and showed a correlation \( r = 0.669 \) (p < 0.01). In noninvasive ventilation patients \( r = 0.803 \) (p < 0.01), in acidosis patients \( r = 0.789 \) (p < 0.01), and in alkalosis patients \( r = 0.673 \) (p < 0.01). ROC curve was constructed and area under curve measured to find out the cutoff value of SpO2/FiO2 (SF) ratio. SF threshold values were found as 252 and 321 for corresponding PF values of 200 and 300, respectively, with a sensitivity and specificity of 68.9% and 95% for 200 and 69.8% and 97.5% for 300, respectively.

**Conclusion:** In patients with acute hypoxemic respiratory failure noninvasive SF ratio can be used as surrogate to invasive index PF ratio in all modes of oxygen supplementation and also they correlate well in both acidosis and alkalosis.
was done to determine the effect of ionized calcium, magnesium, and phosphorus on the survival outcome after adjusting the model for age, gender, APACHE, and SOFA scores. Linear regression was done to predict the effect of these electrolytes on duration of mechanical ventilation and LOS in the ICU. Results: The mean age of the patients was 43.31 ± 20.2 years, of which 48% were male and 52% were female. Mean APACHE II and SOFA scores were 19.8 and 8.1 respectively. There are 86.4% and 13.6% received enteral and parenteral feeding respectively. There are 17.6% patients received diuretics and 27.2% received dialysis. There are 86.4% patients received mechanical ventilation (mean 10.82 days). There are 84.2% were admitted with medical emergency. Overall survival of the patients was 61.6% (Standardised mortality ratio with respect to APACHE II is 0.78). There are 14.4% (18 out of 125) patients had hypophosphatemia and had 15.8% increased risk of mortality with respect to those with normal levels. Hyperphosphatemia was seen in 40% (50 out of 125) patients who had 72% increased risk of mortality with respect to those with normal levels (AOR: 0.277, 95% CI: 0.122–0.629, p = 0.002). Hypocalcaemia was seen in 70% (88 out of 125) patients who had 18.3% increased risk of mortality than those with normal calcium levels. No patient had hypercalcaemia. 27% (34 out of 125) patients had hypomagnesemia who had 13% better chances of survival than those with normal levels. 14.4% (18 out of 125) patients had hypermagnesemia with 42.1% increased risk of mortality as against those with normal levels. As per linear regression models, decreased magnesium and phosphorus levels increased the LOS in the ICU as well as duration of mechanical ventilation, though not statistically significant. Conclusion: After adjusting for age, gender, SOFA and APACHE II scores, hyperphosphatemia has a role in prediction of ICU outcomes and can be used as a component of prognostication tools. Levels of phosphorus, magnesium and calcium should be given appropriate attention, and optimization of the same can help in minimizing the length of ICU stay and duration of mechanical ventilation.

Methotrexate Toxicity: A Dreaded Complications Secondary to Idiosyncratic Drug Reaction

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Introduction: Methotrexate was initially developed as an anticancer drug used in chemotherapy. A low dose therapy was found to be effective inducing remission in patients of Rheumatoid arthritis. Methotrexate acts by inhibiting dihydrofolate reductase enzyme which catalyses conversion of dihydrofolate to active tetrahydrofolate. Tetrahydrofolate is required for denovo synthesis of thymidine which is a component of DNA. Adverse effects of methotrexate are less common with low doses used for autoimmune diseases. Our patient presented with classical features of bone marrow suppression and hepatotoxicity despite once weekly dose of methotrexate. Case report: A 60-year-old male, known patient of rheumatoid arthritis, hypertension, and old CVA presented with history of generalized weakness, oral mucosal bleeding, hematuria, hematochezia and hemoptysis for 3 days. He was on weekly methotrexate 15 mg, prednisone 5 mg and hydroxychloroquine for the last 5 months. He had fever with cough for 6 days and was treated Amoxiclav and Montelukast. Initial laboratory parameters revealed hemoglobin of 8.4 gm/dL, WBC count of 200 cells/cu.mm3, platelets of 4000 cells/cu.mm3, PT-24.5 seconds, APTT >240 seconds, INR 2.0, reticulocyte count-0.2%, SGOT-416, SGPT-690, LDH-468, total bilirubin 4.2mg/dL, direct bilirubin 1.7mg/dL and peripheral smear showed microcytic hypochromic anaemia. A diagnosis of methotrexate toxicity was considered in view of pancytopenia and hepatitis. He had melena on admission hence pantozaprole and Octreotide infusion was commenced. In view of bleeding diathesis patient received 4 RDP and 4 FFP transfusion. Empirical Antibiotics were started for febrile neutropenia. Leucovorin was commenced along with Filgrastim (G-CSF) and Romiplostim. Blood Culture grew Pseudomonas which was pansensitive, and sputum culture revealed Acinetobacter sensitive to Colistin hence commenced on appropriate antibiotics. Bleeding manifestations stopped with normalization of platelet count and coagulation parameters. He had headache and drowsiness on 4th day of ICU stay so CT Brain was done which showed acute on chronic subdural hemorrhage which was managed conservatively. Interval CT scan showed no increase in size of hemorrhage. Filgrastim and Romiplostim were stopped after increasing trends of WBC and Platelets. He made a good recovery and was discharged with folic acid and vitamin supplements.

Conclusion: Penicilllin and its analogues decrease the elimination of methotrexate and increase its concentration. Our patient had taken Amoxicillin and Clavulanate for upper respiratory tract infection. The adverse effects of Methotrexate include stomatitis, leucopenia, hepatitis, interstitial pneumonitis and severe skin rashes. In this case, due to neutropenia, he had blood stream and lower respiratory tract infection. Thrombocytopenia and hepatitis led to bleeding manifestations. Discontinuation of the drug along with administration of Leucovorin, Filgrastim and Romiplostim improved the counts which helped in termination of bleeding manifestations and resolution of infection aided by antibiotics. Leucovorin is the reduced form of folic acid which bypasses the usual pathway and provides a source of folate for dividing cells. Glucarpidase is a newer drug for methotrexate toxicity that inactivates methotrexate.

References

A Comparative Interventional Study on Current Surviving Sepsis Guidelines Regarding Fluid Resuscitation Therapy in Critically Ill Early Neutropenic Septic Shock Patients

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DOI: 10.5005/jp-journals-10071-24411.65

Objective: To compare the effect of peripheral perfusion guided therapy using capillary refilling time vs lactate guided fluid resuscitation therapy in critically ill early neutropenic septic shock patients. primary end point was 90-day mortality and SOFA score at 48 hours. Secondary end point was SOFA score at 96 hours,
Incidence and Etiology of Diarrhea in Critically Ill Adult Patients: An Observational Study

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Introduction: Diarrhea is common in ICU. Studies regarding diarrhea are rare in critically ill adult patients.

Objectives:
- To determine the incidence and etiology of diarrhea in critically ill adult patients, specifically to estimate the incidence of Clostridium difficile associated diarrhea
- To study the adverse effects of diarrhea in ICU patients.

Materials and methods: Consecutive patients (>18 years) from a mixed ICU of a teaching institute with diarrhea (3 or more loose stools per day) with onset of diarrhea after 72 hours of ICU admission included. Patients with GI bleed, stoma and metronidazole were excluded. stool samples were subjected to microscopy, culture and Clostridium difficile toxin A and B by ELISA. Data collected included admission characteristics, enteral nutrition details, antibiotics and other drugs administered, and clinical and laboratory effects during first 7 days of diarrhea onset. Organ support therapies and ICU outcomes were noted. Admission characteristics, incidence of diarrhea and the etiology were analyzed using descriptive statistics. Factors predisposing to diarrhea, adverse effects and outcomes of diarrhea were analyzed and correlated with etiology. The study was approved by the Institutional Ethics Committee; waiver of consent was granted. Results: Between October 2021 to September 2022, 278 patients were screened; 69 patients were identified. Out of these, 26 were excluded; 17 had GI bleed, 6 with colostomy/ileostomy and 3 on Metronidazole. Hence, 43 patients were identified (Incidence 15.5%). Median age 42 years (31–58); 65% were male, APACHE II score was 19 (12–24), SOFA score 8 (5–11) and 33 (76.7%) had medical diagnosis. Co-morbidities were none (48.8%), 1 (30.2%), 2 (14%) and ≥3 (7%). Admission diagnoses were pancreatitis 9 (20.9%), liver diseases 6 (13.9%), pneumonia 5 (11.6%), obstetric 4 (9.3%), urosepsis 3 (6.9%), acute febrile illness 3 (6.9%) and others 13 (30.3%). The clinical features of diarrhea included fever 11 (25.6%), vomiting 10 (23.3%), abdominal distension 11 (25.6%) and pain/tenderness 4 (9.3%). Diarrhea started 10 (7–18) days after ICU admission and lasted for 6 (3–10) days. Feed related factors were continuous feed 27 (62.8%) vs bolus 14 (32.6%) (p = 0.005), hyperosmolar feed (>1kcal/mL) 28 (65.1%) vs hyposmolar 8 (18.6%) and iso-osmolar 7 (16.3%) (p = 0.005), nasogastric feed 32 (74.4%) vs nasojejunal 9 (20.9%) (p = 0.0001), and formula feeds 33 (76.7%) vs hospital made blended diet 8 (18.6%) (p < 0.0001). Feed was changed in 9 (20.9%) and interrupted in 12 (27.9%). Among medications predisposing to diarrhea, antibiotics were received by all; median use before diarrhea onset was 12 (8–17) days. Antibiotics used included Carbapenems 37 (86%), β-lactams 19 (41.9%), Glycopeptides 7 (69.8%), Tetracyclines 15 (34.9%), and Polypeptides 23 (53.5%). Other drugs were laxatives 7 (16.3%), prokinetics 16 (37.2%) and hyperosmolar drugs 18 (41.9%). Clostridiodies difficile toxin positive by ELISA in 17 (39.5%). Effects were TLC worsened in 14 (32.6%), hypalbuminemia 5 (11.6%), BUN increased 21 (48.8%), creatinine increased 13 (30.2%) hyponatremia 8 (18.6%) and INR increased 6 (14%). Adverse effects of diarrhea included the new need for vasopressors 10 (23.3%) and dialysis in 2 (4.7%), increased ventilator support 2 (4.7%), and skin maceration 4 (9.3%). 18 (41.9%) patients expired; ICU length of stay (LOS) 34 (22–62) days. During this period, overall ICU mortality was 36.6% and LOS was 16 days.

Conclusion: Diarrhea occurs in 15.5% of ICU patients. Infective etiology is seen in 39.5%, and it increases morbidity and ICU length of stay.
Detection of Hemodynamic Events During the Implementation of a Novel indigenous Tele-ICU System – An Observational Study

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Objectives: To assess the incidence of hemodynamic events and their outcomes managed by remote monitoring through the implementation of a novel indigenous Tele-ICU system. Materials and methods: This observational study was conducted for a period of 3 months by monitoring 11 ICU units in 9 hospitals, of which 3 being tertiary care and 6 peripheral care centers, remotely using the hub and spoke method by intensivists from the Tele-ICU hub, an annexe of the Department of Critical Care Medicine at Aster Ramesh Hospitals, Vijayawada. The study included 209 patients in ICUs and high dependency unit (HDUs) admitted for various critical illnesses. Results: A total of 314 events were detected and reported for immediate management. The most commonly observed event was Tachycardia (30.56%) followed by Bradycardia (19.42%), Hypoxia (12.73%), non-sustained ventricular tachycardia (7.64%) and Sinus tachycardia (7%). Life-threatening events like Ventricular tachycardia and Ventricular fibrillation occurred in 9.3 % (n = 19) and 0.98% (n = 2) cases respectively. Among these cases with life-threatening rhythms (VF, VT) 19 cases were revived and 2 cases couldn’t be revived. The overall mortality rate was 6.9 % (n = 14) of which 64.3 % (n = 9) cases were due to bradycardia and 35.7 % (n = 5) cases each of Ventricular fibrillation, Ventricular tachycardia, Tachycardia, Sinus Tachycardia and Sinus Bradycardia. Conclusion: Indigenous Tele ICU system if designed and implemented effectively has the potential for being used as an effective tool for the detection of life-threatening haemodynamic events and thereby help in reducing in-hospital cardiac arrest (IHCA) in tertiary and peripheral hospitals.

Feasibility of Early Extubation Using HFno Compared with Conventional Method in Hypoxemic Respiratory Failure: A Randomized Controlled Trial

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Objectives: Invasive mechanical ventilation (IMV) is a lifesaving therapy but prolonged ventilation is associated with increase in mortality and morbidity. Application of noninvasive ventilation after early extubation have been studied extensively in hypoxemic as well as hypercapnic respiratory failure but there is a limited data available so far on the use of high-flow nasal oxygenation (HFNO) as a mean to facilitate the process of early liberation from IMV in hypoxemic respiratory failure patients. This study aims to assess the feasibility of early extubation followed by immediate HFNO compared with conventional weaning in patients with hypoxemic respiratory failure. Methods: The present randomized, controlled, open-label trial enrolled 80 adult patients (40 in each group) requiring IMV for more than 48 hours for hypoxemic respiratory failure. When the treating clinician judges that the patient is ready to be weaned based on clinical and rapid shallow breathing index (RSBI) criteria, the patient was given spontaneous breathing trial (SBT). In Conventional group, SBT was given on achieving P/F ratio of ≥200, while in HFNO group, it was given on achieving P/F ratio of ≥150 with PEEP of ≥8. All Patient were extubated after successful SBT and put on oxygen supplementation. Patients in HFNO group, received O2 through HFNO at 60lt flow and 100% FiO2 and titrated to maintain SpO2 of ≥94% and RR ≤30. In conventional group, patients received oxygen via venturi mask with flow titration to maintain SpO2 of ≥94%. In case of failed extubation based on clinical parameters and unacceptable ABG assessed by treating clinician, patient will be reintubated again and noted as weaning failure (if reintubated within 48 hours of extubation) and continued further mechanical ventilation and weaning based on conventional method. All the pts were monitored for the signs of respiratory distress throughout the ICU stay. Primary objective of this study was to compare weaning failure (defined by need of reintubation within 48 hours of extubation) and secondary objectives were to compare total ventilation days, incidence of ventilator associated pneumonia (VAP), ICU length of stay, invasive ventilation free days and all-cause mortality during ICU stay. Results: Among 40 patients in each group, 5 (12.5%) patients experienced weaning failure in HFNO group and 10 patients (25%) in conventional group (p = 0.252). The median (IQR) invasive mechanical ventilation free days were significantly increased in HFNO group [5 (4–6)] compared with conventional weaning [4, (2.25–6.75)] (p = 0.033). No statistically significant difference was found in total ICU length of stay, total invasive mechanical ventilation days, VAP incidence and all-cause mortality between the 2 groups. Reintubation after 48 hours of extubation was needed in 1 patient (2.5%) in HFNO group and 3 patients (7.5%) in conventional group (p = 0.615). Conclusion: Among hypoxemic respiratory failure patients, early extubation on HFNO is a potential alternative to the conventional method of weaning. Early weaning on HFNO significantly increased reduces the IMV-free days compared to conventional group.

The Validity of ROX Index in Comparison to APACHE II in the Prediction of Early, Late, and Non-response to Non-invasive Methods of Ventilation in Patients with COVID-19

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DOI: 10.5005/jp-journals-10071-24411.69

Introduction: ROX index is a simple score derived by the ratio of oxygen saturation to the fraction of inspired oxygen (SPO2/FIO2) and respiratory rate. We conducted this retrospective study evaluating
Community acquired pneumonia (CAP) is one of the most common infectious diseases, and is an important cause of morbidity and mortality among the elderly worldwide present with chronic cardiac disease. Neutrophil Lymphocyte Ratio (NLR) and CURB-65 score are known to be the best predictor of intubation. Upon ROC analysis, the study found the AUC of 0.902 for NLR, 0.922 for CURB-65 score and 0.931 for PSI score. The presence of liver or renal involvement, and sepsis predicts delayed response to therapy in covid patients. Further studies are required to confirm the utility of the ROX index to determine whether the serial ROX index can predict response to therapy in patients on NIV and HFNO in severe COVID disease admitted to ICU. Methods: This study was conducted on patients admitted to a tertiary care university teaching hospital, Mysuru, from July 2020 to November 2020. Data were extracted from records manually. It included patient’s demographics like age, sex, comorbid diseases like diabetes, hypertension, chronic lung diseases, malignancy, chronic liver diseases, chronic kidney disease, and heart failure; vitals like heart rate, blood pressure, and respiratory rate at admission and every 24 hours; laboratory tests like renal function tests, liver function tests; hematomatological parameters like total blood count, coagulation profile, lactate dehydrogenase levels, ferritin levels, d-dimer values, arterial blood gas analysis and APACHE II (Acute physiology and chronic health evaluation) score on admission, presence or absence of MODS and septic shock. Serial ROX index was extracted from the day of admission to day 3 in all patients. Results: A total of 118 patients with RTPCR-confirmed diagnosis of COVID-19 were enrolled in the study, of which 38 were early responders, 34 were late responders, and 46 were non-responders. Multinomial logistic regression between the groups late vs early showed that ROX index scores on admission OR (95% CI): 0.468 (0.293–0.745), day 1 [OR (95% CI): 0.599 (0.412–0.872), and day 2 OR (95% CI): 0.552 (0.358–0.851) were associated with reduced risk of treatment failure. Multinomial logistic regression between the groups non-vs early showed that ROX index scores on admission OR (95% CI): 0.39 (0.23–0.663), day 1 [OR (95% CI): 0.472 (0.306–0.729)], and day 2 [OR (95% CI): 0.502 (0.307–0.82)] were associated with reduced risk of treatment failures. APACHE II scores [OR (95% CI): 1.216 (1.1024–1.341)], sepsis [OR (95% CI): 8.365 (1.3956–50.141)] and chronic cardiac disease [OR (95% CI): 3.829 (1.0252–14.3)] were associated with associated reduced risk of treatment failure. Upon ROC analysis for early vs late responders, we found that the ROX index on day 1 had the highest sensitivity (89.66%) and negative predictive value (92.11%) while having the least specificity (67.31%) and the ROX index on admission had the highest specificity (74.68%) and positive predictive value (60.78%). APACHE II scores on admission were found to be the best predictor of intubation (AUC = 0.847) but had the least positive predictive value (56.90%). A significant difference in survival possibilities was observed between high and low ROX cut-offs scores (cut-off: 0.5) following Kaplan-Meier analysis (log-rank test; p = 0.021).

Conclusions: The ROX index can be used to predict response to high-flow nasal oxygenation and non-invasive mechanical ventilation in COVID-19 pneumonia and is non-inferior to APACHE II. The presence of liver or renal involvement, and sepsis predicts delayed response to therapy in covid patients. Further studies are required to confirm the above findings.

Neutrophil Lymphocyte Ratio and Curb-65 Score as a Prognostic Marker of Mortality and Morbidity in Elderly Adults with Community Acquired Pneumonia

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Background: Community acquired pneumonia (CAP) is one of the most common infectious disease, and is an important cause of morbidity and mortality among the elderly worldwide present study aimed to investigate the usefulness of Neutrophil Lymphocyte Ratio (NLR) and CURB-65 as a biomarker of CAP. Material and method: Present diagnostic comparative study was conducted among the patients more than 18 years of age with community acquired pneumonia, attending Department of General Medicine of AVMC & H. Obtained informed and written consent from the patients, detailed history examination and investigations and the NLR ratio, CURB-65 score and PSI calculated and compared. All data were collected by investigator, was analyzed statistically to find the level of significance of the study. Results: There are 204 patients included with mean age of 57.11 ± 16.35 years of age. Among them, 60.3% were male patients and 39.7% were female. On comparison of the scores with Risk group, we found a significant difference in the mean, with the 3rd risk group the mean levels were significantly higher compared to group II and group I. (p < 0.05) on Pearson’s correlation the NLR was significantly positively correlated with CURB-65 score and PSI score in the present study. (p < 0.05) on ROC analysis, the study found the AUC of 0.902 for NLR, 0.922 for CURB-65 score and 0.931 for PSI score. (p < 0.05). Conclusion: Study concludes that the NLR is an important biomarker for community acquired pneumonia. Also, the NLR is significantly correlated with the CURB-65 and PSI score positively. NLR is simple and useful tool to assess the outcome of the patients with CAP.

A Randomized Open Label Control Study Assessing the Tolerability of Trophic Feeds and Optimal Feeds in ICU Patients on Vasopressor Support

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Introduction: Critically ill patients are often hemodynamically unstable owing to hypovolemia, cardiac dysfunction, sepsis leading to organ dysfunction and death. Enteral nutrition therapy, when applied properly and early, reduces the incidence of unfavorable outcomes in critically ill patients. In such patients who are on vasoactive drugs controversies exist relating to prescription of enteral nutrition. It is important to emphasize that the use of vasopressor per se should not hinder commencement of enteral nutrition. Current consensus among experts determines hemodynamic instability as a contraindication to any nutritional strategy and enteral nutrition can be commenced once clinical stabilization is achieved. Objective: To identify the safety and tolerability of prescription of trophic feeds and optimal feeds in critically ill ICU patients on vasopressor support. Methods: A randomized control study was conducted at Medical Intensive Care Unit, Aster CMI Hospital, Bengaluru for a period of 1 year from September 2021 to September 2022 involving 60 critically ill patients on vasopressor support for at least 48 hours. Maximum noradrenaline requirement 0.3 µg/kg/min, lactate < 2. Those with refractory shock, requiring progressive elevation of vasoactive drugs, ho significant abdominal vascular disease (ischemic colitis, mesenteric ischemia, aortic dissection), active GI bleed, and intestinal obstruction were excluded from our study. Patients were randomized into two groups One group of patients will be started on trophic feeds and other groups on optimal feeds (60–70% of the target) enteral nutrition feeds. Patients in both groups were assessed for gastric residual volume, regurgitation, aspiration, constipation, and diarrhea. Results: The age of the participants was in the range 22 years – 64...
years and 41 years – 82 years for group A and group B, respectively, APACHE distribution amongst two groups group A 20–48, and Group B 30–50. The requirement for second vasopressors was 60% in both groups. In group A 60% required ventilatory support and in group B 80%. Gastric residual volume was assessed every 6QH over 48 hours (If aspirate > 300 mL, feeds would be discontinued and reassessed). There was no incidence of aspiration or constipation. There were 20% of patients in group B had diarrhea. Around 40% of the individuals in group A were declared dead or brain dead whereas only 20% of the individuals in group B had died in ICU care. Overall, there was a twofold increased risk of mortality for group A compared to group B, but it was not shown statistically significant. Discussion: Previous studies have shown early enteral nutrition with trophic feeds with slow escalation has shown benefits in patients on vasopressor support. We have compared trophic and optimal feeds (60–70% of total target), tolerability parameters were assessed, and shown that those who were started on optimal feeds tolerated well without any signs of intolerance or bowel ischemia. Conclusion: Early initiation of optimal feeds in patients with shock on a stable dose of vasopressors (receiving doses of <0.3μg/kg/min noradrenaline) is tolerated well. Further larger randomized trials to investigate the possible beneficial effects of this intervention are needed. Acknowledgement: I am extremely thankful to my consultants Dr. Prakash Doraiswamy, Dr. Shashank MR for their constant support, encouragement and valuable guidance for my presentation. I thank Mr. Bharatnag for his guidance regarding the statistical analysis. I would like to thank all my colleagues and ICU staff for their support and co-operation.

References

The overall time to successful intubation, time to successful 1st attempt intubation, overall success rate and change in angulation between cervical vertebra C1 and C2 as measured during intubation by fluoroscopy

<table>
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<th>Parameters</th>
<th>Group ETB, n = 43</th>
<th>Group ETS, n = 43</th>
<th>p-value</th>
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<td>Time to successful intubation, mean ± SD, in seconds</td>
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<td>52.395 ± 32.85</td>
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<td>Time to intubation with respect to each CL grade</td>
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<td>Mean ± SD, in seconds</td>
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<td>(includes 2nd and consequent attempts to intubate)</td>
<td>40/43 (93.02%)</td>
<td>41/43 (95.34%)</td>
<td>0.212</td>
</tr>
<tr>
<td>Fluoroscopy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At baseline (T1)</td>
<td>9.36 ± 0.665</td>
<td>9.57 ± 0.583</td>
<td>0.160</td>
</tr>
<tr>
<td>At time of ETI (T2)</td>
<td>8.10 ± 0.0552</td>
<td>8.23 ± 0.749</td>
<td>0.411</td>
</tr>
<tr>
<td>Change in angulation (ΔT)</td>
<td>1.31 ± 0.464</td>
<td>1.33 ± 0.471</td>
<td>0.857</td>
</tr>
</tbody>
</table>

Intubation Times with the Bougie Versus Stylet in the Immobilized Cervical Spine: A Randomized Trial

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Introduction: In cervical spine injury patients, the neck is stabilized by neck collar and traction, limiting neck movements. This leads to failure in aligning the laryngeal, pharyngeal, and oral axes, making the visualization of the larynx difficult. Endotracheal intubation (ETI) in patients with an immobilized cervical spine is often challenging, urging the use of airway adjuncts like bougie and stylet and a video-laryngoscope (VL). Owing to the scarcity of comparative literature, we aimed to compare the intubation characteristics when using either a bougie or a style with a VL in these patients. Methods: This randomized controlled study involved eighty-six adults ASA I/II patients with cervical spine immobilized with a collar or traction, scheduled for cervical spine surgery. ETI was performed with the C-MAC VL, assisted with bougie (Group ETB) or stylet (Group ETS). The primary outcome was time for a successful ETI. First-attempt success (FAS) rate, overall successful ETI, cervical spine motion detected using fluoroscopy and complications were secondary outcomes. Any movement of the atlantooccipital joint during ETI was noted by fluoroscopy image at two-time points; T1-at the neutral position (during bag and mask ventilation after induction) & T2-point of insertion of the ETI through the glottis aperture. Fluoroscopy data were analyzed only for successful ETI. Results: The time for ETI in group ETB was 52.38 ± 20.85 sec (n = 43), and in group ETS was 52.39 ± 32.85 sec (n = 43), p = 0.958. There was no significant difference in FAS rate, overall success of intubation or cervical spine movement between the groups. No complications were encountered. Discussion: In patients with an immobilized cervical spine, there was no significant difference in the intubation times when comparing the bougie and the stylet. The FAS rate was also similar in both groups with minimal motion at C1, and C2. Both bougie and stylet are equally useful adjuncts when used with a VL, while intubating patients in whom neck movements are restricted.
Reference


Spontaneous hemothorax in case of Russel viper bite in central Rural India: A case report

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DOI: 10.5005/jp-journals-10071-24411.73

Introduction: Viperine snake bite envenomation is one of the cause of acute kidney injury in the tropical area and coagulopathy with bleeding from site of bite, bleeding gums, epistaxis, hemoptysis, hematuria, hematemesis, and IC bleed. Rare manifestations like broad ligament bleed, hemoperitoneum, adrenal hematoma and peri nephric hematoma. To our knowledge until now 2 cases of hemothorax has been reported. A paediatric case of hemothorax was reported in a girl in India bitten by another vipersid species, Echis carinatus and another case after bite by Bothrops asper. Here, we report an unusual case of spontaneous massive hemothorax after Russel viper bite in central Rural India. Objective: To document rare complication of hemothorax in Russel Viper bite. Materials and methods: We present a case of a 60 years old male who presented to an ER after Russel viper bite. He was vitally stable and WBCT was more than 20 minutes in ER, he denied for history of bleeding from any other site. In ICU, he was treated with polyvalent snake antivenom, antibiotics and iv fluids. On day two, gradually patient’s urine output decreased along with steady rise of serum creatinine. On day 3, patient was complaining of dyspnoea and had tachypnoea. On examination air entry was absent on left hemithorax hence chest x-ray was done, suggestive of massive fluid collection with mediastinal shift to right. Diagnostic pleural tapping was done which was suggestive of blood on gross appearance, findings confirmed on microscopic examinations suggestive of RBCs. Immediate therapeutic thoracocentesis was done which revealed hemorrhagic effusion (hemothorax) and hemoglobin dropped to 7.1g/dL which was 11.6g/dL on admission and other lab results were as follows: platelet count: 98000/μl and creatinine:2.9mg/dl. The massive hemothorax required intercostal drainage of about 2.2 liters of blood and transfusion of 2 units of whole blood and 4 units of fresh frozen plasma. He had prolonged WBCT along with increase in BT, CT, PT/INR, activated PTT (aPTT) and fibrin degradation product, suggests haemostatic dysfunction. We concluded that venom induced coagulopathy along with haemorrhagins induced direct endothelial injury may be the possible mechanism of hemothorax. The venom of Russell’s viper activates Factor X, thereby inducing rapid thrombin formation in the presence of Factor V, calcium ions and phospholipids. Results: Patient improved clinically and had resolving lab parameters. On day 10 days of admission, had no signs of respiratory distress and normal saturation, hence thoracotomy tube removed. Chest X-ray showed obliteration of the left costophrenic angle with very small effusion. Discussion: Venomous snake bites are common in tropical countries and contribute to 3% of AKI in India. Snake venoms generally cause cellular injury through enzymes, polypeptide toxins, cytokines and/ or mediators. The snakes that cause renal failure produce venom that is either myotoxic or hemotoxic, resulting in rhabdomyolysis, intravascular haemolysis, DIC or haemorrhage. Plasmapheresis and blood exchange have been tried in snake envenomation, but it is not practical as they need to be performed before the venom fixes to the tissues. Identifying snake species has paramount importance in the appropriate management of snakebites and it is also important to further characterize clinical signs and symptoms of every snake species and prepare accordingly. Awareness raising activities targeted at the general public are therefore required to sensitize victims to visit health facilities at the earliest (before the venom is attached and fixed to tissues).

Keywords: Hemothorax, Russel vipherine bite.

References


Role of Veno-arterial Extracorporeal Membrane Oxygenation (Va-ECmo) Therapy in Aluminium Phosphide Poisoning: A Retrospective Analysis and Experience at a Multi-Speciality Hospital in Northern India

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DOI: 10.5005/jp-journals-10071-24411.74

Introduction: Aluminium phosphate poisoning (AIP) causes reversible myocarditis which can results in mortality. VA-ECMO support may prove life-saving therapy in cases of severe myocarditis with cardiogenic shock and can act as a bridge to recovery in aluminium phosphate poisoning. We collected and analyzed the data of patients with an alleged history of AIP, who were offered VA ECMO support. Our intensive care department is doing an average of 2.5–3 VA ECMO per month and is one of the largest ECMO centers in north India. Objectives: To analyze the role of VA ECMO therapy on the outcome of patients suffering from aluminium phosphide (AIP) poisoning.

• To analyze the outcome of Extracorporeal cardiopulmonary resuscitation (ECPR) offered to patients, who had witnessed cardiac arrest (in hospital) due to AIP.

Materials and methods: The present study is a retrospective analysis, conducted at a multi-specialty hospital in northern India. Case records of the patients with an alleged history of aluminium phosphate poisoning, who received veno-arterial Extracorporeal membrane oxygenation (VA-ECMO) therapy during the period of August 2019 to August 2022, were retrieved and data were analyzed. Patients who had a history of chronic cardiac disease, chronic kidney disease, uncontrolled diabetes, and any other chronic illness were excluded from the study. Results: The data were collected and entered in a Microsoft Excel spreadsheet and analyzed using SPSS software version 21.0 for windows. A total of 132 patients were admitted to our center with an alleged history of aluminium phosphate poisoning and out of these 74 (56.06%) patients were managed with routine conservative treatment only, while 58 (43.94%) patients were offered VA ECMO therapy in addition to routine conservative treatment. All these 58 patients who received VA ECMO, were categorized in a high-risk group as per intensive care protocol for AIP depending upon...
their pH, lactate levels, organ dysfunction, ionotropic requirement, and left ventricular systolic function. 20 (15.15%) out of 132 patients could not be survived. One patient was diagnosed within 3 hours of admission and received only conservative treatment; 2 patients were declared dead during treatment without ECMO support, although both of them were counseled about the need for ECMO support, but the family did not give consent due to financial constraints and 17 (29.31%) patients could not survive who received ECMO support. Out of 58 patients who received ECMO support, 10 patients were offered ECPR as they had an in-hospital cardiac arrest, and four patients (40%) survived by ECPR. Conclusions: VA-ECMO should be considered for severe myocarditis with cardiogenic shock due to aluminium phosphide poisoning and ECPR can also be attempted in cases of cardiac arrest due to AIP.

References

Assessment of Fluid Responsiveness Based on Ultrasonographic Measurement of Ratio of Internal Jugular Vein and Common Carotid Artery in Critically Ill Patients
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Objective: The objective of this study is to find a correlation between internal jugular vein (IJV) and common carotid artery (CCA) diameter ratio and stroke volume variation (SVV) measurement and find a cut-off value for the IJV/CCA ratio for estimating the volume responsiveness in critically ill patients. Materials and methods: Approval was taken from Institutional Ethics Committee and registration with the Clinical Trials Registry of India (CTR) was done. Type of study: An observational, prospective and cross-sectional study. Place of study: Indira Gandhi Institute of Medical Sciences, Patna, India. Period of study: 18 months. Sample size: 120 patients. Inclusion criteria: Patients aged 18–60 years, who were hemodynamically unstable (shock), and who needed a fluid challenge (according to the clinical assessment). Exclusion criteria: Age <18 years and > 60 years; Patients with heart failure; Abdominal hypertension; Pregnant females. Methodology: Written and informed consent was obtained from a relative of the patient. Demographic data and markers of shock and perfusion (heart rate, pulse volume, peripheral temperature, capillary refill time, blood pressure, urine output, and lactate levels) were recorded along with ultrasonographic measurements of UV diameter, CCA diameter, and stroke volume measurements, before and after administration of fluid boluses. The maximum allowable fluid bolus was predefined to be 30 mL/kg body weight. Results: We need a total of 120 patients for the study to have 80% power with a two-sided alpha level of 0.05. However, till now we have enrolled 15 patients with a mean age of 48.8 ± 10.7 years. In the preliminary analysis mean IJV/CCA ratio was 1.69 ± 0.76 and 1.90 ± 0.83, respectively, before and after fluid bolus administration. A significant correlation was observed between IJV/CCA ratio and SVV (r = 0.728, p < 0.01 before fluid administration, and r = 0.736, p < 0.01 after fluid administration). Conclusion: The ratio of the diameter of the Internal Jugular Vein (IJV) to that of the Common Carotid Artery (CCA), which can be easily calculated at the bedside, even during routine insertion of central venous catheters, can reliably predict the fluid responsiveness in the critically ill patients. Though promising, further studies are required to be completed and subjected to peer review before this technique can be universally applied.

Audit on Measurement and Outcome Analysis of COVID Markers in Intensive Care at George Eliot Hospital
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DOI: 10.5005/jp-journals-10071-24411.76

Introduction: A review of the literature links Covid markers like (IL-6, Ferritin, LDH, D-Dimer, and Procalcitonin) to disease progression in Covid-19. Hypoxia induces granulocytosis and fibrin degradation with progressive hyperinflammation which is manifested with a poor prognosis due to increased Leucocyte count, neutrophil count, thrombocytopenia, D-dimer, and LDH values. COVID markers after the literature review are surrogate precursors to the change of phenotype from L to H variant of COVID-19 which is a more life-threatening variant of COVID-19 (Gattinoni et al.) and early detection can lead to prognostication. Clinical Intervention is necessitated before diffuse alveolar damage and interstitial inflammation sets in as progressive hyperinflammation and subsequent hypoxia is definitely a determinant of Covid-19 progression and severity. Objectives: COVID markers blood (on admission, and weekly thereafter) is a local ITU guideline available on Intranet and Microguide. Our audit aims to check compliance with these guidelines. NICE rapid guidance in June 2020 also discussed the significance of Covid Markers in detecting secondary
Comparison of Efficacy and Safety of IntelliVent Adaptive Support Ventilation (IntelliVent®-ASV) with Conventional Modes of Ventilation in Critically Ill Patients

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Introduction and objective: IntelliVent®-ASV is a closed-loop ventilation mode that automatically adjusts ventilation and oxygenation settings in both passive and active patients, based on capnographic and plethysmographic inputs. The present study was done to compare the efficacy, safety & frequency of parameter changes, and length of ICU stay between IntelliVent®-ASV mode and conventional modes. Material and methods: About 147 patients on mechanical ventilation were randomized to remain on conventional ventilation modes ($n = 73$) or switched to IntelliVent®-ASV ($n = 70$) mode. ETCO2 (End-tidal CO2) and SpO2 (Oxygen saturation) were recorded in all patients. The number of manual adjustments and arterial blood gas (ABG) was recorded. Efficacy and Safety were assessed by the time spent in optimal ventilation ranges. Results: The time spent in optimal tidal volume was significantly high with IntelliVent®-ASV mode compared to conventional modes. (76.2 vs 71.43, $p$-value = 0.010). The frequency of change of ventilator settings manually was significantly lower for patients in the IntelliVent®-ASV group ($p = 0.019$). Discussion: The efficacy of a mode of ventilation is analyzed by the percentage of time spent in an optimal range of ventilation for tidal volume (VT), respiratory rate (RR), SpO2, and PETCO2. The IntelliVent® ASV group provides more efficient tidal volume than the other conventional modes of ventilation. These findings were similar to a study done by Bialais et which showed that the IntelliVent®-ASV mode of ventilation provided efficient tidal volume ($p$-value = 0.016) and SpO2 ($p$-value = 0.005) as compared to the conventional modes. The frequency of manual change of ventilator settings was significantly lower for patients in the IntelliVent® ASV group ($p = 0.019$). Reducing the frequency of change of manual ventilator settings lowers the burden on the healthcare workers. Conclusion: IntelliVent®-ASV provides more efficient tidal volume than the conventional mode. The efficacy and safety in terms of respiratory rate, SPO2, and ETCO2 control were similar in both modes. These findings suggest that IntelliVent®-ASV mode has the potential to reduce the burden on the healthcare staff, by reducing manual ventilator adjustments. The results of our study need to be validated in a larger study.

References
Tissue Perfusion Markers in Critically III – Any Gold Standards of Preload Responsiveness?

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Background: There are multiple tissue perfusion markers whose values are used as surrogates for targets for tissue perfusion meant to guide resuscitation in shock states for critically ill patients. However, until this date, we are in search of an elusive marker that is a gold standard to guide resuscitation goals. Objective: A head-to-head comparison of the commonly used tissue perfusion markers to volume boluses and analyze changes in values before and after a volume bolus of normal saline. Setting: A thirty-five bedded multidisciplinary ICU of a tertiary care unit Study module: Consecutive patients were analyzed for response to volume boluses by mapping changes in tissue perfusion values for a duration dated Jan 2017-Oct 2022. The data was collected with a focus on demographics, SOFA scores, and tissue perfusion markers (Lactate1, Central venous oxygen saturation 1[ScVo2], Base excess 1 (BE1), Arterial venous carbon dioxide gap [CO2 gap1]) before a volume bolus respectively and Lactate 2, ScVo2, BE2 and CO2 gap2 after receiving a volume bolus of 1000 mL normal saline. Patients with dyspnoea, Acute kidney injury/Chronic kidney disease, Congestive cardiac failure, Severe Left ventricular dysfunction, patients on pressors, and pulmonary edema at baseline were excluded from the study. Severity scoring was done with SOFA scores and length of stay (LOS) was documented as a separate variable. Death/discharges from ICU were considered as endpoints for follow up. Statistical analysis was done using SPSS version 25. Results: A total of 66 patients were included (n = 66, M: F = 42:24, Age = 46.4 ± 20 years [range = 20–91]). Baseline SOFA scores for the cohort were 8.8±2 (range = 6–12). Lactate 1, ScVo2, BE1 and CO2 gap 1 values were 7.3±4.8 (range = 2–22), 65.1 ± 6.2 (range = 52–82), –8.1 ± 4.9 (range = 2–19) and 7.1 ± 3.8 (range = 2–17) respectively. Lactate 2, ScVo2, BE2 and CO2 gap 2 values were 7.4 ± 4.8 (range = 2–22), 65.7 ± 6.3 (range = 54–79), –5.9 ± 3.7 (range = 1 – –15), 6.2 ± 3.1 (range = 2 – 15) respectively. LOS was 6.9 ± 4.9 days (range = 1–22). In hospital, mortality was 27 (n = 27, 40.9%). On statistical analysis in terms of Correlation with mortality from baseline values, a Chi-square test was used to delineate mortality correlation from baseline marker values for which the p-value was significant for lactate and insignificant for others. A T-value was done to assess
deviation after a volume bolus which revealed a maximum deviation for the CO2 gap following a volume bolus, however, this deviation was statistically insignificant. Conclusion: Volume responsiveness to a fluid bolus has remained an enigmatic and inexact science at the best and the search for a marker that accurately predicts the same has confounders and probably it would need bigger studies to achieve statistical significance despite the observations that lactate holds its value as a mortality predicting marker with some more work required to delineate whether titration of CO2 gap would actually be a target of resuscitation endpoints. This communication explores the validity of the above and whether CO2 gaps can be included in fluid resuscitation strategy endpoints.

Incidence, Risk Factor, and Outcome of Delirium in Mixed Semi-closed Intensive Care Unit: A Study From Nepal

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DOI: 10.5005/jp-journals-10071-24411.80

Objectives: Delirium is an underdiagnosed condition in the intensive care unit. This study was conducted to determine the incidence, risk factors, and outcome of delirium in a mixed semi-closed intensive care unit. Material and methods: This prospective study was done in 284 patients of age ≥18 years admitted for more than 24 hours in a level three intensive care unit of tertiary care hospital for one year. The whole sampling method was used in our study. The Confusion Assessment Method ICU and Richmond Agitation Sedation Scale were used to diagnose and motor subtype delirium, respectively, along with a checklist to assess risk factors. All data was transferred to the excel sheet and transferred to a statistical package for the social sciences-16. Chi-square test and Fisher’s exact probability test were used to detect the difference between groups in the univariate analysis, as appropriate. The risk factors were analyzed using binary logistic regression. Results: Out of the 284 ICU admissions 109 (38.4%) developed delirium. Mixed delirium was the most common motor subtype 39 (35.7%). The mean duration of delirium was 3.69 ± 4.06 days. High APACHE II, SOFA score, presence of co-morbidities, history of alcohol intake, hypoxemia, metabolic acidosis, and mechanical ventilation were identified as risk factors for delirium. Delirious patients had a longer length of stay in the ICU (5.8 ± 5.4 vs 4.2 ± 4.3 days) and reintubation with no impact on the duration of mechanical ventilation, mortality, and unplanned extubation. Conclusions: Early identification of risk factors and preventive measures should be taken to decrease the incidence and complications of delirium. Keywords: Delirium, incidence, intensive care units, mortality, risk factors.

New Drug Therapies for Acute Kidney Injury

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DOI: 10.5005/jp-journals-10071-24411.81

Acute Kidney Injury (AKI) impacts approximately 13.3 million patients per year worldwide and is associated with high morbidity, healthcare costs, and mortality—approximately 1.7 million deaths per year globally. Moreover, among survivors, long-term outcomes of AKI can include the development of chronic kidney disease (CKD) and end-stage renal disease (ESRD) or acceleration of pre-existing CKD to ESRD. Message: Acute Kidney Injury represents a major burden for both the patient and society, but a dedicated treatment is lacking so far, likely related to its multifactorial nature and our current inability to identify AKI-phenotypes. Nevertheless, with the recent advances in the understanding of its pathogenesis and progress in trial design, a spectrum of targeted therapeutics interventions is emerging that have potential to impact the prognosis of patients with AKI. Acute kidney injury (AKI) is common in critically ill patients and is associated with serious short and long-term complications, including chronic dialysis dependence, and increased mortality. There is no approved pharmacological therapy to prevent, treat or enhance recovery from AKI. Current strategies focus predominantly on preventing further deterioration of renal function. Challenges in determining the exact timing, etiology, and phase of AKI may account for the limited progress in this field. The use of additional biomarkers to define AKI may provide granularity enabling earlier detection. Nevertheless, research addressing the pathophysiology of AKI has identified potential therapeutic targets, including pathways involved in hemodynamics and oxygen delivery, inflammation, cellular metabolism and oxidative stress, apoptosis, and cellular repair and fibrosis. In the future, the identification of different AKI sub-phenotypes, informed by emerging time-sensitive and AKI phase-specific biomarkers may aid accelerated and successful drug development in this critical area of unmet need. Here, we describe selected compounds that impact known pathophysiological processes and have been studied in human.

A Comparison of Ventilatory and Cardiopulmonary Variables in Patients Undergoing Pressure Control Ventilation and Airway Pressure Release Ventilation in Intensive Care Unit

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Introduction: Mechanical ventilation is a life support intervention routinely applied when respiratory system is ineffective to meet the respiratory and metabolic demands of the patient. Mechanical ventilators are equipped with various conventional and newer mechanical ventilation modes and have been practiced to achieve optimum oxygenation and normocapnia. However, these modes are associated with its inherent advantages and disadvantages. Objective: Airway Pressure Release Ventilation (APRV) is an advanced mode of ventilation introduced to facilitate constant recruitment of alveoli and subsequently improves cardiac function and oxygen delivery. The objective of the study is to evaluate and compare ventilatory and cardiopulmonary variables in ICU patients on airway pressure release ventilation (APRV) with conventional pressure-controlled ventilation (PCV). Materials and methods: In this randomized prospective double-blind crossover study, 90 adult patients with stable hemodynamics, requiring invasive mechanical ventilation and admitted to ICU, were randomly allocated to either Group I or II, with 45 in each group. After keeping the patients on initial synchronized intermittent mandatory ventilation (SIMV-VC) mode and recording baseline ventilatory (airway pressures, resistance, compliance) hemodynamic and arterial blood gas (ABG) parameters, patients were switched to either PCV (Group I) or APRV (Group II) mode for 60 minutes. Thereafter, patients were again switched to SIMV-VC mode for 60 minutes as a washout period and eventually switched to APRV (Group I) and PCV (Group II) for the next 60 minutes. All aforesaid parameters were recorded at the end of 60 minutes on each mode and were compared. Results: The difference in the average of peak (Paw), plateau (Pplat), mean arterial pressures (Pmean), mean static compliance (Cst), and mean end-tidal carbon dioxide (EtCO2) was significantly higher on APRV mode of ventilation in both groups (p < 0.05). Discussion: Airway
A Retrospective Cross Sectional Study to Analyze the Outcomes of In-hospital Cardiac Arrest Patients in a Tertiary Care Hospital

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Introduction:
In-Hospital Cardiac arrest (IHCA) encompass an area that are frequently encountered, with a better survival rate as compared to out of hospital cardiac arrest (OHCA). Nonetheless, they are associated with higher poor neurological outcomes. According to the ACLS guidelines which classifies the causes of cardiac arrest as SH/ST, unlike broadly, the most common etiology of OHCA is acute coronary syndrome (cardiac cause), while the cause of IHCA is varied. The survival rate and neurological outcome of IHCA in Lower middle income countries (LMIC) remains under studied. Healthcare professionals in LMICs practicing in resource limited settings have lower awareness and skills about ACLS as compared to their Western counterparts. This study was undertaken to study the incidence of IHCA their outcomes in a tertiary level hospital. Objectives: To study the incidence and neurological outcome of patients with IHCA admitted to our hospital. The primary outcome was the survival at the time of discharge. The secondary outcome evaluated the percentage of patients who achieved return of spontaneous circulation (ROSC) and the neurological outcome at the time of discharge.

Methodology: Study Design: Cross-sectional retrospective analysis. Study period: Duration of two years. Inclusion criteria: Adult patients were admitted to our hospital and were being managed in out-of-intensive care units. Exclusion criteria: Patients who had a ‘Do Not Resuscitate’ Status and those admitted to the intensive care unit were excluded. Data Collection: The data was obtained from the code blue forms that were filled at the time of cardiac arrest in patients. The medical records were accessed to complete the missing data. Institutional ethics committee approval was taken and a consent waiver was given. Statistics: Data were analyzed using descriptive statistics. Results: The total number of cardiac arrests with completed code blue forms was filled for 101 patients. The average age and gender were 53 years and males respectively, at the time of the arrest. The incidence of ROSC in the IHCA was found to be 60%. The most common rhythm that was recorded in the patients who achieved ROSC was pulseless electrical activity (PEA) (60%) followed by asystole in 16% of patients. The non-shockable rhythm was more commonly recorded (86%) in patients with ROSC. The etiology most commonly associated with cardiac arrest in our study was hypoxia (59%). Almost 70% of the patients did not suffer from acute kidney injury after ROSC in IHCA. The survival rate of IHCA in our study was 18% with shockable rhythm having a better survival rate as compared to non-shockable rhythm and around 53% of the total survivors had a favorable neurological outcome at the time of discharge (Glasgow Coma Score > 12). A high percentage of 43% (44) of the total patients withdrew medical care due to the futility of medical care or inability to bear medical expenditure. Conclusion: In this study, although an incidence of 18% IHCA was associated with a good neurological outcome in half the patients who achieved ROSC, the burden on healthcare remains high. Mandatory ACLS training of healthcare personnel can help to reduce IHCA and hence burden on healthcare. Grant acknowledgement – none

References

Dengue Encephalitis
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Dengue infection is the most important tropical viral disease in the world today. According to the World Health Organization, 50 million symptomatic dengue infections occur annually representing a huge public health problem mainly in Southeast Asia and Western Pacific regions. Dengue virus (DENV) are single-stranded RNA arboviruses with four serological types (DENV 1–4) and belong to the Flaviviridae family. Dengue is classically considered a non-neurotropic virus. The clinical spectrum of dengue fever ranges from asymptomatic infection to dengue shock syndrome. Clinical symptoms of dengue infection vary, ranging from simple myalgia, arthralgia, headache, dengue fever (DF), dengue hemorrhagic fever (DHF), dengue shock syndrome (DSS). Dengue infection with acute encephalopathy was first reported by Sandagansers et al., in 1976 since that time, there have been reports from several Southeast Asian countries. Neurological complications are not commonly seen in dengue. Dengue encephalitis is a rare disease. Neurological dengue manifesting as encephalopathy, encephalitis, encephalomyelitis, myelitis, brachial neuritis, Guillain Barre syndrome, hypokalemic paralysis, viral myositis and rare oposconulus-myoclonus syndrome. Although basic pathophysiology of central nervous system involvement in dengue infection remains unclear, the encephalopathy in the reported cases have been attributed to cerebral edema, anoxia, hemorrhage, hyponatremia, hepatic failure, and release of toxic substances. Various animal and clinical studies have suggested a neurotropic potential of DENV leading to encephalitis. Detection of virus antigen in brain autopsy samples, dengue-specific immunoglobulin M antibody (IgM Ab) and positive reverse transcriptase PCR (RT-PCR) in cerebrospinal fluid (CSF) support the hypothesis of neuro-invasion during acute dengue infection.
A Prospective Observational Comparative Study Between CPIS vs CEPPIS For Predicting Early Diagnosis of Ventilator-Associated Pneumonia In Critical Care Patients
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DOI: 10.5005/jp-journals-10071-24411.84

Objective:
Primary:
• To identify a correlation between CPIS & CEPPIS in patients with ventilator-associated pneumonia.

Secondary:
• To identify a correlation between CPIS & CEPPIS (Day 1) and 28-day mortality in patients with ventilator-associated pneumonia.
• To identify CPIS & CEPPIS (Day 1) and the required duration of mechanical ventilation in patients with ventilator-associated pneumonia.
• To estimate the efficacy of LUSS and Lung compliance in the detection of VAP.

Introduction: Ventilator-associated pneumonia (VAP) is a common and serious problem in the intensive care unit that is associated with an increased risk of death. Accurate diagnosis is important so that appropriate treatment can be instituted early while simultaneously avoiding antibiotic overuse and consequently, antibiotic resistance. The traditional diagnostic criteria are clinical, radiological & microbiological. The current study was designed to evaluate the diagnostic yield of sequential estimation of CPIS score, CEPPIS score, lungs USG, lungs compliance, P/F index for diagnosis of VAP, and predictability for the survival of patients admitted to medical CCU.

Methodology: This prospective observational comparative study was performed on 75 patients on invasive mechanical ventilation admitted in CCU in the Department of Critical Care Medicine IPGME&R and SSKM Hospital Kolkata. The diagnosis of VAP was established according to the standard criteria: clinical pulmonary infection score ≥6 &/or CEPPIS score ≥5, ABG variables and lung compliance. Baseline demographics, co-morbidities, medical history, cause for ICU admission, and APACHE-II score, were recorded in all included patients. Daily CPIS, LUS score, P/F ratio, and lung compliance were calculated for the initial 5 days after inclusion in the study. Other recorded data included 28-day mortality, length of stay in ICU, mechanical ventilation days, ICU-free days, and length of stay in the hospital. Result: In this study of 75 patients, 38 patients were male (51%) and 37 patients were female (49%). The distribution of VAP was 62 out of 75 patients selected (82.7%). There were no significant differences associated with baseline vitalis, body built, APACHE 2 Score, and SOFA score between VAP/no VAP group. Out of 62 patients with confirmed VAP, 35 were suspected positive earlier by using the CEPPIS score (56%), 21 were earlier by using the CPIS score (34%), and 6 patients were suspected on the same day with both CPIS and CEPPIS scores. The CEPPIS AUC yield was higher. Among all CEPPIS was most Sensitive (66.13%), followed by CPIS (62.9%), LUS (61.29%), and P/F (46.77%). PPV of CEPPIS & CPIS was 100%, followed by LUS (95%), P/F (82.86%), and LC (82.67%). NPV (%) of CEPPIS (38.24) was best followed by CPIS (36.11), LUS (31.43), L/C (20.63), P/F (17.50), L/S, and P/F in our study was not statistically significant. In this study, CEPPIS (p < 0.001), LUS (p <0.003), and CPIS (p < 0.001) was statistically significant in predicting VAP. Conclusion: The results show that the CEPPIS seems to be a better predictor of VAP, Hospital length of stay, mortality, and duration of mechanical ventilation compared to CPIS.

Routine use of Lung ultrasound appears to be better than Chest x-ray in the imbalance-cost-feasibility-benefit method.

Lung and Cardiac Ultrasound for Fluid Management in Acute Kidney Injury Patients In ICU: A Prospective Randomized Controlled Study
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Objectives: Primary objective is to compare the 28 day all cause mortality rates in control and study groups. Secondary objectives are to compare the fluid balance, p-ratios, diuretics, length of ICU stay. Materials and methods: The study was carried out in the ICU of a tertiary care hospital. After the approval from the Institutional Ethical committee, written and informed consent was obtained from all the patients before being included in the study. 130 patients were admitted in ICU during the study period, 30 patients were excluded and 100 patients were included in the study 50 patients in each group. Acute kidney injury patients admitted in the ICU during the study period were randomly allocated to two groups, Control group and study group. In control group patients get conventional standard of care with fluid, diuretics, RRT and vasopressors/ inotropes administration according to clinical judgment. In study group patients get standard care along with lung and cardiac ultrasound guided fluid, diuretics, RRT and vasopressor/inotrope administration. In lung ultrasound B line score was calculated and graded as mild, moderate and severe every day since the admission in ICU or diagnosis of AKI. Diuretics or RRT were administered in moderate and severe cases depending on the patient’s condition. In cardiac ultrasound IVC diameter, IVC collapsibility index, IVC distensibility index, and eyeballing of cardiac chambers were done. Fluid status assessment is done using the ultrasonographic parameters and fluid or vasopressors/ inotropes are administered accordingly. Results: About 22 out of 50 (44%) patients survived in the study group, and 15 out of 50 (30%) patients survived in the control group. The difference in mortality in the study and control group was statistically not significant (p = 0.147). There was a significant difference in fluid intake between the control group (Mean fluid intake of 2038 mL) and the study group (mean fluid intake of 1782 mL) (p = 0.02), with positive fluid balance in the control group, mean of 1448 mL and in study group mean 1046 mL (p = 0.006). There was a significant decrease in respiratory support (p = 0.005), and a significant improvement in P/F ratios (p = 0.01). Conclusion: The use of lung and cardiac ultrasound for fluid management in AKI in ICU patients shows improved outcomes in terms of mortality, fluid balance, and P/F ratios.

A Prospective Analysis of Significance of Collections Around Colon in Patients with Acute Necrotizing Pancreatitis
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Diagnosis of Acute Dyspnea

peri-colon collections correlate with the clinical outcomes including survival. A need for surgery was seen in 15.4% of patients. The median duration of ICU stay was 30.2 days where the colon (\(<180^\circ\) = 20 and \(>180^\circ\) = 17 patients). Among patients without peri-colon collection, the average first abdominal drain was required on 14.48 ± 1.89 days of pancreatitis. The median day of the first drain placement was 10 days. In these patients, all maiden cultures were sterile, which were collected around the 12th day of pancreatitis. None of the patients required surgery. The median duration of ICU stay was 26.6 days and survival at ICU discharge was 75%. Among patients who had peri-colon collection, the first drain was placed around 8.86 days and they mostly grew E. coli (55%) and Klebsiella (38%) in their culture reports. The median length of ICU stay was 30.2 days where the colon was <1800 involved with survival at IC discharge of 56.8%. One-fifth (20%) of patients underwent necrosectomy; while 10% required surgery for GI perforation. Whereas the rate of complications was higher in patients with colon involvement >180°. The median length of ICU stay was 29.23 and 70% grew Klebsiella spp. and all patients were required to drain with a median day of 11.2 days. One-third (35%) of patients had to undergo necrosectomy and in 11.7% of patients, there was a need of surgery. Survival at ICU discharge was only 34.8%. Conclusion: In critically ill patients with acute necrotizing pancreatitis, peri-colon collections correlate with the clinical outcomes including intra-abdominal infection, the need for surgery and survival at ICU discharge.

Third Eye of an Intensivist: The Use of Ultrasound in Differential Diagnosis of Acute Dyspnea

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A Comparison of Ventilatory and Cardiopulmonary Variables in Surgical Patients Undergoing Synchronized Intermittent Mandatory Ventilation-volume Control and Pressure-regulated Volume Control in Intensive Care Unit

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Objectives: The objectives of my review are the evaluation of the differential diagnosis of dyspnea, the prevalence of dyspnea and the causes of it. The evaluation of the Ultrasound effectiveness compared to CXR and CT SCAN and also its diagnostic performance in case of detecting the causes of the dyspnea. Materials and methods: The physiological and diagnostic, as well as some Ultrasound basis information is taken from different major scientific databases. Epidemiological and also Ultrasound information are performed from a quantity of 7 studies. Results: Although a minor amount of studies described the differential diagnosis of dyspnea, the studies demonstrated an increase in sensitivity and specificity while using Ultrasound for the diagnosis. The ultrasound took less time to perform the diagnosis, so a faster treatment could be provided. Cardiac causes of dyspnea were the highest in our result. Conclusion: Cardiac and pulmonary diseases were the major causes of acute dyspnea causes. Ultrasound could replace the radiological diagnosis of the causes of dyspnea, either by its efficacy or its faster diagnosis. So ultrasound plays a Third Eye in diagnosis of acute critical illness.

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Research aim: The main aim of my study is to evaluate the efficacy of Ultrasound in the differential diagnosis of dyspnea. This review analyses the results of previously performed studies evaluating the difference between Ultrasound and CXR (Chest X-ray) and their sensitivity and specificity. Objectives: The objectives of my review are the evaluation of the differential diagnosis of dyspnea, the prevalence of dyspnea and the causes of it. The evaluation of the Ultrasound effectiveness compared to CXR and CT SCAN and also its diagnostic performance in case of detecting the causes of the dyspnea. Materials and methods: The physiological and diagnostic, as well as some Ultrasound basis information is taken from different major scientific databases. Epidemiological and also Ultrasound information are performed from a quantity of 7 studies. Results: Although a minor amount of studies described the differential diagnosis of dyspnea, the studies demonstrated an increase in sensitivity and specificity while using Ultrasound for the diagnosis. The ultrasound took less time to perform the diagnosis, so a faster treatment could be provided. Cardiac causes of dyspnea were the highest in our result. Conclusion: Cardiac and pulmonary diseases were the major causes of acute dyspnea causes. Ultrasound could replace the radiological diagnosis of the causes of dyspnea, either by its efficacy or its faster diagnosis. So ultrasound plays a Third Eye in diagnosis of acute critical illness.

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Objective: Pressure-regulated volume control (PRVC) is a dual mode of mechanical ventilation that integrate volume and pressure-control ventilation. This mode delivers lower maximum inspiratory pressure, flow coordination of ventilation pattern, less manipulation of the device by the operator, and automatic decrease of ventilator support. The objective of the study is to compare the ventilatory and cardiopulmonary variables in mechanically ventilated surgical ICU patients on conventional SIMV-VC with PRVC mode of ventilation. Materials and methods: This is an interventiontive, prospective, randomized controlled, double-blinded study trial, where 106 adult post-exploratory patients requiring invasive ventilation were randomly allocated into two groups with 53 in each. After recording baseline ventilatory (peak airway pressure, mean airway pressure, compliance, static compliance, airway resistance), hemodynamic (pulse rate, systolic blood pressure, diastolic blood pressure, mean arterial pressure, peripheral oxygen saturation, end-tidal carbon dioxide), and arterial blood gas (pH, PaO2, PaCO2) parameters on initial assist control volume control (AC VC) mode of ventilation, patients were randomly allocated to either Group 1 (SIMV VC) or Group 2 (PRVC) mode of ventilation with preset ventilatory settings. Subsequent ventilatory and cardiopulmonary parameters were recorded at 2, 4, and 12 hours respectively. Results: Patients receiving the PRVC mode of ventilation showed a significant reduction in peak pressures and airway resistance at all time points (p < 0.05). Total compliance was significantly improved 12 hours after...
receiving the PRVC mode of ventilation ($p < 0.05$). Hemodynamic and arterial blood gas variables were comparable between the two groups ($p > 0.05$). **Conclusion:** Post-exploratory laparotomy patients with acute respiratory failure, requiring ventilatory support showed appreciable improvement in ventilatory profile after receiving the PRVC mode of ventilation. However, comparable hemodynamic and arterial blood gas parameters between the advanced PRVC mode and with conventional SIMV VC mode of ventilation, necessitate long-term evaluation and further studies.

**A Prospective Study to Compare Biofire Film Array and Standard of Care: Clinical Response, Empirical Antibiotic Days and Costs Involved**

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**Objectives:**
- To see the patient’s clinical response (to change in treatment with Fire array reports) by seeing: Primarily impact on organ dysfunction
- change in composite organ failure score (SOFA score) at the end of 1 week, total ICU days, mortality – at day 7 and day 30
- To study the decrease in the empirical antibiotic days and associated costs

**Materials and methods:** After institutional ethics committee approval and registration with CTRI, this prospective study was conducted in the Department of Critical Care Medicine, Indira Gandhi Institute of Medical Sciences, Patna starting in October 2022 with a proposed sample size of 90 patients. All adult (≥18 years and ≤65 years) ICU patients with suspected BSI or LRTI who are started on empirical antibiotics were considered for inclusion. Exclusion criteria were: Age <18 years and >65 years, patients with UTI, meningitis, and septic foci other than BSI and LRTI. (excluded based on history, examination, and routine investigations). Patients with comparable SOFA scores at admission and demographics were divided into two groups—cases and controls. (based on informed consent). Cases underwent fire array testing whereas controls underwent SOC testing. The intervention was a change of antibiotics in cases based on results obtained by the BioFire film array. To see clinical response – change in SOFA scores on day 7 was calculated and data were presented as mean. Total days of ICU stay and mortality at days 7 and 30 were calculated and data were presented as mean. The decrease in the empirical antibiotic days was calculated. The expected decrease in the empirical antibiotic cost and cost saved by the decrease in ICU stay was compared with the cost of doing the BioFire film array. **Results:** Based on an interim analysis of 13 patients (the study is currently underway).

**Epidemiology of Dysnatremia in a Medical Intensive Care Unit of a Tertiary Care Hospital**

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**Introduction:** Dysnatremias are common findings in patients admitted to the intensive care unit and can adversely affect various physiological functions and organ systems. Dysnatremia is associated with various negative consequences such as decreased brain function, compromised cardiac contractility, increased insulin resistance, abnormalities in neuromuscular function, creation of an inflammatory milieu, and aggravation of interstitial edema. **Objectives:** To study the incidence of dysnatremia in a medical intensive care unit of a tertiary care hospital and its effect on the duration of mechanical ventilation, length of ICU stay, and outcome of ICU stay. **Materials and methods:** This was a Prospective observational study conducted on patients admitted to a MICU of a tertiary care hospital over a period of 4 months. Patients with Pseudohyponatremia like Hyperlipidaemias, Paraproteinemias, Hyperglycaemia and Patients who were admitted for less than 24 hours and also repeat ICU admissions during the current hospital stay were excluded from the study. The sodium value of all the patients was taken from the day of admission till the endpoint of the outcome. The volume status of the patient was assessed and classified as hypervolemic, euvoelemic, and hypovolemic. Sodium values were checked as a routine in ICU for all the patients. In dysnatremic patients, more frequent evaluation was done and the worst value of sodium was taken. The assessment of the etiology of dysnatremia was done for severe disorders. The need for ventilation, duration of ventilation, length of ICU stay, and outcome of ICU stay were noted. APACHE and SOFA scores on admission were also documented. **Results:** Chi-square test was used for testing the statistical significance of mortality and the student t-test for mechanical ventilation. A total of 230 patients out of the 253 screened were included in the study. Out of these 230 patients on admission, 127 were having normal sodium levels, 99 were hyponatremic, and 4 were hypernatremic. However on their continued ICU stay, 99 patients showed eunatremic, 119 hyponatremic, 10 hypernatremic, and 2 mixed values. The average stay in ICU was 6 days ranging from 2 to 38 days. About 46 patients were mechanically ventilated of which 16 patients died. Among 16 deaths 3 were eunatremic and 13 were dysnatremic. out of 230 admitted to ICU 198 got discharged, 9 were discharged against medical advice and 23 died. Among 23 deaths 6 were eunatremic, 12 hyponatremic, 4 hypernatremic, and 1 had mixed values. **Discussion:** In the present study, Hyponatremia was found in 51.73% of patients which was slightly higher compared to other studies. In the present study, Hypernatremia was found in 4.34% which was similar to other studies. The ICU stay in our study was significantly high in Dysnatremic

**CASES - 7** | **CONTROLS - 6** | **p-value**
---|---|---
Mean SOFA at admission | 8.4 | 9.1 | >0.05
Mean SOFA at D7 | 4.5 | 8 | 
Mean change in SOFA | 3.28 decrease | 1.1 decrease | <0.05
Mean ICU days | 10.7 | 14.8 | 
Mortality | 1 | 2 | 
Empiric antibiotic days | 4 days; 3 doses | 28 days | 
Empiric antibiotic cost | 17,100 | 62,000 |
patients similar to other reported studies. This may be due to more comorbidities as well as the old age of these patients. The mortality rate in our study among dysnatremic patients was significantly lower (10%) compared to other studies. This may be due to good quality care by experienced intensivists and an aggressive approach.

References

Femoral Vein Access for Central Venous Catheterization as Rescue for Failed Peripheral Access for Blood Sampling, IV Nutrition and Drug Delivery
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Objective: To study the role of femoral venous access as a rescue for failed peripheral access in patients requiring long-term intravenous nutrition and drug therapy, and in critically ill patients.

Materials and methods: Our study comprises 25 patients, 17 male, and 8 female patients were catheterized via femoral vein after failed peripheral venous access, either due to refusal of consent for subclavian or internal jugular catheterization, unsuccessful access to internal jugular and subclavian veins, or extreme patient sickness. There are 11 patients were administered prolonged intravenous antibiotics and antifungals for pyelonephritis, 5 patients were cannulated for the management of severe shock in which peripheral access was difficult, and 9 critically ill patients were administered long term medication and parenteral nutrition via the femoral route.

Results: In our study, we found that 3 patients developed blood ooze from the puncture site, 2 had difficult access because of a pre-existing partial thrombus in the vein and 2 patients developed a hematoma at the puncture site. Later, 3 patients developed an infection at the catheter site, 3 patients had delayed onset bleeding from the puncture site, 2 patients had device dysfunction due to poor blood flow and 1 patient developed deep vein thrombosis. The rest of the patients did not develop any catheter-related complications.

Conclusion: Central venous access plays a crucial role in the management of critically ill patients, as well as in patients requiring long-term drug therapy or in patients in which peripheral intravenous access has failed. The three common sites for this access are the internal jugular vein, the femoral vein, and the subclavian vein. Ultrasound-guided femoral vein puncture makes the procedure safer and faster, reducing the complication rates. Femoral vein catheterization can be considered a rescue procedure in cases where peripheral intravenous access has failed, and in patients requiring long-term drug therapy and parenteral nutrition.

A Prospective Observational Study to Determine the Variation of E/E’ (Peak Early Diastolic Transmitral Velocity/Peak Early Diastolic Mitral Annular Plane Velocity) in Patients with Septic Shock and its Role in Predicting In-hospital Outcome
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Introduction: Sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection. Septic shock is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality. (1) Despite the fact that this clinical illness is heterogeneous in terms of the causative microorganism, patient propensity, co-morbidities, and therapeutic response, the expression of cardiovascular dysfunction is a crucial component and a defining trait. (2) Even though systolic dysfunction has been pinpointed as
the main offender, it is unclear how diastolic dysfunction or left ventricular filling affect cardiovascular morbidity and mortality in septic shock. The ratio of early mitral inflow velocity (measured using pulse wave doppler-E) to early diastolic velocity in the mitral annulus (measured using tissue doppler imaging- e’)- E/e’, which has become essential to the criteria for diastolic evaluation, is the technique most frequently employed for this purpose (FIG 1, 2 and 3).

**Objective:** Measuring tissue doppler imaging variables E/e’ of the patients within 24 hours after developing septic shock and then for two consecutive days and comparing the trend of the values between survivors and nonsurvivors. **Methods:** We included 50 patients in septic shock whose age is more than 18 years and excluded patients who have valvular heart disease (moderate to severe) and also excluded those who had a diagnosis of
- Acute myocardial infarction or recent myocardial infarction (within the last 6 weeks)
- Atrial fibrillation
- Cardiogenic shock
- Recent cardiac surgery
- Diagnosed congenital heart disease
- Significant mitral regurgitation, severe mitral stenosis, history of MVR

After enrolment baseline characteristics and on admission APACHE score was recorded. All patients were treated according to standard protocol. E/e’ was calculated within 24 hours of the development of shock (day 1) and then at 24-hour intervals two more times (day 2 and day 3). Using tissue doppler imaging e’ was calculated as an average of the septal and the lateral part of the mitral annulus. Following this, the study population was subdivided into two groups, i.e., survivors and nonsurvivors, and the trends of E/e’ were analyzed. **Results:** The means for each day were calculated in both the groups and the data was analyzed which showed that in the survivors group the ANOVA of repeated measures with the Greenhouse Gaiser sphericity test the p-value is 0.098 and F is 2.464 which was not statistically significant but there was a significant increase in the E/e’ between day 2 and day 3 (p = 0.041) but no difference in between day 1 and day 3 (p = 0.9). In the nonsurvivors group, the ANOVA of repeated measures showed an overall statistically significant difference in values of the means of E/e’ (p < 0.001) on the 3 days. The mean values of the E/e’ in the nonsurvivors group also increased each day and the difference was again statistically significant (day 1 to day 2 p = 0.004, day 1 to day 3 p < 0.001, day 2 to day 3 p < 0.001). **Conclusion:** In patients with septic shock without acute or recent myocardial infarction or associated cardiogenic shock or atrial fibrillation or any regional wall motion abnormality or any severe valvular or congenital defect or any recent cardiac surgery; E/e’ value is an independent predictor of mortality.

**Study of Clinical Profile and Outcome of COVID 19 Disease Treated With Remdesivir In a Tertiary Care Intensive Care Unit**

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**Introduction:** Coronaviruses (CoV) are a large family of viruses that cause illnesses ranging from the common cold to severe diseases such as middle east respiratory syndrome (MERS)-CoV and severe acute respiratory syndrome (SARS)-CoV 31 December 2019, China informed World Health Organization (WHO) about cases of Pneumonia of Unknown Aetiology detected in Wuhan city, Hubei Province of China. Out of these 44 cases reported, 11 were Severely Ill while the remaining were in stable condition. WHO on January 30, 2020, declared the COVID-19 outbreak as a Public Health Emergency of International Concern (PHEIC). The first laboratory-confirmed case of coronavirus was identified in India on 30 January 2020, in Kerala in a 20-year-old female returned from Wuhan, China. WHO declared the Pandemic on 11th March 2020. In Gujarat, the first two cases of the COVID-19 were confirmed on 19th
A study was conducted on a patient and 58 (29.9%) were severe disease. About 81.9% were males and 18.1% were female. Fever was the most common symptom overall (96.1%). Breathlessness on presentation was significantly higher in the severe group ($p < 0.05$). Diabetes Mellitus was the most common Comorbidity followed by hypertension. The day of illness on presentation significantly differed between the severe and non-severe groups ($p < 0.05$) (less than 7 days (40.7% vs 67.4%), >10 days (25.4% vs 9.7%). On admission, the average (median) of several laboratory parameters such as NL ratio, IL-6, Serum Ferritin levels, and Serum LDH among the cases studied is significantly higher in the group of cases with severe disease (14.50, 57, 568, 407) compared to the group of cases with mild/moderate disease severity (6.92, 39, 409, 347) ($p$-value $<0.05$ for all). Clinical recovery status at day 7, and day 10 among the cases studied is significantly lower in the group of cases with severe disease (10.2% and 37.3%) compared to the group of cases with mild/moderate (80.7% and 87.6%) disease severity ($p$-value 3.13) and serum ferritin (>500) are significantly higher in the group of nonsurvivor cases compared to the group of cases who survived ($p$-value $<0.05$ for all). Results: Early administration of Remdesivir within 7 days of onset of illness resulted in clinical recovery and mortality benefits in non-severe COVID-19 patients, with significant clinical recovery on the 7th and 10th day, improving overall outcomes in the nonsevere group than the severe group. Our Study demonstrated that patients requiring low-flow oxygen therapy on admission benefited significantly with Remdesivir in terms of clinical recovery and mortality without causing significant laboratory abnormalities, or infusion-related issues, and also co-administered with steroids in all patients. Grant acknowledgement: Early administration of Remdesivir within 7 days of onset of illness resulted in clinical recovery and mortality benefits in non-severe COVID-19 patients, significant clinical recovery, improves overall outcome in a nonsevere group than severe group, patients requiring low flow oxygen therapy on admission benefited significantly without causing significant laboratory abnormalities, Infusion-related issues and also co-administered with steroids in all patients.

Objectives:
- To study the clinical profile of COVID-19 disease treated with Remdesivir at a tertiary intensive care unit
- To study initial inflammatory markers and outcomes of patients treated with Remdesivir
- To study the outcome of Remdesivir on disease progression
- To study the requirement of mechanical ventilation/renal replacement therapy in COVID-19 disease patients treated with Remdesivir
- To study the overall outcome of COVID-19 disease treated with Remdesivir

Materials and methods: A study was conducted on a patient admitted to an Intensive Care Unit at an AHIL, Gandhinagar having Confirmed Covid 19 disease (COVID-19 RT PCR positive) of category B and C treated with Remdesivir. Discussion: Total of 204 patients were included. On Admission 145 (71.1%) were mild/moderate and 58 (29.9%) were a severe disease. About 81.9% were males and 18.1% were female. Fever was the most common symptom overall (96.1%). Diabetes Mellitus was the most common Comorbidity followed by hypertension. The day of illness on presentation significantly differed between the severe and non-severe groups ($p < 0.05$) (less than 7 days (40.7% vs 67.4%), >10 days (25.4% vs 9.7%). On admission, the average (median) of several laboratory parameters such as NL ratio, IL-6, Serum Ferritin levels, and Serum LDH among the cases studied is significantly higher in the group of cases with severe disease (14.50, 57, 568, 407) compared to the group of cases with mild/moderate disease severity (6.92, 39, 409, 347) ($p$-value $<0.05$ for all). Clinical recovery status at day 7, and day 10 among the cases studied is significantly lower in the group of cases with severe disease (10.2% and 37.3%) compared to the group of cases with mild/moderate (80.7% and 87.6%) disease severity ($p$-value 3.13) and serum ferritin (>500) are significantly higher in the group of nonsurvivor cases compared to the group of cases who survived ($p$-value $<0.05$ for all).

References
3. WHO corona virus dashboard (accessed on 26 dec 2021 at https://covid19.who.int/)
Serial Bedside Ultrasonography For Estimating Urinary Bladder Wall Thickness as a Predictor For Catheter Associated Urinary Tract Infection In Critically Ill Patients: A Reliable “Cut-Off ” Finding Study
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Introduction: Indwelling catheters are used routinely in the intensive care units (ICUs), usually for frequent and accurate monitoring of urinary output, which is indispensable for proper fluid balance in any critically ill patient. Approximately 15–25% of hospitalized patients and 98% of ICU pts use a urinary catheter during their stay and the majority of these patients are catheterized for 2–7 days. Timely and prompt diagnosis of CAUTI, though challenging for any intensivist, is the need of the hour. Now, we all have a portable USG machine in our ICU, accessible easily to us, which can be used bedside in real-time. USG has been used extensively by urologists and radiologists, on OPD and mobile patients, to calculate post-void retained urine volume, detrusor muscle thickness, and bladder wall thickness in patients with overactive bladder and BPH, also in cystitis, bladder stones, congenital deformities of bladder and tumors. But bedside USG has never been used in critically ill patients for evaluation of bladder wall thickness in screening and diagnosing CAUTI in the ICU. Objectives Reliability of serial bladder wall thickness (BWT) for screening and/or diagnosing CAUTI, with help of serial USG of the urinary bladder in the critically ill patient. Primary outcome: Performance of BWT in diagnosing CAUTI using receiver operating curve (AUCROC). Correlation of BWT (>5mm) with patient having catheter associated UTI. Secondary outcome: Prevalence of colonization and catheter associated UTI. Material and methods: Data will be collected for 200 patients who meet the inclusion and exclusion criteria. For the baseline BWT, we will take the help of an experienced resident who has done at least 20 USG of the urinary bladder. On the same day, the resident will put the PVC Foley catheter under strict aseptic and antiseptic precautions for 2 days following catheterization, a urine culture will be sent to look for colonization and we will also measure BWT in empty and distended (clamp the catheter and insufflate the bladder with 250 mL of normal saline) bladder. One symptom in form of fever is noted or any urinary sedimentation or dark coloration of urine is observed we will repeat the urine culture and also measure BWT in empty and distended (clamp the catheter and insufflate the bladder with 250 mL of normal saline) bladder. From here on the same step will be repeated until the patient is discharged/LAMA expires. Now we will compare the urine culture report and BWT. Results: There was a significant difference in bladder wall thickness in patients with UTI compared to those who did not have UTI. Conclusion: Ultrasonography can be a more useful tool for early diagnosis of UTI than urine cultures and sensitivity reports which take a longer time for diagnosis of UTI. Discussion: In our study, we conducted serial USG examinations of bladder wall thickness to diagnose UTI earlier than cultures which though the gold standard takes a longer time. We found that there is a significant change in bladder wall thickness from the initial thickness in UTI which helps to diagnose cases of UTI early.

References

A Study on Incidence Etiology and Outcome of Ventilator Associated Pneumonia in Tertiary Care Hospital
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Research aim: A study on incidence Etiology and outcome of ventilator-associated pneumonia (VAP) in tertiary care hospital. Objectives: • To study the incidence and crude mortality rate of VAP. • To evaluate and study the clinical profile of the patients having VAP. • To study the role of modified baseline CPIS in the diagnosis of VAP. • To study the relationship between the duration of MV and the time of onset of VAP. • To study the microbiological organism profile in early and late-onset VAP. Materials and methods: An observational study will be conducted on the patients admitted in the intensive care unit and ventilated for more than 48 hours at Apollo hospital Ahmedabad. Results and conclusion: • The method of intubation emergency or elective did not change the incidence of VAP. • The incidence of VAP increases with the duration of mechanical ventilation. • Aspiration is a major precipitating factor for developing VAP. • High incidence of MDR organisms in patients with VAP unlike in community-acquired pneumonia. • Diabetes is one of the major risk factors to develop VAP. • The duration of stay in ICU patients with VAP is very much pronged unlike in CAP. Conclusion: Ventilator associated pneumonia is a major burden on the health care system. It can be easily preventable by specific measures. That will reduce the overall cost of major critical illness treatment.
Respiratory Viral Co-infections in patients with COVID-19

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Abstract: COVID-19 has clinical similarities with other flu-like syndromes. Owing to the similarity of symptoms, there are chances of misdiagnosis of patients with other respiratory viruses such as COVID-19 or chances of missing out on viral co-infections in patients with COVID-19. Objectives: Here we report an etiologic pattern of respiratory tract infections, especially of the viral etiology, diagnosed at Yashoda Hospital, Hyderabad, a tertiary care hospital of Hyderabad, Southern India, during the period of the pandemic. Materials and methods: The patients presenting with respiratory symptoms were tested for the presence of other respiratory tract pathogens. At admission, we sent samples, nasopharyngeal swab for COVID real-time reverse transcriptase PCR (RT-PCR) and nasopharyngeal swab or Bronchoalveolar lavage (BAL), depending on the clinical profile, for multiplex PCR BioFire FilmArray Pneumonia panel or Respiratory panel (BioFire Diagnostics; bioMérieux, Marcy l’Etoile, France). These Biofire panels allow the detection of 33 respiratory pathogens with a run time of 1 hour. We retrospectively reviewed clinical and microbiologic records generated via routine clinical practice (ethical approval not required) from 490 consecutive patients (336 males; median age, 55 years; range, 14–93 years), with respiratory symptoms who were screened with FilmArray and RT-PCR for COVID-19, over 21 months from 1st June 2020 to 28th February 2022. Results: We included nasopharyngeal swabs (229/490, 46.9%), and BAL (261/490, 53.1%) samples. SARS-CoV-2 RNA was detected in 315 (64.8%) of 490 samples, while FilmArray showed the presence of other viruses in 54/490 (10.9%). FilmArray results showed 27/54 samples (50%) had multiple viruses, and were as follows: Rhinoviruses/Enteroviruses (24/54, 44.4%), Influenza A virus, Coronaviruses and rhinovirus (each 9/54, 16.6%). One nasopharyngeal swab in a 61-year-old COVID-19 patient showed the presence of rhinovirus/enterovirus and Influenza A and was mildly symptomatic, but no secondary cases were found among her contacts. Our data are consistent with results from other studies on co-infection, showing a low prevalence of other respiratory virus co-infection in SARS-CoV-2 patients, in the range of 1.6–6.5%. Several phenomena like viral interference, common receptor usage, different inoculum size, or simply resource competition might explain why dual or multiple concurrent viral respiratory infections are rare among COVID-19 patients.

Conclusions: A multiplex PCR system for rapid diagnosis of respiratory infections revealed that there is a low prevalence of concomitant viral infection in patients positive for SARS-CoV-2. Moreover, with the spread of SARS-CoV-2, the occurrence of other respiratory pathogens has undergone a sharp decline. Keywords: COVID-19, Respiratory viruses, Viral co-infection. Conflicts of interest: None.

References

Retrospective Analysis of New Onset AKI in a Medical Intensive Care Unit; Incidence, Risk Factors and Outcomes with 3 Months Follow Up

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Objective: The purpose of this study was to evaluate the incidence, underlying risk factors, clinical phenotypes, and prognosis of newly developed acute kidney injury (AKI) in critically ill patients in a multispeciality medical intensive care unit (ICU).

Materials and methods: In an 18 bedded multispeciality medical ICU, data was collected from March 2022 to August 2022 and then followed up for 3 months, between September 2022 to November 2022. “New onset AKI” was defined as AKI which developed within 72 hours of inpatient stay. Cases excluded were patients presenting to ICU with already elevated levels of creatinine or oliguria, those who were dialyzed before admission or who had already been diagnosed with chronic kidney disease (CKD). Acute kidney injury phenotypes were classified as transient within 48 hours or persistent beyond 48 hours. Incidence, risk factors, survival analysis, and major adverse kidney events (MAKE) were defined as death or new requirement of renal replacement therapy or 25% decrease in glomerular filtration rate (GFR) from baseline. Major adverse kidney events was assessed at discharge from hospital and 30 days, 60 days, 90 days follow-up respectively from the date of diagnosis of new onset AKI.

Results: A total of 498 patients; 34 patients (6.8%) developed new onset AKI. Median age 66.6 years (IQR 75.8, 60.3) with male predominance. The median APACHE II

Viral co-infection table

<table>
<thead>
<tr>
<th>Samples</th>
<th>Total number of samples</th>
<th>COVID-19 positive</th>
<th>COVID-19 negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronchoalveolar lavage (BAL)</td>
<td>261</td>
<td>150</td>
<td>111</td>
</tr>
<tr>
<td>Viral co-infection present</td>
<td>6 (4%)</td>
<td>21 (19%)</td>
<td></td>
</tr>
<tr>
<td>Viral co-infection absent</td>
<td>144</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Nasopharyngeal swab</td>
<td>229</td>
<td>164</td>
<td>65</td>
</tr>
<tr>
<td>Viral co-infection present</td>
<td>12 (7.2%)</td>
<td>15 (22%)</td>
<td></td>
</tr>
<tr>
<td>Viral co-infection absent</td>
<td>152</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>
score of patients was 15.5 (IQR 21.5, 14) and the SOFA score was 6 (IQR 7.75, 3). The majority of the patients had associated comorbid conditions, of which 64% (n = 16) had hypertension. About 82.4% of the patients (n = 28) were in stage 1 AKI. Patients with higher stages of AKI 2 and 3 (n = 6) had adverse outcomes (p = 0.026). Median ICU and hospital stay were 8.5 days (IQR 5, 14.3) and 11 days (IQR 8, 17.8) days respectively. The use of vasopressors was significantly associated with adverse outcomes (p = 0.006). Out of 34 patients, 21 (61.8%) patients had persistent AKI, among which 15 patients had MAKE (p = 0.001). Out of the 15 patients, 8 had MAKE at discharge in the form of death and 4 patients had MAKE at 30, 60, and 90 days in the form of AKD progressing to CKD. There are 5 patients who required renal replacement therapy of which only one recovered completely. There is a proportional correlation between SOFA scores and MAKE and MADE (p = 0.023). Median survival among our patients was 100 days (HR = 0.53).

Conclusion:
- We found there was a decreased incidence of new onset AKI compared to the study by Jiang, et al.
- Patients with persistent AKI had a higher risk of MAKE at discharge.

References

Incidence of VAP and 14 and 30 Days Mortality and Look for Synergistic Effect of Antibiotics When Statins Used along with Antibiotics: A Comparative Interventional Study

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Introduction: Definitive bacterial VAP is defined as a positive pleural fluid culture or rapid cavitation of the lung infiltrate as determined by computed tomography (CT), biopsy, or both, or an autopsy specimen showing histological evidence of pneumonia. As local and systemic inflammation play critical roles in pneumonia, statin-mediated attenuation of inflammation may improve pneumonia outcomes. Statins are lipid-lowering agents that are primarily utilized to reduce the risk of cardiovascular events by lowering cholesterol levels & statins also exhibit pleiotropic effects like immunomodulatory, anti-inflammatory, anti-thrombotic, and direct microbicidal action.

Aims and objectives:
- The primary objective of the study was to find out the incidence of VAP and 14-days and 30-days mortality.
- The secondary objective of the study was to look for the synergistic effect of statins with antibiotics and whether there is any escalation or de-escalation of the dosage of antibiotics required when statins are used along with antibiotics.

Material and methods: A prospective, double-blinded, clinical comparative interventional study was conducted from September 2020 to September 2021 in the ICUs of the Department of Anesthesiology, Trauma center, IMS-BHU, where all the patients were allotted into one of the 2 study groups based on whom statins and placebo were given.

Inclusion criteria: All critically ill adult neurotrauma patients, aged 18–60 years, were admitted to the ICU within 2 days of the incidence of trauma.

Exclusion criteria:
- Refusal by patients or patients’ relatives to give consent.
- Patients having contraindications to statins.
- Crush injury.
- Diabetes mellitus and CVA.

From our study, we concluded that using 20 mg of atorvastatin once daily with standard care of critically ill trauma patients not only decreased VAP incidence but also improved 14-days and 30-days mortality rate. LFT deranged patients or liver failure patients. Two groups were formed in the trauma ICU, IMS BHU Group I – placebo group. Group II – statin was given 20 mg od. The patients were divided into groups within two days of ICU admission, blinding was done for nursing staff who was administered the drug. To assess the severity of illness, ICU scoring system – APACHE II and SOFA scores were used for each patient admitted for more than 24 hours.

Results: Comparative analysis was performed using Chi-square and fisher exact test for categorical data. For continuous data, the student’s t-test and Wilcoxon rank sum test was used. The logistic Regression model was used to analyze risk factors. Two-tailed p-value < 0.05 were considered significant. Discussion: We observed that Atorvastatin in critically ill VAP patients does improve the outcome. There was a statistically significant reduction in the incidence of VAP in the Atorvastatin group as compared to the control group. The onset of fever & the onset of VAP was significantly delayed in the Atorvastatin group. The degree of fever (mean temperature) was also significantly lesser in the Atorvastatin group. Again, we observed that a significantly less number of patients landed up in sepsis in the Atorvastatin group as compared to the control group. As far as mortality is concerned there was a significantly less 14 days and 30 days mortality rate in the Atorvastatin group. Conclusion: From our study, we concluded that using 20 mg of atorvastatin once daily with standard care of critically ill trauma patients not only decreased VAP incidence but also improved the 14 days and 30 days mortality rate.

References

Clinical Audit on the Adequacy of Venous Thromboembolism Prophylaxis in the Intensive Care Unit, Teaching Hospital Karapitiya.

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Introduction: Venous thromboembolism (VTE) is included pulmonary embolism and deep vein thrombosis. It is a significant cause of mortality and morbidity in the critical care setting. Most of the patients admitted to the ICU have multiple risk factors for VTE, such as reduced mobility, major trauma, malignancy, advanced age, or recent surgical procedures. These patients are further predisposed to VTE by prolonged immobilization at ICU. Recent studies show a high prevalence of VTE among those who did not receive adequate thromboprophylaxis. Objective: Evaluate the adequacy of venous thromboembolism prophylaxis in the intensive care unit in teaching hospital Karapitiya, Sri Lanka, by applying validated VTE risk stratification tools. Method: All adult patients admitted to the medical ICU and stayed more than 24 hours and who were not already on anticoagulation treatment were included. Data was collected by referring to the bed head ticket and direct observation on documented VTE risk stratification and the methods of VTE prophylaxis prescribed and used within one month period in 2020. The adequacy of VTE prophylaxis was assessed by comparing the patient’s thromboprophylaxis with the recommendation given with the Padua prediction score. Result: Out of the selected 30 medical patients who met the inclusion criteria, 66.7% (20) are male, and 33.3% (10) are female. These patients were between 22 years and 64 years. 73.3% (22) are started on some form of thromboprophylaxis within 24 hours, while 26.7% (8) were not started on thromboprophylaxis within 24 hours of admission. In none of those patients, VTE risk stratification has not been documented in the bedhead ticket. However, an assessment of contraindications for the pharmacological thromboprophylaxis method and the bleeding risk was noted during the ward round. Out of the 22 patients who received any form of thromboprophylaxis, compression stockings are used in 91.7%, and Pneumatic compression is used in 8.3% of patients; pharmacological thromboprophylaxis is used only in 33.3%. As a pharmacological thromboprophylaxis agent, Heparin was used in 8.3%, and LMWH was used in 25%. About 36.4% had active bleeding or low platelet count <50*10², taken as a contraindication for pharmacological thromboprophylaxis. According to the Padua prediction score, 73.3% of patients have received adequate thromboprophylaxis. In 26.7% of patients, thromboprophylaxis was inadequate. No reported thromboembolic event occurred during the audit and was not screened for VTE either. The inadequacy of thromboprophylaxis was noted in high-risk patients as well as the moderate-risk group. Delay of starting VTE prophylaxis was encountered as inadequacy. Conclusion: Adaptation of internationally validated tools for risk assessment may be suitable for more objective evaluation. Protocol for bleeding risk assessment needs to be introduced to prevent inadequate VTE prophylaxis. Making the graduated compression stockings available at the time of ICU admission and educating the ward staff on the necessity of VTE prophylaxis among inward patients would minimize the delay in starting the prophylaxis.

Pneumoretroperitonium
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Introduction: Pneumoretroperitonium is the presence of retroperitoneal air. Diagnosis requires abdominal imaging -either abdominal radiography or computed tomography. CT is the “Gold standard”. The most common causes of pneumoretroperitonium are intestinal perforation due to diseases or complications due to endoscopic procedures, and gas bacterial infections. Case Record: Elderly female presented with abdominal pain of 1-month duration and jaundice of 1-week duration. She was admitted and evaluated and found to have Obstructive jaundice secondary to periampullary growth. Side viewing Endoscopy revealed ulceroproliferative growth between D1 and D2 suggesting malignant gastric outlet obstruction. ERCP was attempted and unsuccessful. Expandable metallic stent (SEMS) placement with cystosudenostomy was done endoscopically. She developed abdominal pain and distension and hence moved to ICU for management. Imaging post-procedure revealed pneumoperitoneum and pneumoretroperitonium. She underwent bedside peritoneal decompression. This case highlights post-procedure development of pneumoretroperitonium and conservative management considering the clinical status of the patient. Literature Review: Malignant gastric outlet obstruction causes significant morbidity, including nausea, intractable vomiting, dyselectrolytemia, and poor nutrition. Stent placement improves quality in these scenarios. Most often, pneumoretroperitonium appears as a complication of incidents during endoscopic procedures, when the perforation of the intestines can occur. There is no standard protocol for choosing the treatment for pneumoretroperitonium, the choice depends on the cause, general status of the patient, and clinical feasibility depending on the performance status of the patient.

An Unconscious Patient, Clinical Challenge: A Case Report
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DOI: 10.5005/jp-journals-10071-24411.101

Introduction: Neuroparalytic snake bite is one of the common causes of Medical emergencies in Rural India. Acute respiratory failure is the most dreaded complication, also other associated symptoms include Ptosis, Blurring of vision, abdominal pain, Slurred speech, Diplopia, difficulty in swallowing etc. To have an obvious history of bite (especially Common Krait bite) is not a usual scenario, as many times it goes unnoticed. Here we present a case treated in a Retrospective
manner on suspicion of a Neuroparalytic snake bite. **Objective:** To emphasize the importance of having a degree of suspicion for Neuroparalytic snake bites in rural parts of India, especially in the Rainy season. **Material and method:** We present a case of 28 years old male, brought by his father in an unconscious state at around 5:30 am in August, with a very short history of found being lying down bedside. On examination, patient was hemodynamically stable. Vitals were Pulse 90/min Regular, BP – 120/90 mm Hg; BSL – 131 mg/dl; Pupils - Mid dilated,RTL. SPO2: 84% on room air the patient was intubated in view of falling saturation and taken on artificial ventilatory support. The patient's CT brain was done which showed no obvious bleeding or Infarction. The patient admitted to ICU for further management. We started searching for any bite mark, which was absent. All routine Lab investigations and PTINR were done, which came to be normal. His WBCT was less than 20 minutes urine output was adequate. On Suspicion of Neuroparalytic snake bite, we started Anti-snake Venom (ASV), Atropine/Neostigmine Regimen, and injection of Calcium gluconate within 2 hours of admission. On day 2: The patient showed flickering movements of fingers and toes, which was improved to complete flickering movements of Hands and feet. Anti-snake Venom was continued. On 3rd Day, the patient started giving efforts to move his limbs and open his eyes. Further on day 4, the patient became conscious, obeying verbal commands and was Maintaining saturation on the T piece without additional oxygen support. On day 5, the patient was having spontaneous respiratory efforts, neck holding, and normal saturation on room air with the recovery of the complete power of all 4 limbs. So we extubated the patient. Further, when the patient became comfortable, on detailed inquiry, he narrated that, he went to micturate outside in bushes at around 1–1:30a.m. where he got some bite which was not much painful to bother him. He then neglected this and went to sleep again then he started having difficulty swallowing and breathing for some time and then probably fell unconscious. **Result:** The patient improved clinically and had an improvement in saturation. On day 5 of admission, had no signs of respiratory distress and normal power of all limbs, neck lift, and improvement in Ptosis, hence extubation was done. The patient was then discharged after completing 3 days of observation. **Discussion:** Venomous snake bite incidents are common in rural India, that too in the rainy season. Especially Neuroparalytic snake bites have complications such as Respiratory failure. Moreover, some Elapids (like Common Krait) sometimes have a painless bite, also leaving no prominent bite mark. In such cases, when no proper history is available, and no bite mark is present, a strong degree of suspicion may prove helpful to come to a diagnosis and it can be life-saving. **Keywords:** Neuroparalytic snake bite, respiratory failure.

**References**


**ECMO IN COVID-19 ARDS – Outcome and Experience in a Tertiary Care ICU**

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DOI: 10.5005/jp-journals-10071-24411.102

**Background:** COVID-19 is a systemic disease that predominantly affects the lung. Severe ARDS is seen in a considerable number of patients with COVID-19 which may not respond to conventional treatment. Extracorporeal membrane oxygenation (ECMO) has been used in such cases. **Methods:** We did a retrospective analysis of patients who underwent ECMO for severe ARDS. We analyzed clinical profiles, pre-ECMO features, ECMO characteristics, complications, factors influencing the outcome, and survival to hospital discharge. **Results:** A total of 19 patients underwent ECMO. The clinical profile was comparable in both survivors and nonsurvivors. 42.1% of patients had comorbidities and diabetes mellitus was the most common comorbidity seen. About 10 (52.63%) patients survived in the hospital and got discharged. Patients who survived got discharged had a trend towards longer duration on ECMO. Survivors had a mean duration of 25 days (7–50 days) compared to nonsurvivors who had a mean duration of 12 days (1–34 days) on ECMO. However, this was not statistically significant (p-value of 0.133). Survivors had a longer duration of ICU stay with 41.5 days (30–70 days) compared to 9 days (2–40 days) for nonsurvivors. This was noted to be statistically significant (p value of 0.001). **Discussion:** The outcomes in patients who received ECMO have shown varied results in many studies. A retrospective study involving 1035 patients from the ELSO registry has shown mortality of less than 40% In our study, 52.63% of patients survived until hospital discharge and 47.2% was the overall mortality. Another study showed survival of 54.5% and mortality of 45.5%. Our study noted that the mean duration of patients on ECMO was 17.82 days. In our study, patients who survived had an average duration of 25 days on ECMO as against 12 days in patients who did not survive. A study based on the ELSO registry showed an average duration of 13.9 days. A meta-analysis showed a mean duration of 15.1 days on ECMO. The mean duration of ECMO for non-COVID ARDS was 9.4 (±6.3) days in a retrospective study done in the Indian population which was lower compared to our study and the majority of other studies where ECMO was initiated for severe COVID-19 ARDS. In our study, we also noted that patients who survived until hospital discharge had a longer length of stay in the ICU compared to nonsurvivors which were statistically significant. **Conclusion:** ECMO is a promising modality for patients with refractory hypoxia for COVID-19. In our experience, patients who survived had a longer duration of ECMO (25 days) and also a longer length of ICU stay (41.5 days).

**References**

Glucose-insulin-potassium infusions have shown positive results with GIK usage in preventing post-op arrhythmias whereas few studies have shown no effect on arrhythmias and ICU length of stay. The use of GIK infusion is not associated with unfavorable effect of GIK infusion on non-cardiac complications, e.g., renal, pulmonary, and neurologic complications. Conclusions: Glucose-insulin-potassium (GIK) infusion is useful in preventing post-op arrhythmias after cardiac surgery and is associated with favorable postoperative outcomes in terms of less ionotropic support and lesser ventilation hours, thereby decreasing the ICU length of stay. The use of GIK infusion is not associated with significant noncardiac complications. Hence, we recommend the usage of GIK infusion for inappropriate post-cardiac surgery patients in the ICU to prevent and reduce arrhythmias, thereby decreasing the ICU length of stay.

References

Steroids in Moderate and Severe COVID-19 Acute Respiratory Distress Syndrome Intensive Care Unit Patients: A Single Centred Retrospective Observational Study

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Introduction: The relatively high infectivity and rapid progression of lung involvement of COVID-19 infection made corticosteroids potential drugs to counteract the hyper-inflammatory response in the lung reducing rate of progression to acute respiratory distress syndrome (ARDS). The predominantly used steroids were Dexamethasone (DEXA) and Methylprednisolone (MPS). Objective: This retrospective analysis aimed to compare the mortality of moderate and severe COVID-19 ARDS patients admitted to ICU and treated with either DEXA or MPS. Material and methods. Out of 204 patients, from March 2020 to March 2021, admitted to our ICU, the non-ventilated group had 75 and 34 whereas the ventilated group had 52 and 33 COVID-19 patients who were treated with DEXA and MPS respectively. Their data on demographics, comorbidities, and severity index at admission (APACHE II, CTSI, CORAD, Partial pressure of oxygen by fractional percent of inspired oxygen-P/F ratio), ventilation parameters, treatment given and outcome in terms of mortality was collected. Results: In mechanically ventilated patients, there was also no significant difference in demographics, severity index (P/F<100 50% vs 69.4%, NS), and comorbidities. In the MPS group, the duration of treatment was significantly less by 48.2% when compared to the DEXA group. These patients were treated with a higher dose of MPS 15 mg vs 9 mg (p = 0.001) (converted to DEXA equivalent activity). The length of stay in ICU, patients in the MPS group had significantly lesser duration by 29.4% (p = 0.002) given the poor survival rate of 9.1% as compared to 28.8% in DEXA group (p = 0.033). Discussion: Our results show the mortality benefit of using DEXA in moderate to severe COVID ARDS, ventilated patients above 65 years of age. Our results (9.0mg of DEXA for 13.5 days) corroborate with the RECOVERY trial which showed lower 28-days mortality in patients. A study done on Severe COVID ARDS treated with a short course of MPS had a mortality rate of 37%, however, it included only 35% of the study population having P/F<100 until day 7 of admission. On the contrary, our study with 68% of severe COVID ARDS seen admission, should have a Mortality rate of 90%. Thus, the more severe population of COVID-19 patients in the present study could be the reason that overruled the beneficial effect of MPS in severe COVID ARDS patients. Conclusion: In our retrospective analysis, we observed a higher mortality rate in moderate to severe COVID ARDS patients receiving MPS as compared to the DEXA group.

References

A Clinico-Bacteriological Study of Urinary Tract Infection in Type 2 Diabetes Mellitus in a Tertiary Care Hospital in North Eastern Part of India
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Background: Patients with diabetes mellitus (DM) experience more frequent and complicated urinary tract infections (UTI), more so in females. In recent years, there has been growing research to identify the clinical profile of UTI in diabetic patients. However, such studies are sparse in the Indian sub-continent. Aims and objectives: To study the prevalence, clinical presentation, and bacterial pathogens responsible for UTI in type 2 DM patients and their antimicrobial sensitivity. Materials and methods: This hospital-based observational study was done in Aditya Diagnostics and Hospital between November 2019 and October 2021 in 210 patients of type 2 DM, with symptoms suggestive of UTI (both old and newly detected) in 18 years and above fulfilling eligibility criteria. Subsequently, detailed history, signs/symptoms of UTI, and laboratory investigations for blood and urine samples were obtained. Organisms were identified and their sensitivity to common antibiotics was checked. The t-test was used for analyzing quantitative data, the Mann-Whitney test for non-parametric data, and the Chi-square test for categorical data. The significance threshold of the p-value was set at <0.05. Results: The mean age of the study was 55.61 years with 44.2% of cases being over 60 years of age with a male predominance (57.6%). The mean duration of diabetes was 7.51 years with 25.2% of cases having diabetes for over 10 years of age. Significant bacteriuria was observed in 30.5% of diabetic cases with a mean age of the cases with bacteriuria being 59.23 years as compared to 53.88 years of cases without bacteriuria (p < 0.05). The prevalence of bacteriuria was significantly higher in females as compared to males (p < 0.05). A total of 43.4% of cases with a duration of diabetes ≥10 years had significant bacteriuria as compared to 29.1% and 20.4% among cases with a duration of diabetes 5–10 years and < 5 years respectively (p < 0.05). The most common symptom observed in the study group was fever (40.6%) followed by pain (31.3%) and dysuria (20.3%). Urgency and pyuria were observed in 18.8% and 17.2% of cases respectively. A total of 59.4% of cases were asymptomatic. The most common organism isolated was E. Coli (64.1%) followed by Klebsiella (18.8%) and Pseudomonas (15.6%). Other organisms were Proteus (9.4%) and Enterococci (7.8%). Over half of the E. Coli isolates were observed to be resistant to cephalosporins. High cephalosporin resistance was also observed among other isolates as well. Pseudomonas and proteus isolates also showed high resistance to aminoglycosides and nitrofurantoin. Good sensitivity was shown by all organisms for higher antibiotics like tigecycline, imipenem, and colistin. Conclusion: Urinary tract infections are frequently encountered in diabetics, more in females and with longer duration of DM. E. coli was the most common organism. Because of the great proportion of asymptomatic forms (59.4%), the urine culture should be performed in all hospitalized patients with diabetes. Culture sensitivity shows that common antibiotics like cephalosporins and aminoglycosides are not good choices to start on an empirical basis in diabetic UTI.
cases considering the resistance pattern. Most importantly, this finding may be used to control trends of antibiotic-resistance, to develop local antibiotic policies and to assist clinicians in the rational choice of antibiotics therapy.

Delirium in ICU. Incidence and Associated Risk Factors from Two Tertiary Care Centers in East India

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Background: The incidence and risk factors for delirium in patients admitted to intensive care units (ICU) in India are less known. We aimed to find the incidence and risk factors for delirium in critically ill patients admitted to two ICUs in Eastern India. Methods: This is an analysis of prospectively collected observational data in the mixed medical-surgical ICUs of two tertiary care teaching hospitals over six months. All adults admitted to the ICU for more than 48 hours were included. A trained nurse screened patients for delirium using a CAM-ICU worksheet. Other relevant data that influence delirium, such as demographics, the severity of illness, sedation, comorbidity, length of stay, and mortality, were also recorded. Conducted as a part of a quality improvement audit. Results: There are 444 patients were included. The incidence of delirium was 39.9%. Hypoactive delirium was more prevalent (56.5%) than mixed (30.2%), and hyperactive (13.3%) types. On univariate analysis, factors at admission associated with significant delirium were higher Charlson’s index (3.9 ± 1.6 vs 2.7 ± 1.3), higher serum urea (mg) (65.3 ± 23.4 vs 46.1 ± 21.0), and lower sodium mg/dL (127.7 ± 7.7 vs 132.8 ± 12.0). Intensive care unit factors significantly associated with delirium were mechanical ventilation (77.4% vs 46.6%) and midazolam use (72.2% vs 27.8%) (p < 0.001). On logistic regression, Charlson’s index (OR 1.43), serum sodium (OR 0.9), serum Urea (OR 1.02), Sedation with Midazolam (OR 3.7), Mechanical ventilation (OR ~2.09), and length of stay (OR 1.08) significantly associated with delirium (p < 0.05). Delirium showed an association with increased length of stay (8.1 ± 5.4 vs 5.7 ± 3.8, p < 0.001) and mortality (18.6% vs 11.6%, p < 0.05). Conclusion: Nearly 40% of patients in this audit of ICU had delirium and were primarily hypoactive type. Higher Charlson’s index, hyperuricemia, hyponatremia, mechanical ventilation, midazolam sedation, and length of stay in ICU influence the development of delirium in critically ill patients admitted to ICU in our study. There was an increase in the length of stay and mortality in patients having delirium. Based on the above finding various nonpharmacologic and pharmacologic measures were taken in ICU to reduce delirium. Keywords: CAM-ICU, Charlson index, Delirium, Length of stay (LOS), RASS, risk factor.

Phenotypic and Genotypic Characteristics of Carbapenem-Resistant Enterobacteriaceae (CRE) in a Tertiary Care Hospital – A Prospective Cohort Study

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DOI: 10.5005/jp-journals-10071-24411.107

Introduction: Enterobacteriaceae are natural inhabitants of human intestinal tract, they can cause opportunistic infections in urinary tract, respiratory tract, bloodstream, intra-abdominal, skin and soft tissue etc. in both community and hospital settings. Infections due to these organism associated with high mortality because of antimicrobial resistance. Carbapenems are broad spectrum β-lactam antimicrobial agents used as a last resort against many multi drug resistant, gram negative bacteria, and in cases of infections due to extended spectrum beta lactamase (ESBL) and Amp C enzyme producing Enterobacteriaceae. There are two major mechanism responsible for CRE apart from the membrane impermeability and active efflux in Enterobacteriaceae first one is production of carbapenemase and other one is non carbapenemase like extended-spectrum β-lactamase (ESBL) and/or Amp C cephalosporinase (AmpC). In this prospective cohort study, our aim is to know the genotypic character of carbapenemase production in CRE and its association with adverse clinical outcomes, in 450 bedded tertiary care hospital. Materials and methods: Single center, prospective, observational cohort study in different ICUs of 450 bedded tertiary care hospital for duration of 6 months duration after getting ethical committee approval. Patients of 18–75 years, who are in sepsis and ICU stay for more than 48 hours and their culture sample or multiplex PCR growing CRE is included in this study whereas patient refusal and severe comorbidity like advanced staged malignancy, malignant stroke or intracerebral hemorrhage, head injury, moderate – massive hemorrhage, thorax injury, etc. are excluding criteria. This prospective cohort study is started after ethical committee approval. Informed written is obtained from all the patients. After the enrolment of the patient for the study, demographical details clinical parameters, hospitalization history, routine investigation results, used antibiotic for empiric therapy is noted. Culture samples is send according to hospital ICU protocol, i.e., two 10 mL blood culture either from peripheral vein or one central and one peripheral vein, urine samples, and sputum or endotracheal culture or BAL sample. Enterobacteriaceae isolation is identified by Vitek 2 automated system (bioMérieux, France) with ID-GNB card and antibiotic susceptibility test will be done by Vitek AST-GN cards/GP cards. For breakpoint value CLSI 2022 M100-S23 will be used. There are two ways to detect genotype pattern and first one is if any culture sample showing growth of CRE by phenotyping then xpert carba – R used for genotyping. Another method is to use sample for molecular genotyping by gold standard polymerase chain reaction (PCR) directly and know the pattern. All the data presented as mean ± standard deviation or median and inter-quartile range, as appropriate. Categorical variables will be compared using Pearson’s χ² test or Fisher’s exact test, whereas non-categorical variables will be tested using a t-test. Discussion: Carbapenemase production is one of the principle cause of antibiotic resistance in Enterobacteriaceae. KPC, IMP, oxa-48, NDM, and VIM are some of the most commonly involved in carbapenemase production genotype from all over world. Carbapenem resistance gene (bla KPC, bla IMP, bla VIM, bla NDM, and bla OXA-48) identified by multiplex PCR and gene sequencing methods. The presence of mcr genes (mcr-1 to mcr-9) was tested in all colistin-resistant isolates with PCR. PCR products were sequenced and aligned with reference sequences.
in the GenBank database. It has been shown in previous study that rapid PCR identification of microorganisms is, high sensitivity, more cost effective and fast turn around time (around 2–8 hour) for managing sepsis than conventional culture method. It help to provide earlier adequate treatment, so reduces inadequate empiric antimicrobial treatment. The importance to identify gene will also help to delineate the factors which lead to colonization with CP-CRE so that it could be curtailed. **Results and conclusion:** Study is about to conclude next month so result and conclusion will be discussed during presentation.

**References**


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**A Prospective Observational Study to Assess the Role of Sonographic Assessment of Fluid Estimate (SAFE) Score for the Assessment of Intravascular Volume Status In Critically Ill**

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DOI: 10.5005/jp-journals-10071-24411.108

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<table>
<thead>
<tr>
<th>Exam type</th>
<th>Exam method</th>
<th>Score assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echo</td>
<td>(i) Place the patient in a supine position if no contraindications.</td>
<td>Assign a score for the cardiac function as follows:</td>
</tr>
<tr>
<td></td>
<td>(ii) Place a phased array transducer at the left sternal border 4–5th intercostal space (Figure 1).</td>
<td>(i) EF &gt;70%, hyperkinetic = –1</td>
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<td></td>
<td>(iii) Obtain a long-axis view of the heart, note the cardiac function, and estimate the ejection fraction using the eyeballing method or the M-mode with the maximum systole and diastole measurements.</td>
<td>(ii) EF 50–70%, normal = 0</td>
</tr>
<tr>
<td></td>
<td>(iv) Obtain a short-axis view of the heart, note the cardiac function, and estimate the ejection fraction.</td>
<td>(iii) EF &lt;50%, hypokinetic = +1</td>
</tr>
<tr>
<td></td>
<td>(v) Store the images for review.</td>
<td></td>
</tr>
<tr>
<td>Lung</td>
<td>(i) Place the patient in a supine position if no contraindications.</td>
<td>Assign a score for lung water as follows:</td>
</tr>
<tr>
<td></td>
<td>(ii) Place a phased array or linear transducer perpendicular between two ribs in all 4 lune sectors, L1–4 on the right and left (Figure 2).</td>
<td>(i) Add the number of B-lines counted from all segments examined, and then divide by the number of segments examined for the average.</td>
</tr>
<tr>
<td></td>
<td>(iii) Count the number of B-lines in each sector.</td>
<td>(ii) Average &lt; 1 B-lines = –1</td>
</tr>
<tr>
<td></td>
<td>(iv) Store the images for review.</td>
<td>(iii) Average 1–2 B-lines = 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(iv) Average 3 or more B-lines = +1</td>
</tr>
<tr>
<td>IVC</td>
<td>(i) Place the patient in a supine position if no contraindications.</td>
<td>Assign a score for the IVC as follows:</td>
</tr>
<tr>
<td></td>
<td>(ii) Place a phased array or curvilinear transducer midline in the epigastric area to locate the IVC.</td>
<td>(i) 2.5 cm in diameter and &gt;50% variation in diameter during respiration = –1</td>
</tr>
<tr>
<td></td>
<td>(iii) Measure the IVC diameter just distal to the right hepatic vein, with the maximal and minimal diameter.</td>
<td>(ii) 1.5–2.5 cm in diameter and &lt;50% variation in diameter during respiration = 0</td>
</tr>
<tr>
<td></td>
<td>(iv) Calculate the collapsibility index: [(maximal diameter - minimal diameter)/maximal diameter] × 100.</td>
<td>(iii) 2.5 cm in diameter and &lt;50% variation in diameter during respiration = +1</td>
</tr>
<tr>
<td></td>
<td>(v) During spontaneous breathing, the maximal diameter will be during expiration and the minimal during inspiration, and the opposite is true during mechanical ventilation.</td>
<td></td>
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<tr>
<td></td>
<td>(vi) Store the images for review.</td>
<td></td>
</tr>
<tr>
<td>UV</td>
<td>(i) Place the head of the bed at 30 degrees if no contraindications.</td>
<td>Assign a score for the UV as follows:</td>
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<tr>
<td></td>
<td>(ii) Place a linear transducer across the patient’ neck in the area of the cricoid cartilage. Hold the transducer with no pressure applied to the vein.</td>
<td>(i) 40% respiratory variation = –1</td>
</tr>
<tr>
<td></td>
<td>(iii) Obtain the largest diameter image of the UV.</td>
<td>(ii) 20–40% respiratory variation = 0</td>
</tr>
<tr>
<td></td>
<td>(iv) Measure the maximal and minimal diameter at the largest diameter point and the respiratory variation.</td>
<td>(iii) 20% respiratory variation = +1</td>
</tr>
<tr>
<td></td>
<td>(v) Calculate the collapsibility index: [(maximal diameter - minimal diameter)/maximal diameter] × 100.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(vi) Store the images for review.</td>
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**Objectives:** To compare the volume status assessed by the physician with routine clinical subjective or objective methods (POCUS/static and dynamic methods) with the Sonographic Assessment of Fluid Estimate score (SAFE) score in critically ill patients. **Materials and methods:** This pragmatic prospective observational study was conducted in the Medical ICU of Narayana health city Bangalore. The study included adults aged > 18 years and who needed volume status assessment as decided by the treating intensive care physician. The study period was 6 months between August 2021 and February 2022. The sample size was calculated using Keith, et al., study as a reference. The calculated sample size was 98 subjects. Patients who had a local infection or trauma to the chest and increased abdominal pressure/intracranial pressures were excluded from the study. Patient volume status in selected patients was initially assessed by the senior ICU physician using his preferred methods and patients were categorized as euvolemic/hypov or hypervolemic. Then SAFE score was used which utilizes lung ultrasound findings, LV function by Echo, IVC, and IJV parameters which categorizes patients as hypervolemic/euvolemic/hypovolemic, based on a scoring system calculated (-1, 0, +1) for each zone evaluated using ultrasound. Both methods were compared for their agreement. **Results:** In our study, the SAFE score was concurring with physician’s methods in assessing the volume status with a kappa value was 0.91, which had statistically significant agreement. We found that the SAFE score had high validity in predicting volume status compared to methods used by the physician in assessing the volume status in critically ill patients with 100% sensitivity and specificity for identifying hypervolemic and hypovolemic but only 57.47% specificity for identifying euvolemic patients when the score value was <= 1. We also found that SAFE score and physician’s methods had good agreement across various ejection fraction groups. The sub-group analysis of the study in the following sub-groups like Mechanically ventilated patients, ARDS patients, Patients who had vasopressor requirements, and Patients who had septic shock, the volume status assessed by the physician’s methods and the SAFE score had a statistically significant agreement. Additionally measured variables like Mean Arterial pressure, Cumulative fluid balance, and Acid-base status, i.e., metabolic acidosis and lactate levels were compared with volume status assessed by SAFE score and physician’s methods and had a statistically significant correlation with the volume status assessed. **Conclusion:** Bedside sonography is a routine investigation done in all medical intensive care unit patients by the physician for baseline volume status assessment. Sonographic assessment of fluid estimate score would be a point of care, objective, cost, and time-effective non-invasive method, with the highest validity, compared to routine invasive and non-invasive methods used by the senior physician in critically ill medical ICU patients. We observed a SAFE score of >=2 more likely represents hypovolemia; >=2 represents hypervolemia and -1 to 1 represents Euvolemia. Future studies in different ICUs and correlations with different static and dynamic measures of volume assessments in the critically ill may be warranted to validate the score.

**Diagnostic Accuracy of ROX-HR Index in Predicting HFNC Outcome in Adult Patients with Hypoxic Respiratory Failure – Prospective Observational Study**

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DOI: 10.5005/jp-journals-10071-24411.109

**Background:** The ROX index (ratio of pulse oximetry/Fio2 to respiratory rate) has been validated to predict high-flow nasal cannula therapy (HFNC) outcomes in patients with pneumonia. Modified ROX criteria that incorporate heart rate appear to be promising tool in the early identification of patients who are at high risk of HFNC failure in patients initiated on HFNC for acute respiratory failure. The relevance of ROX HR index has not been studied in the Indian population with acute hypoxic respiratory failure. **Objective:** Our study is conducted to determine the sensitivity and specificity of ROX HR index measured at 4 hours and 10 hours after initiation of HFNC therapy in predicting HFNC outcome in patients with acute hypoxemic respiratory failure. **Materials and methods:** The study design is a single center, open-label, prospective observational study. 45 patients admitted to multi-disciplinary ICU with acute hypoxemic respiratory failure initiated with HFNC therapy were included. ROX-HR index was defined as the ratio of ROX index over heart rate (beats/min), multiplied by a factor of 100. ROX HR index was calculated at the 4th and 10th hours after initiation of HFNC. Based on the outcome, patients were divided into two groups. The first group was those liberated from HFNC and 2nd group was those who failed HFNC and progressed to mechanical ventilation. Comparison and analysis of ROX HR index were done between these two sets of patients: HFNC success group and HFNC failure group. The evaluation was performed using the area under the receiving operating characteristic curve (AUROC) and cutoff value were assessed for prediction of HFNC failure which was defined as the need for mechanical ventilation. **Results:** There are 83 patients were initiated on HFNC for acute hypoxemic respiratory failure. The majority of patients had COVID-19 pneumonia as a primary diagnosis. About 57 patients were liberated from HFNC to ventury masks while 26 patients were initiated on invasive mechanical ventilation due HFNC failure. ROX HR index measured at the 4th and 10th hours were lower in those with failed HFNC compared to those liberated from HFNC. The cut-off value of ROX HR index at 4th hour ≤ 8.42 predicts a higher risk of HFNC failure with a sensitivity of 76.9% and specificity of 68.4% (AUC = 0.722 (0.594 – 0.850), p = 0.001). While ROX HR index at 10th hour has a cut-off value of ≤ 9.51 predicts a higher risk of HFNC failure with sensitivity of 65.4% and specificity of 70.2% (AUC = 0.682 (0.547 – 0.817), p = 0.008). **Conclusion:** ROX-HR index at 4th hour of ≤8.42 and 10th hour ≤ 9.51 were significantly associated with a higher risk of HFNC failure (95% CI 0.594 – 0.850 and 0.547 – 0.817 respectively) ROX-HR index appears to be a promising tool for early identification of treatment failure in patients initiated on HFNC for acute hypoxemic respiratory failure.

**Digital Health Service in Remote Terrain – A viable and Innovative Service for Intensive Care in India's North East State – Manipur**

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DOI: 10.5005/jp-journals-10071-24411.110

In the Current era, life span is prolonged, and these aging populations are having high rates of co-morbid conditions. With the integrated medical electronic advancement and innovation, many life-threatening diseases are diagnosed and treated in the Intensive care unit. However Intensive care unit is high-risk and the most expensive, contributing as much as 30% of hospital costs. In India, 80% of physicians are located in urban areas while 70% of...
the population resides in remote locations that suffer from a severe shortage of doctors and trained intensivists. Challenges are met while setting up high-acuity intensive care units in remote locations due to a lack of funding, technology, and staffing resources. At the same time, transferring critically sick patients over difficult terrain to a well-equipped urban ICU is both time-consuming and risky. This imbalance in critical care availability is associated with high costs and high rates of morbidity and mortality. Digital health in an ICU, known as tele-ICU, by using audio-visual and patient surveillance systems to link a critical-care team of nurses, doctors, and intensivists from a remote hospital to a large, multi-specialty facility. Tele ICU enables immediate, standardized care to critically sick patients, increases accessibility to intensive care, and supports efficient utilization of limited resources to benefit a larger percentage of the remote population. The clinical impacts of tele-ICU are reflected in terms of hospital and ICU mortality, length of stay, and ICU costs which are published in reputed articles. Manipur, a north eastern state of India was equipped with state-of-the-art tele ICU facilities at J.N. Institute of Medical Sciences in April 2022 in a joint venture with the Government of Manipur and e-Gov. foundation. Out of 16 remote spokes in the hilly terrain of Manipur, JNIMS served as the Command center providing the clock tele – monitoring and tele – consultation service. We have provided cares to more than 500 patients in 8 months thereby decreasing healthcare expenditures to patients, and providing timely clinical decisions. The details of the data will be produced during the presentation. The departments of anaesthesiology, JNIMS along with other clinical departments are providing mentoring and training session to doctors and nursing staff of peripheral spokes ICUs a regular interval to strengthen the tele ICU services.

Comparison of Continuous Positive Airway Pressure Ventilation vs Bi-level Positive Airway Pressure Ventilation in Patients with Blunt Chest Trauma

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DOI: 10.5005/jp-journals-10071-24411.111

Background: Positive pressure ventilation (PPV) has helped to reduce the overall morbidity and mortality linked to blunt chest trauma, although IMV is associated with a number of problems. It has not been thoroughly established how noninvasive ventilation (NIV) is used to treat individuals who have suffered blunt chest damage. This study compared the effectiveness of CPAP and BiPAP in preventing IMV. Method: This retrospective study was carried out in the period between January 2018 and October 2022, on 60 patients admitted to the trauma ICU of Trauma Center, BHU with blunt chest trauma with acute respiratory distress that had deteriorated despite aggressive medical management. Patients were randomly assigned to receive either continuous positive airway pressure ventilation (CPAP) (Group I) n = 20 and Bi-level positive airway pressure ventilation (BiPAP) (Group II) n = 20 or IMV (Group III) n = 20. Results: After the start of assisted ventilation, improvements in gas exchange and relief from respiratory distress were seen in the three groups under study. 30% (n = 6) in Group I and 25% (n = 5) patients in Group II required endotracheal intubation. There was no significant difference was found in age, gender, arterial Ph PaCO2, PaO2:FIO2, RR, HR, Mean blood pressure, ISS and SAPS between all the 3 groups. Length of stay in ICU between the three groups was also comparable. The incidence of nosocomial pneumonia and mortality was significantly high in Group III as compared to Group I and Group II (p < 0.05). On comparing reasons for NIV failure, 3 patients in Group II and no patients in Group II had hemodynamic instability (p < 0.05). Discussion: The non-significant difference in ICU stay duration between the 3 groups in our study were inconsistent with prior studies. This can be explained by the fact that patients with more serious underlying conditions who were excluded from the present study’s patient group on invasive ventilation were included in the standard invasive patient group in the earlier trial (like comatose patients). In earlier studies, the rate of adverse events related with NIV usage ranged from 8 to 13.8%, with the most common reported adverse events being nosocomial pneumonia and pneumothorax. Because patients with severe central nervous system damage and low Glasgow coma scale scores were excluded from the study, it is possible that this contributed to the low mortality rate that was observed in the participants. Studies have shown that central nervous system damage is an independent predictor of mortality in polytrauma patients. Conclusion: When treating respiratory failure and lowering the likelihood of intubation in patients with acute chest injuries, CPAP and BiPAP are both secure and effective management strategies.

Dermatological Manifestations in the Intensive Care Unit: A Prospective Study

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2Government Medical College, Jammu, Jammu & Kashmir, India, DOI: 10.5005/jp-journals-10071-24411.112

Background: Intensive care unit is a specialized controlled unit where the critically ill patient is dependent on the caregivers. Aims: This study was carried out to study the dermatological manifestations in patients admitted in intensive care unit. Materials and methods: It was a prospective study carried out over a period of 6 months where the patients admitted in the intensive care unit having some dermatological manifestations were examined and the findings were noted. Results: A total of 273 patients were examined (M:F – 154:119) were examined out of which 50 patients (18.31%) were having some dermatological manifestations were examined and the findings were noted. Conclusions: Of the dermatological conditions with the most common being fungal infections (26%, n = 13) and bacterial infections (16%, n = 8). Among the non-infectious dermatoses, the most common were drug reactions (24%, n = 12), followed by friction blisters (12%, n = 6) and dermatitis (4%, n = 2).

An Observational Study to Identify the Relationship between VExUS Scoring and Right Ventricular Dysfunction in Predicting Adverse Renal Events: A Pilot Study

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1Manipal Hospitals, Bengaluru, Karnataka, India
DOI: 10.5005/jp-journals-10071-24411.113

Indian Journal of Critical Care Medicine: ABSTRACTS CRITICARE – IJCCM2023
Introduction: Hemodynamic management in critically-ill patients has traditionally focused on forward flow and maintaining adequate cardiac output by relying on fluid administration and vasopressor/inotropic support. Volume Responsiveness-based strategies do not assess elevations in right atrial pressure (RAP) or venous congestion which could occur earlier than patient becomes a non-responder. Venous pressure is often overlooked as a hemodynamic parameter and if high can lead to Organ perfusion afterload and microcirculatory tamponade, leading to organ dysfunction. RV dysfunction is a proven independent risk factor for development of Acute Kidney Injury (AKI) and mortality in the ICU. It may have an independent effect on VEXUS scoring. Hence, our study aims to study the relationship between VEXUS score and RV function with respect to the incidence of Adverse Renal Events (ARE) which includes AKI, RRT and/or death.

Methodology: A Prospective observational study was conducted among 88 patients with a good Ultrasonographic window, admitted into a Multidisciplinary-ICU of a tertiary care center. Patients with Congenital heart disease, severe Tricuspid regurgitation, Cirrhosis and portal hypertension, renal/hepatic transplants, pregnancy, and CKD on hemodialysis were excluded. Using a semi-structured questionnaire, demographic, clinical, and laboratory data were collected. Ultrasonographic assessment of RV function was done as per ASE guidelines along with VEXUS scoring at the end of day 1 of the ICU. All the patients were followed until Discharge/death or until 7 days of stay whichever happened earlier. Incidence of ARE was monitored along with improvement or worsening of AKI and/or requirement of RRT. The collected data was analyzed using SPSS ver22 and P-value<0.05 was considered statistically significant.

Results: The mean age of the study population was 56.4 ± 19.9 years with 61.4% were males. Among 88 cases, the incidence of ARE was 28.4%. The mean APACHE II and SOFA score at the admission was 18.4 (95% CI 16.7–20.1) and 7.1 (95% CI 6.3–8.0) respectively. The overall case mortality in the study was 18.2%. The cumulative fluid balance at day 7 in cases with ARE was high when compared to cases with no ARE (+6492mL vs +3153mL). The incidence of ARE was high in cases with RV dysfunction (62.5% vs 8.9% with OR:17) which was statistically significant. Severe the grades of doppler flow patterns in hepatic, portal and renal vein are associated with higher incidence of AKI. Cases with higher VExUS score had significantly higher incidence of ARE (Grade II–71.4% and Grade III–92.9%). On multinominal regression analysis VExUS score can predict ARE events independent of RV dysfunction (p<0.05). Conclusion: VExUS score grades venous congestion at the bedside and is an easy skill to acquire, especially in the absence of other reliable objective tests to quantify venous congestion. RV dysfunction is an independent risk for adverse renal events including death. Higher VEXUS scores identify congestive phenotypes and predict Adverse Renal Events independent of RV dysfunction. Our study adds to the growing evidence of the importance of moving away from volume-responsiveness-based resuscitation to venous congestion-based volume-tolerant resuscitation which improves outcomes.

Use of Non-vented Bain Circuit in Refractory Hypoxic COVID Patients with NRBM and HFNO in Resource Poor Set Up

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2SCB Medical College, Cuttack, India

Objective: Use of Non-Vented BAIN Circuit in Refractory hypoxia due to COVID-19 pneumonia in resource-poor hospitalized severe COVID patients due to critical scarcity of oxygen in this part of the world we have been working on different oxygen-preserving modalities without compromising patient’s oxygenation status. We found that a modified conventional Bain circuit with a modified BIPAP MASK with APL Valve for release of patient’s expired air and oxygenation through BAIN has saved many precious lives whose hypoxia was refractory in HFNO and NRBM. Objectives to find out the effectiveness of BAIN circuit with BIPAP Mask as a better option for in hospitalized severe and critical COVID patients who are on HFNO or NRBM and have refractory hypoxia despite very high oxygen flow and proning. Methods: From 15 April 2021 to 14 May 2021 in our state government controlled COVID hospital 15 severe and critical COVID patients were studied. These patients were on NRBM initially and subsequently shifted to HFNO as satisfactory oxygen levels were not achieved despite maximum fio2/Proning and medical therapy including IV methylprednisolone as well as Remdesivir. Then they were subjected to BAIN circuit with modified BIPAP mask with APL valve at the patient end. Drastic improvement was seen from an hour onwards in terms of SPO2, Respiratory rate reduction, decreased oxygen requirement to maintain satisfactory SPO2 Level, and significantly increased recovery and discharge.

Results: Out of our cohort of 15 severe and refractory hypoxic patients despite protocollized NRBM and HFNO with very high oxygen requirement and deteriorating clinically when changed over to BAIN circuit with modified face NIV mask, 11 patients recovered smoothly and we lost only 4 patients as they had critical COVID and severe comorbid conditions. CO2 retention is also not raised in patients with BAIN circuit ventilation with a bipap mask.

Conclusions: A modified BAINs circuit with a modified bipap mask with an APL valve near the patient end should be the first line of choice for severe and critical COVID hospitalized patients rather than NRBM and HFNO as the previous one saves a huge amount of oxygen, easy to use, cheap (approximate cost of a set is 10$) and superior outcome than later two methods.

Listeria Monocytogenes Meningitis in an Immunocompetent Patient

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Objective: The purpose of this article is to emphasise the possibility of Listeria monocytogenes invasive disease (in this case meningitis) occurring in previously healthy individuals and to raise awareness about the need for LM to be considered in the differential diagnosis of atypical presentations. Patient and methods: A previously healthy 25-year-old man presented with typical clinical features of meningitis. Cerebrospinal fluid (CSF) was obtained on the day of admission for biochemical and microbiological investigations. In addition, blood was also taken for culture and hematological studies. Antibiotic susceptibility test was performed using the Etset method. Microscopic examination of the CSF showed pleocytosis, which was predominantly lymphocytic, while the biochemical investigation revealed raised concentrations of protein and lactic acid as well as decreased glucose concentration. A 24-hour culture yielded...
pure growth of gram-positive bacilli identified by standard methods as L. monocytogenes. It was susceptible to ampicillin and trimethoprim-sulfamethoxazole. The patient was treated with intravenous ampicillin combined with gentamicin and made a complete recovery. **Conclusion:** This presentation describes an unusual case of meningitis caused by L. monocytogenes in a previously healthy young adult with no risk factor. Only a few similar cases have been reported in the literature. **Keywords:** Listeria monocytogenes, meningitis, antibiotics, atypical clinical manifestation, immunocompetent patient. **Introduction:** Listeria monocytogenes (LM), the main species of the Listeria genus, is a Gram-positive facultative anaerobic intracellular bacterium widely distributed in the environment, which has the ability to grow at refrigeration temperatures (at 4°C). It is generally transmitted to humans through ingestion of contaminated food (ready-to-eat food, deli meats and soft cheeses). The primary bacteraemia, after ingestion, is followed by dissemination in the central nervous system (CNS), endocardium and for pregnant women, invasion of the placenta and foetus. It principally affects specific groups of patients: pregnant women, neonates, the immunocompromised (especially if cell-mediated immunity is impaired), and the elderly, potentially causing life-threatening infections such as bacteriæmia and meningoencephalitis. However, there are also case reports of Listeria infections in previously healthy and immunocompetent patients, which may be associated with severe complications and a high mortality rate (for meningitis, 20–50%). L. monocytogenes is becoming an important cause of community-acquired acute meningitis. The meningitis it causes differs from the other types of meningitis in epi_demiology, clinical features, cerebrospinal fluid (CSF) findings, treatment and prognosis. The organism is intrinsically resistant to the third-generation cephalosporins that are used empirically for the treatment of bacterial meningitis. In addition, any delay in initiating appro priate therapy may lead to a poor outcome with high mortality rate, which may reach up to 30%. It is important that the clinician should be familiar with the features of this infection in order to recognize and manage it successfully. The aim of this study was to report a case of meningitis caused by L. monocytogenes in a previously healthy immunocompetent adult patient. This report presents a case of LM meningitis in an immunocompetent adult without significant past medical history or specific risk factors (the first case identified in our hospital in the last 10 years), discussing the atypical presentation, the diagnostic challenges encountered, the treatment challenges and the final outcome. **Case presentation:** A previously healthy 20 years male patient presented to the hospital with fever of three days, vomits and headache of two days and altered in sensorium of one day. On examination, the patient presented normal vital signs, including normal blood pressure, heart rate, oxygen saturation and temperature. The cardiorespiratory and abdominal examinations were also normal. The neurological examination showed an irritable and dis-orientated patient with convergent strabismus and left palpebral ptosis, signs of meningeal irritation and no other neurological findings. Blood tests on admission showed an elevated white cell count (WCC) (15.48 ×10^9 /L) and normal electrolytes. The MRI of the brain performed showed findings. The lumbar puncture (LP) was performed and the cerebrospinal fluid (CSF) was sent to the Laboratory for microbiological and biochemical investigations and biofire (meningitis panel). Following the preliminary LP results, a diagnosis of bacterial meningitis was suspected and empirical antimicrobial therapy was initiated with ceftriaxone 2g/12h and vancomycin started. The patient was also prescribed dexamethasone 8mg/12h. A referral to the Infectious Diseases (ID) team was made requesting a review. After evaluating the patient, the ID team recommended CSF culture, immunology screening and antibiotic treatment as prescribed. By the end of day 3 of his admission and after receiving the first doses of the above-mentioned therapy, the neurological signs and symptoms improved, and the patient reported the resolution of diplopia. The CSF culture results confirmed the diagnosis of Listeria bacterial meningitis. LM was identified using Matrix Assisted Laser Desorption/Ionisation-Time of Flight (MALDI-TOF) mass spectrometry and VITEK 2 Compact System. For antimicrobial susceptibility testing, disc diffusion method was used (according to the European Committee on Antimicrobial Susceptibility Testing guidelines (EUCAST): 5% sheep blood Mueller–Hinton agar, incubation at 35±1° C for 24 hours, in CO2 atmosphere), which showed that the strain was susceptible to amoxiciillin-clavulanic acid, ampicillin, erythromycin, linezolid, tetracycline and vancomycin and resistant to clindamycin. (Oxoid™ antimicrobial susceptibility discs and Etest® strip for vancomycin). The Clinical status improved with complete recovery and the patient was discharged on day 21 with the recommendation to continue the antibiotic treatment with oral ampicillin 500mg/12h for seven more days. The patient was reviewed by the Infectious Disease team in their Outpatient Department 10 days after discharge, finding that he has made a full recovery. To the best of authors’ knowledge this was an isolated case, not being linked to any outbreaks of listeriosis. The patient did not present an occupational risk, and the dietary history was of no significance for Listeria infection. This case report was approved by the Ethics Committee of “Pius Brînzeu” County Clinical Emergency Hospital Timisoara, no 241/1.05.2021. Written informed consent, including consent to publish, was obtained from the patient. **Discussions and conclusion:** LM is the third most common cause of bacterial meningitis in adults.4 Typically, patients with LM from the susceptible groups present with signs and symptoms similar to those of meningoencephalitis from other causes: fever, headache, neck stiffness, altered mental status and neurological deficits. Case reports of LM meningitis in healthy individuals occur very rarely. They may atypically present with general “flu-like” illness (fever, diarrhoea, headaches, nausea, vomiting, myalgias) or may be completely asymptomatic.3 This case concerns meningitis in a patient with an atypical presentation, having mainly neurological signs and symptoms that initially led to a suspicion of organic brain lesion, without specific symptoms to support a diagnosis of bacterial meningitis. Ruling out the cerebrovascular pathology by imaging (MRA) guided the diagnosis toward an infectious cause. The current empirical antibiotic treatment guidelines for community-acquired bacterial meningitis4 does not cover the treatment for LM in immunocompetent patients between 18 and

<table>
<thead>
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<th>CSF Results:</th>
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<tbody>
<tr>
<td>WBC</td>
<td>480 cells/mm^3</td>
</tr>
<tr>
<td>Polymorphs</td>
<td>59%</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>38%</td>
</tr>
<tr>
<td>Glucose</td>
<td>37mg/dL</td>
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<tr>
<td>Protein</td>
<td>144 mg/dL</td>
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<tr>
<td>Chloride</td>
<td>121mg/dL</td>
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50 years of age, therefore the appropriate antibiotic treatment for LM meningitis in this case was delayed. In one study regarding the traits of LM in Romania, Caplan et al showed that a high percentage of young immunocompetent patients without any predisposing conditions were diagnosed with listeriosis, when compared with other European countries, most likely secondary to food products contaminated with high loads of LM. This could suggest that LM should be considered in the differential diagnosis of patients presenting with atypical neurological symptoms or those that do not improve on the classical treatment, regardless of age group or past medical history, especially in countries with a higher risk of infection with LM. Furthermore, LM should not be suspected only in immunocompromised patients, as this was reported in 20% of the patients with no specific risk factors. There are only few cases of invasive listeriosis in previously healthy individuals described in the literature. An interesting case of severe LM rhombencephalitis is described by Cao et al, equivalent to our case. The symptomatology was atypical, and the patient presented with only neurological signs on admission.7 Jamal et al presented another interesting case of LM meningitis in an immunocompetent adult with no past medical history and without occupational exposure. Similar to our case, the source of infection could not be determined.8 Another case of meningitis caused by LM in a previously healthy patient is described by Brebenariu et al. In this case, the source of infection was occupational exposure.9 Furthermore, Tiri et al in their case reviews presented an interesting case of LM brain abscess in an immunocompetent adult patient. The treatment of choice for bacterial meningitis caused by LM remains amoxicillin, ampicillin or penicillin G, according to the most recent European Society of Clinical Microbiology and Infectious Diseases (ESCMID) guidelines. Some studies found other antibiotics, such as vancomycin, linezolid, quinolones, gentamycin, meropenem, and chlor_amphenicol, to also be effective against Listeria species in vitro. However, the clinical data were insufficient to make strong recommendations for any of these agents in Listeria meningitis. The patient also received dexamethasone in the first few days of his admission as part of the empirical treatment given for bacterial meningitis. The use of dexamethasone for patients diagnosed with bacterial meningitis is controversial. The meta-analysis by Brouwer et al supports the adjunctive dexamethasone treatment to prevent an inflammatory response, decreasing overall hearing loss and neurologic sequelae, but with no effect on the overall mortality. In another systematic review, van de Beek et al concluded that treatment with steroids was associated with a significant reduction in mortality and neurological sequelae.17 Conversely, other studies had no findings to support the benefits of dexamethasone. In the literature, there are studies reporting hyponatraemia as a common finding in patients diagnosed with bacterial meningitis, especially when caused by LM. In this case, the patient presented with severe hyponatraemia of 128 mmol/l, which improved to 133 mmol/l along with the patient’s symptoms, by day 3 of admission, with only gentle intravenous (iv) fluid therapy.19 We presented this case to raise awareness about LM as a possible cause for bacterial meningitis in immunocompetent patients with uncharacteristic clinical symptoms and to confirm that linezolid is a viable treatment option for patients with LM meningitis leading to favourable outcomes. Disclosure: The authors report no conflicts of interest in this work.

References

Active Surveillance of Carbapenem-resistant Enterobacteriales (CRE) and Predetermine the Antibiotics Regime to Tackle Menace of CRE Infection and Mortality
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DOI: 10.5005/jp-journals-10071-24411.116
Introduction and objectives: The identification of CPE carriage through the active rectal surveillance of patients is an effective way
Cardiopulmonary resuscitation (CPR) serves as the first line drugs for Cerebrovascular Accident (CVA) or stroke is the cause of death and the third-leading cause of death and disability. It is the second-leading most common life-threatening disorder. It is important to identify and control cardiovascular risk factors at an early age to prevent cases of young AMI.

**Methodology:** A prospective observational study was done in Jehangir hospital, Pune from October 2020 to April 2022. This study incorporated 58 patients as per inclusion criteria. A detailed cardiovascular examination was done in all patients. All the points mentioned in the proforma were recorded. The diagnosis of MI was established based on the following criteria:

- Temporal profile of MI
- Clinical examination
- Hematological and biochemical investigation

A 12 lead ECG and 2D echocardiography were done in the emergency department. All patients were subjected to the following panel of investigations:

- Hematological and biochemical investigations:
  - Complete blood count
  - Blood sugar level
  - Serum electrolytes.
  - CK-MB
  - cTnT
- Other: Lipid profile

Patients who have abnormal changes in the cardiac workup that is ECG and ECHOCARDIOGRAPHY are admitted into the ward/ICU. An in-hospital follow-up was done following admission. These patients were followed up to see if an early diagnosis of these abnormal changes helped the patient receive appropriate treatment and patient had a good prognosis thereafter. Results were analyzed with reference to age, sex, and risk factors, and clinical examination.

**Results:** This study comprised of 58 patients, majority of them were males. Most of the patients belonged to age group of 41–50 years. The most common symptoms were chest pain (65.5%) followed by perspiration (37.9%), left arm pain (22.4%) and breathlessness (20.7%). Smoking (69.0%) was the most common risk factor followed by dyslipidemia (53.4%), sedentary lifestyle (50.0%). Of 58 patients studied 34 cases (58.6%) had AWMI, 19 cases (32.8%) had IWMI, 3 cases (5.2%) had ALMI and 2 cases (3.4%) had other type of MI (inferoposterior). Conclusion: The present study has shown that acute myocardial infarction is more common in males than in females. Anterior wall MI was the most common type of MI. Smoking, dyslipidemia, and sedentary lifestyle were the most common risk factors.

**Study of ECG and Echocardiography Changes In Acute Cerebrovascular Accidents**

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**Introduction:** Cerebrovascular accident (CVA) or stroke is the most common life-threatening disorder. It is the second-leading cause of death and the third-leading cause of death and disability combined in the world. Stroke, or cerebrovascular accident,
is defined as an abrupt onset of a neurological deficit that is attributable to a focal vascular cause. Cerebrovascular accidents can be further Ischemic (85%) or Haemorrhagic (5%). A new emerging branch named Neurocardiology is a specialty that deals with interactions between the heart and the brain, i.e., the effects of brain injury on the heart and vice-versa. The brain injury-induced myocardial injury can be evaluated by recording, the ECG and Echocardiography changes and cardiac biomarker evaluation. Objectives: To study the various changes in ECG and Echocardiography patterns in acute cerebrovascular accident patients. To assess whether such changes have any prognostic significance. Methodology: This is a Prospective Observational Study. Patients will be selected based on the inclusion and exclusion criteria. In the Emergency, the diagnosis of CVA will be established based on the following criteria:

- Temporal profile of clinical syndrome
- Clinical examination
- CT scan of brain/MRI of Brain

A 12-lead ECG and 2D echocardiography will be done in the Emergency Department. There are 67 patients with acute stroke were considered and ECG and 2D Echo of these patients were done in the emergency department on arrival. In the hospital, follow-up was done to know the prognosis of all patients. Results: T-wave abnormalities (inversions, flattening, tall) were the most common ECG abnormality in all the three groups 47.2% in ischemic, 60.7% in hemorrhagic, and 66.7% in CVST followed by QT prolongation 38.8% in the overall study population and then QRS complex abnormalities 24.4% in the overall study population. LV dysfunction was the commonest abnormality noted in both groups i.e., infarct (80.6%) and hemorrhage (82.1%) followed by LV hypertrophy (62.7%), mitral wall and aortic wall abnormality, i.e., 46.3% and 23.9% respectively among infarct group. The distribution of incidence of mortality did not differ significantly between the group of cases with normal and the group of cases with abnormal overall ECG status in the Ischemic type of CVA group (p-value > 0.05). The distribution of incidence of mortality did not differ significantly between the group of cases with normal and cases with abnormal overall Echocardiography status in the Ischemic and Haemorrhagic type of CVA groups (p-value > 0.05 for both). Conclusion: T wave abnormalities, QTc prolongation, and abnormal QRS morphology are common ECG abnormalities in hemorrhagic strokes and ischemic strokes. LV dysfunction is the most common echocardiographic abnormality in stroke patients. ECG abnormalities in stroke patients do not have any prognostic significance in predicting mortality in CVA. 2D Echocardiographic abnormalities in stroke patients do not have any prognostic significance in predicting mortality in CVA.

Electroencephalography and Bispectral Index Reactivity to Predict Outcome in Unconscious Patients with Acute Severe Traumatic Brain Injury

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Introduction: Electroencephalography reactivity (EEG-R) to sensory stimuli reflects the functional integrity of the underlying cortex, therefore, helps in prognostication. Several studies pointed out that the presence of EEG-R is a useful tool to prognosticate patients with impaired consciousness. Bispectral Index (BIS) primarily a depth of anesthesia monitor, has also been used as a surrogate of GCS to monitor the level of consciousness. It spares the patient from repeated noxious stimuli and helps predict recovery from unconsciousness. However, none of the studies evaluated BIS reactivity (BIS-R) to predict the outcome.

Objectives: The objective of this study is to evaluate incidence of EEG-R and BIS-R to painful and auditory stimuli in unconscious patients with acute severe traumatic brain injury (sTBI) with Glasgow coma scale- motor (mGCS) ≤4 and its correlation with outcome assessed at discharge by coma recovery scale-revised (CRS-R) and at 3 months by Glasgow outcome scale extended (GOSE). Materials and methods: Patients with mGCS ≤4 were recruited between the 3rd and 5th day of injury after obtaining written informed consent. EEG electrodes were attached in a 10–20 system whereas BIS was applied on side of relatively normal hemiscrnia. After recording a baseline EEG and BIS value, two painful stimuli (fingernail bed pressure) and auditory stimuli (two claps) were given on either side with two minutes intervals between each stimulus. Two raters tested the EEG-R (visual change in either frequency or amplitude). A change in BIS value by 10 was considered as BIS reactivity (BIS-R). Each patient was assessed at discharge by CRS-R and at 3 months. The qualitative analysis was done by Chi-square test/McNemar’s test. The inter-rater agreement was analyzed by the Kappa coefficient. Results: A preliminary analysis of 20 patients with completed 3 months follow-up has been done. Out of 20 patients, EEG-R was absent in 8 patients with an observed mortality of 100% at 3 months (7 succumbed at discharge). Whereas, in 12 patients with positive EEG-R, observed mortality at 3 months was 50% i.e., six patients (1 at discharge and 5 post-discharge). The mortality difference in both groups was significant (p = 0.04). The average BIS value after the painful stimulus in the absent EEG-R group was 51.25 whereas in the present EEG-R group was 67 (p = 0.20). All patients in the present EEG-R group had a better score on CRS-R at discharge as compared to those with absent EEG-R (p = 0.07). Though the GOSE at 3 months was not significant (p = 0.295). The inter-rater agreement was moderate to high for all stimuli except the first painful stimulus. Discussion and conclusion: In the present study patients with absent EEG-R had 100% 3-month mortality as against present EEG-R (50%). At discharge, CRS-R was better in EEG-R present group as compared to the absent. BIS values were low in EEG-R absent group, though the difference was not statistically significant. EEG-R seems to be a useful tool to predict short-term outcomes in unconscious patients with acute TBI. Also, BIS-R which is less cumbersome and less time-consuming may serve as an additional tool to EEG-R to prognosticate patients with poor GCS. Though, larger sample size studies are required to observe the clinical utility of both.

References


How Well Do We Feed the Critically Ill Patients? (We Feed): A Multi-Centric, Prospective Observational Study

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DOI: 10.5005/jp-journals-10071-24411.120

Introduction: Nutritional therapy is a very important aspect of the management of critically ill patients. These patients need intensive monitoring, various organ supports in the form of vasoressors and inotropes, mechanical ventilation, dialysis, extracorporeal organ support, infection controls, etc. In this very complex, critical, and demanding scenario, nutritional therapy often gets a back seat in the initial period at least till the time patient gets stable. But this nutritional deprivation has much more deleterious effects in sepsis and systemic inflammatory response syndromes induced catabolic state than that of fasting in healthy persons. Various studies showed that inadequate feeding has been associated with an increased hospital length of stay, the incidence of complications, infections, the incidence of organ failure, and the risk of mortality. A single-center prospective study that analyzed 768 patients reported that 69% were calorie deficient and 90% were protein deficient. They also observed a positive correlation between calorie deficit and infectious complications, length of ICU stay, and days of mechanical ventilation. The main factors may hinder enteral feeding and adequate nutrition delivery. That includes delay in the initiation of EN and slow infusion rate; low adherence to EN practice guidelines; frequent disruptions to EN due to diagnostic or therapeutic procedures. In observational studies, patients in the ICU who were fed early through the enteral route have had a better outcome than those who were not. Similarly, overfeeding has also been associated with various complications, including hyperglycemia, hypertriglyceridermia, hepatic steatosis, azotemia, and hypercapnia, and an increased rate of mortality among patients. Therefore, optimum nutrition is vital to a patient’s survival. The present prospective observational multi-centric study will assess the nutritional status of critically ill patients, cumulative calorie and protein balance, and the effect of calorie and protein balance on clinical outcome. Methods: Study design and settings: The “We Feed” study is a large prospective multi-centric observational study evaluating nutritional therapy in critically ill patients and will be conducted in different ICUs in India.

Inclusion Criteria: All adult patients who are treated in the intensive care unit and receive either enteral or parenteral nutrition will be included in the study.

Exclusion Criteria: Following patients will be excluded from the study: Age less than 18 years old. Pregnant women. Data collection and quality control: All data will be collected by an investigator or a research assistant using a uniform form or electronically. Following data will be collected diagnoses, nutritional status, severity score total ventilators days, total ICU stays, 28th day mortality, daily calories, and protein goal and intake, factors that hinder adequate calorie and protein intake if any, cumulative calorie and protein balance when the patient is discharged from ICU, dies or lives till seven days from the day of admission. Outcomes: The primary outcome of the study will be cumulative calorie and protein balance. Secondary outcomes will be factors that hinder adequate calorie and protein intake, the correlation between initial nutritional status and calorie and protein deficit with a length of ICU stay, ventilator days, and 28 days mortality. Sample size: This study aims to recruit more than 1000 critically ill patients who receive either enteral or parenteral nutrition admitted to more than 10 ICUs. These sample sizes of the patients and ICUs will allow for capturing the variation related to nutritional therapy among ICUs. The recruitment will be for 6 months at each center. Sampling and selection bias due to the over-representation of some centers may skew the results. To avoid this type of bias, we will limit the data collection to less than 50% of the total patients per center. Statistical analysis: The data will be tested for normality by using Kolmogorov–Smirnov or the Shapiro–Wilk test. Categorical variables will be presented as frequencies and percentages, and continuous variables will be presented as the means with the SD or medians with the IQR. Correlation between the variables will be tested using logistic regression analysis. Subgroup analysis will be done patients for example on patients admitted to medical vs surgical ICU. Ethics and dissemination: This study will be conducted by the principles of informed consent.
**Data Collection Form**

Patient ID:

Type of ICU (medical, surgical, organ transplant etc):

Age: Wt: Sex: Height: BMI: Apache score:

Diagnosis:

Nutritional status using NUTRIC/NRS score: High/ Low VBEN/RBEN Total ICU days

Ventilator Days:

Need of organ support:

28 days mortality: Time interval between admission initiatives of EN: Estimated calorie and protein requirement: Use of parenteral nutrition:

<table>
<thead>
<tr>
<th>Days</th>
<th>Calorie(P)</th>
<th>Protein(P)</th>
<th>Calorie</th>
<th>Protein</th>
<th>GI Comp</th>
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</table>

Cumulative Protein and Calorie balance: Factor hindering adequate nutrition:

P stands for prescribed

Data may be collected for the who are admitted for seven days in ICU

of the Helsinki declaration and good clinical practice. This study will be reported according to the guidelines of the Helsinki declaration and good clinical practice. This study will be reported according to the guidelines of Strengthening the Reporting of Observational Studies in Epidemiology. The study will be commenced after taking institutional ethical committee clearance and registration of protocol with the clinical trial registry of India (CTRI). All centers that will participate in the study will also take approval from their respective ethic committee. The need for informed consent will be waived due to the observational nature of the study. The results of the study will be disseminated to the participating hospitals, submitted to peer-reviewed journals for publication, and presented at scientific congresses. Study time line: Anticipated initiation and completion of various phases of study has been depicted in the Gantt chart:

**References**


**Prospective Observational Study to Compare the Stroke Volume and Cardiac Output Measurement by Conventional 2D Echocardiography and Hemodynamic Monitor Using Multi Beat Analysis Method in Critical ICU Patients**

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DOI: 10.5005/jp-journals-10071-24411.121
Objectives: To compare the stroke volume and cardiac output measurement by 2D echocardiography, and a hemodynamic monitor using the multi-beat analysis method, in critical ICU patients and to understand the interchangeability and consistency of data obtained from both methods. To compare the stroke volume and cardiac output measurement by 2D echocardiography, and a hemodynamic monitor using the multi-beat analysis method, in critical ICU patients and to understand the interchangeability and consistency of data obtained from both methods. Materials and methods: A single center, prospective observational study was performed.

Inclusion Criteria:
- Patients with >18 years of age admitted to SL Raheja hospital within 48 hours.
- Patient in septic shock with or without inotropic support; Noradrenaline: 0.025–1 μg/kg/minute
- Cardiogenic shock dose: Noradrenaline: 0.05 to 0.4 μg/kg/minute
  - Adrenaline: 0.01–0.5 μg/kg/minute
  - Vasopressin: 0.01–0.04 units/minute
- Mechanically ventilated and non-ventilated patients.

Exclusion Criteria:
- Age <18 years
- Low cardiac functions.
- Post cardiac surgery
- Patients with triple inotropic high support;
  - Noradrenaline: 1–3.3 μg/kg/minute
  - Adrenaline: 0.5–2 μg/kg/minute
  - Vasopressin: >0.04 units/minute

After screening 350 patients admitted to the ICU, 50 patients were included in the study. The stroke volume and cardiac output were measured via the Retia Argos monitor which uses a multi-beat analysis algorithm, via an arterial line. The data were collected simultaneously via the conventional 2d echo method, and the values for stroke volume and cardiac output were recorded. The 2D echo was used as a comparison instead of the gold standard thermiodilution by Pulmonary Artery Catheterization as it has near equivalent accuracy and is the conventional modality in the ICU with the added benefit of non-invasiveness. For data analysis, descriptive statistics frequency analysis and percentage analysis were used for categorical variables and the mean and SD were used for continuous variables. To find the agreement between the variables Intra class correlation was used and represented the Bland-Altman plot of agreement and the Critchley and Critchley criterion. Results: A probability value of 0.05 with a confidence interval of 95% was considered statistically significant. The data collected for stroke volume and cardiac output from both methods had a probability value of 0.0005, indicating a highly significant level of agreement. ICC values for stroke volume and cardiac output by both methods demonstrated excellent reliability. The Bland-Altman plot showed a strong level of agreement. The Argos monitor was well below the Critchley and Critchley criterion for agreement between two CO methods (<30%). Conclusion: Data was collected and analyzed from the hemodynamic monitor and 2d echo, and it was found that values for cardiac output from both methods showed a strong level of agreement. The data from this study proves the hypothesis and establishes a statistically significant relationship between the two methods with an excellent reliability value. This study is important since through the monitor, vital hemodynamic data can be obtained through an arterial line, hence eliminating the need for highly skilled personnel as required by 2D echo. As no special skill or training is required for this method, it can be valuable in a primary healthcare setup. However, this study excluded patients with cardiac pathologies and low ejection fraction, data needs to be collected including these patients to assess the accuracy of this monitor in the management of cardiogenic shock.

Extracorporeal Monitoring and Manipulation of Circulating Molecules in Blood: Proposed Process
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DOI: 10.5005/jp-journals-10071-24411.122

Introduction: Real-time monitoring of molecules and ions circulating in the blood is a desirable goal particularly relevant to critically ill patients. Such monitoring is not only crucial for understanding molecular interactions that are nonlinear, complex, and dynamic but also has direct application for the management of critically ill patients. Present-day sensors for glucose, lactate, and electrolytes suffer from limitations mostly due to interference from non-target molecules circulating in the blood and the intervening tissue between blood and the sensor. The purpose of the presentation is to highlight the necessity of invention and explain the scientific principles that form the basis of the invention. The invention is patent pending in India and USA. Objectives: To design a process, which can facilitate simultaneous real-time monitoring of multiple circulating molecules in the blood. That such monitoring is possible without the patient losing any blood and there must be minimal interference from the non-target molecules and ions. Manipulate levels of multiple circulating molecules in the blood, without using any drug. That such multiple manipulations should be simultaneous, selective, and controlled. Material and methods: After perusal of relevant literature and a comprehensive analysis of practicality, an extracorporeal process was designed. The practicality of design was ensured keeping in view existing technology. The process entails an extracorporeal circuit wherein whole blood is fractionated into cellular and plasma components thereby eliminating interference by cellular components. The simultaneous monitoring of multiple circulating molecules in plasma can be carried out by multiple embedded sensors. Sensors can be any combination of optical or electrochemical nature. To further minimize interference by non-target molecules, plasma can be further fractionated with one fraction carrying most of the target molecules. Measurements can be carried out in both fractions. To manipulate the levels of circulating molecules without any drug, the process of chemical capture is proposed wherein magnetized capturing molecules are designed to specifically react with and capture the target molecules. Post-capture, both used and unused capturing molecules can be removed via magnetic suitable forces. As a corollary of fractionation with real-time monitoring in the preceding step, such manipulation can be effected in a selective and controlled manner in contrast to present-day dialysis and adsorption techniques. Results: As per European Patent Office (EPO) report, out of 44 claims of the invention, 41 are innovative and inventive and all claims have 100% industrial applicability. The opinion essentially means that it can be built with the present-day technology and underlying scientific principles are sound and robust. Discussions: Individual components of the proposed process such as extracorporeal circulation, plasmapheresis, fractionation based on molecular weight and charge, selectively permeable membranes, and magnetized capturing molecules have all been built and are in
Cardiac Arrhythmias in Medical Intensive Care Unit of a Tertiary Care Hospital

Ashreen Kaur1, Deepak Bhasin2, Devinder Midha3, Harpal Singh4
1-4Max Super Speciality Hospital, Mohali, Punjab, India

Study of Incidence, Risk Factors and Outcome of New Onset Cardiac Arrhythmias in Medical Intensive Care Unit of a Tertiary Care Hospital

Indian Journal of Critical Care Medicine: ABSTRACTS CRITICARE – IJCCM2023

Difficult Visualization of Larynx in Intensive Care Unit

Vikas KN
Ramaiah Medical College and Hospital, Bengaluru, Karnataka, India

Indian Journal of Critical Care Medicine: ABSTRACTS CRITICARE – IJCCM2023
patients, Midline neck swellings, Gross anatomical abnormality, Recent surgery of the head and neck, Upper airway disease (e.g. maxillofacial fracture or tumors), Loose teeth, or those requiring a rapid sequence or awake intubation were excluded from the study. A single experienced intensivist, blinded to the results of the airway evaluation, performed all of the direct laryngoscopies and graded the views using the modified Cormack and Lehane scale. DVL was defined as a Grade 3 or 4 view. Results: The study done on 301 patients included 152 male (50.50%) and 149 female (49.50%) patients. The highest sensitivity 26.30% observed in predicting DVL was with HMDR (26.30%), followed by HMD at extreme head extension (14.29%), HMD at the neutral head position 10%, and lowest with TMD (9.68%). Whereas the specificity in this study was relatively high. The highest specificity was 98.48% observed in predicting DVL with HMDR, followed by HMD at the neutral position at 97.15%, and TMD at 96.30%. and HMD at the extreme of head extension at 94.14%. Discussion: This study was undertaken with the purpose to evaluate the usefulness of HMDR for predicting DVL in normal patients. The pre-Intubation airway predictors of the HMD in a neutral position, HMD, and thyromental distance (TMD) at extreme head extension, and HMDR were examined. Finally, although DVL is a major determinant for difficult Intubation, it is not synonymous with difficult intubation. In this study, we defined the modified Cormack and Lehane method grades III and IV as an indicator of DVL. We could demonstrate that HMDR is a very reliable predictor of DVL to a great extent because of its higher specificity and sensitivity.

References

COST-EFFECTIVE HUMANIZED CARE IN INDIA: CAN WE IMPLEMENT FAMILY-LED HOME REHABILITATION FOR BEDRIDDEN TRACHEOSTOMIZED ICU PATIENTS?

Evaluation of the Feasibility, Acceptability, and Outcomes of the All India Institute of Medical Sciences ICU Rehabilitation Intervention (AIR)
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DOI: 10.5005/jp-journals-10071-24411.125

Objectives: The need for tracheostomy in chronic critical illness and the dearth of rehabilitation services prolong ICU and hospital stays, infections, and costs for patients, families, and the healthcare system. We aimed to evaluate the feasibility and acceptability of the AIR pilot intervention. Materials and methods: Design- Mixed–methods research design at AIIMS Bhubaneswar hospital and patients’ homes across Odisha, India. There are 150 tracheostomized ICU patients plus family carer dyads were recruited to the project along with healthcare workers (HCWs) and administrative stakeholders. The AIR is a family-led intervention with four components: handheld training of carers in trach care, suctioning, nasal feeding and bed care, equipment bank, and bespoke mHealth application for supported home discharge and follow-up support at home over the telephone and home visits. The preliminary intervention was field tested with 70 tracheostomized ICU patient-carer dyads followed for one month. The finalized intervention was tested on 150 dyads from all over Odisha in the second phase. Primary and secondary outcome measures of the feasibility and acceptability of the intervention were assessed by the intervention acceptability measure, the feasibility of the intervention measure, and the appropriateness of intervention measures (IAM, FIM, AIM). Length of hospital stay, Carer burden, and patient quality of life were assessed as secondary outcomes. Results: Field testing identified process-related issues, which resulted in iterative revisions in the intervention design and implementation plan. Out of 180 patient carers assessed, 172 were referred for counseling, and 150 were recruited between April 2021 and March 2022. AIR intervention was feasible and acceptable. The median scores of IAM, FIM, and AIM were >98% for dyads, ICU nurses, doctors, and administrative personnel who felt that the intervention was appropriate, feasible, and acceptable, with findings supported by qualitative interviews. There are 118 dyads completed 100% of predischarge intervention components. The reasons for not completing all in-hospital components were the death of patients 75%, carers losing interest in the intervention 20%, or improvement 5%. Carers needed a median of 3 training sessions of 45 minutes to achieve high subjective confidence in caring for their bedridden patients. The mHealth app was used actively by 40% of dyads. Equipment bank was used by 85% of dyads with two instances of misuse/loss. Home visits, telephone follow-ups, and mHealth communication between HCWs and dyads were rated very highly (9.8/10). Survivor dyads who accepted AIR were discharged home within 2 days, whereas dyads who did not accept the intervention had a LOS stay of 13 days. At home follow-up, the QOL of patients improved over a 1-month post-discharge and the carer burden decreased to acceptable levels. There was no loss to follow-up after home discharge. The readmission rate was <2%. Conclusion: nd acceptable in our ICU context. Preliminary results suggest a decrease in length of stay, and multicentric effectiveness evaluation with cost analysis and process evaluation are planned next steps.

Viral Myocarditis and Encephalitis – A Rare Presentation of HHV-6
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DOI: 10.5005/jp-journals-10071-24411.126

Introduction: HHV-6 infects nearly 100% of human beings during childhood and often results in fever, diarrhea, and rash. HHV-6 reactivation usually occurs in immunosuppressed patients, and can lead to complications like pneumonitis, encephalitis, myocarditis,
and hepatitis. **Objective:** We present a case of HHV-6 infection with an atypical presentation in an immunocompetent adult. **Material and methods:** A 55 years old male patient known as diabetic and hypertensive presented with fever and shortness of breath for 2 days and an episode of abnormal tonic-clonic movements of all four limbs followed by loss of unconsciousness for a few hours. The patient was intubated. He had a heart rate of 100/min, blood pressure unrecordable, temperature 98.70°F, and SpO2 92% on ambu mask, GCS E1V1M4, pupils normal size, normally reacting, with bilateral plantar extensor. The patient was put on mechanical ventilation, and inotropic support was initiated. A screening echo revealed a normal ejection fraction but the posterior wall appeared hypokinetic. Trop I was 114 pg/dL. CT’s head was normal. The patient was started on intravenous antibiotics and optimal fluid therapy. Although dengue, rapid typhi, malaria, scrub typhus, HIV, HCV, and Leptospirosis were all negative, the causative organism was still uncertain and his cardiac markers were rising. The patient improved clinically and was weaned successfully and extubated after 3 days. After regaining consciousness and the ventilatory support, CNS examination revealed vertical gaze palsy and frank cerebellar signs. MRI brain was normal. EEG was suggestive of a normal awake state. CSF rapid PCR examination revealed HHV-6. **Discussion:** HHV-6 is a ubiquitous agent that infects almost all individuals in early childhood and is capable of becoming reactivated in both normal and immunocompromised hosts. HHV-6 encephalomyelitis has mostly been implicated in immunocompromised hosts. But in the present case, the patient had no evidence of immunosuppression such as HIV, malignancy, tuberculosis, etc. Denes et al. demonstrated a case of HHV-6 infection in a 20 years old female with 3 weeks history of asthenia, myalgia, low-grade fever, blurred vision, urinary retention, and no immunological problems. She was treated with cidofovir and ganciclovir and recovered completely. The patient in the present case was treated with Acyclovir initially and was then shifted to Valacyclovir afterward. HHV-6 has the capability to infect vascular endothelium and can cause myocarditis and subsequent chronic cardiomyopathy which was also observed in this case as seen by rising levels of Troponin T and the presence of hypokinesia on echocardiography although endomyocardial biopsy was not done. Hence, this was a very unusual presentation of HHV-6 infection, and that too, in an immunocompetent patient.

**References**


**Table 1:** Comparison of shock indices, traditional scores, and MSOFA & DSOFA in Predicting mortality (n = 50)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>AUROC</th>
<th>95% CI</th>
<th>p</th>
<th>Sn</th>
<th>Sp</th>
<th>PPV</th>
<th>NPV</th>
<th>DA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSOFA</td>
<td>0.823</td>
<td>0.688–0.959</td>
<td>&lt;0.001</td>
<td>68%</td>
<td>97%</td>
<td>93%</td>
<td>83%</td>
<td>86%</td>
</tr>
<tr>
<td>DSOFA</td>
<td>0.824</td>
<td>0.689–0.96</td>
<td>&lt;0.001</td>
<td>68%</td>
<td>97%</td>
<td>93%</td>
<td>83%</td>
<td>86%</td>
</tr>
<tr>
<td>qSOFA</td>
<td>0.643</td>
<td>0.492–0.795</td>
<td>0.074</td>
<td>32%</td>
<td>94%</td>
<td>75%</td>
<td>69%</td>
<td>70%</td>
</tr>
<tr>
<td>SOFA</td>
<td>0.775</td>
<td>0.617–0.933</td>
<td>0.001</td>
<td>58%</td>
<td>97%</td>
<td>92%</td>
<td>79%</td>
<td>82%</td>
</tr>
<tr>
<td>SI</td>
<td>0.791</td>
<td>0.655–0.918</td>
<td>0.001</td>
<td>79%</td>
<td>74%</td>
<td>65%</td>
<td>85%</td>
<td>76%</td>
</tr>
<tr>
<td>MSI</td>
<td>0.745</td>
<td>0.61–0.881</td>
<td>0.004</td>
<td>95%</td>
<td>42%</td>
<td>50%</td>
<td>93%</td>
<td>62%</td>
</tr>
<tr>
<td>DSI</td>
<td>0.746</td>
<td>0.61–0.882</td>
<td>0.004</td>
<td>95%</td>
<td>52%</td>
<td>54%</td>
<td>94%</td>
<td>68%</td>
</tr>
</tbody>
</table>

AUROC, area under ROC curve; CI, confidence interval; DA, diagnostic accuracy; DSOFA - SOFA calculated with DSI instead of MAP; MSOFA - SOFA score calculated with MSI instead of MAP; NPV, Negative predictive value; p, p-value value; PPV, Positive predictive value; Sn, Sensitivity; SOFA- Sequential organ failure assessment score; Sp, Specificity; qSOFA, quick sequential organ failure assessment score.
Department. Shock indices identified patients who are prone to an adverse outcome better than SIRS or qSOFA. The two modified scores i.e., MSOFA and DSOFA showed improved sensitivity and improved the diagnostic accuracy of the traditional SOFA scoring system in predicting mortality.

Steroids in Moderate and Severe COVID-19 Acute Respiratory Distress Syndrome Intensive Care Unit Patients; A Single Centred Retrospective Observational Study

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DOI: 10.5005/jp-journals-10071-24411.128

Objective: The relatively high infectivity and rapid progression of lung involvement of COVID-19 infection made corticosteroid potential drugs to counteract the hyper-inflammatory response in the lung reducing rate of progression to acute respiratory distress syndrome (ARDS). The predominantly used steroids were Dexamethasone (DEXA) and Methylprednisolone (MPS). The retrospective analysis was to compare the mortality of moderate and severe Covid-19 ARDS patients admitted to the ICU and treated with either DEXA or MPS. Material and methods: Out of 204 patients, from March 2020 to March 2021, admitted to our ICU, the non-ventilated group had 75 and 34 whereas the ventilated group had 52 and 33 Covid-19 patients who were treated with DEXA and MPS respectively. Their data on demographics, comorbidities, and severity index at admission (APACHE II, CTSI, CORAS, Partial pressure of oxygen) were collected. Results: In non-ventilated patients: In both DEXA and MPS groups, patients were of similar demographics, severity index, and comorbidities. Patients belonging to the MPS group had a shorter duration treatment of steroids but a higher median dose of 12 mg vs 8 mg (p = 0.001) of MPS (converted to DEXA equivalent activity). The mortality and length of stay in the ICU did not differ for both groups. In mechanically ventilated patients, there was also no significant difference in demographics, severity index [P/F<100 50% vs 69.4%, NS], and comorbidities. In the MPS group, the duration of treatment was significantly less by 48.2% when compared to the DEXA group. These patients were treated with a higher dose of MPS 15 mg vs 9 mg (p = 0.001) (converted to DEXA equivalent activity). The length of stay in ICU, patients in the MPS group had significantly lesser duration by 29.4% (p = 0.002) given the poor survival rate of 9.1% as compared to 28.8% in the DEXA group (p = 0.033). Discussion: Our results show the mortality benefit of using DEXA in moderate to severe COVID ARDS, ventilated patients above 65 years of age while no effect on non-ventilated patients. Our results corroborate with the literature on DEXA vs MPS for non-ventilated patients with studies by Salton et al (2021) and Ko et al., (2021). However, for ventilated patients, Ko et al., and Saeed MAM et al., have demonstrated significant benefits in mortality with MPS while Ranjarb et al., (2021)’s data although on a similar line, did not reach statistical significance. Salton F et al.’s data on ventilated patients on prolonged, higher doses of methylprednisolone did not reduce mortality at 28 days compared to conventional dexamethasone in COVID-19 pneumonia. While Fatima et al concluded that Dexamethasone and methylprednisolone both were equally effective in treating moderate to severe COVID-19 disease. In fact, similar to our study, they observed higher mortality in the MPS group as compared to DEXA group. Conclusion: In the retrospective analysis, we observed no significant mortality benefit in the non-ventilated patient between the two steroid groups. Importantly in the moderate to severe, COVID ARDS ventilated patients we found higher mortality in MPS as compared to the DEXA group.

References


Evaluation of Epidemiology and Resistance Patterns of Intensive Care Unit Infections: A Single Centred Prospective Observational Study

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DOI: 10.5005/jp-journals-10071-24411.129

Introduction: Incidence of nosocomial infections in the intensive care unit (ICU) is rising in most published studies regarding epidemiology, the microbiology of ICU-acquired infections such as ventilator-associated pneumonia (VAP), catheter-associated urinary tract infections (CAUTI) and catheter-related bloodstream infections (CRBSI) have come from western countries. Variations in the incidence, microbiology, and resistance patterns in Indian ICUs are not well understood yet. This applies to our own ICU too. Hence, we sought to perform this study, to evaluate the incidence of ICU-acquired infections and the associated morbidity and mortality. Objectives: Primary: To evaluate the incidence of ICU-acquired infections at our tertiary care critical care department. Secondary: To evaluate the morbidity and mortality associated with these ICU acquired infections. Methodology: Single center, prospective observational study. We included Patients with ICU stay ≥48 hours. Patients aged...
<18 years of age, index ICU stay <48 hours, and sample for culture collected within 48 hours of admission was excluded. Approval from the institutional ethics committee was obtained. Currently, the study is ongoing. **Sample size**. We aim to include the maximum number of cases (fulfilling our inclusion criteria). All baseline parameters were noted. Standard sampling and culture techniques followed.

**Results**:

<table>
<thead>
<tr>
<th>Total number of admissions: 2554</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of admissions &gt;48 hrs-1276</td>
</tr>
<tr>
<td>Excluded number of cases: 51 (40-culture sent &lt;48 hrs of admission, 11-&lt;10.5 CFU)</td>
</tr>
<tr>
<td>Culture positive cases included: 164 (12.8%)</td>
</tr>
<tr>
<td>VAP-88 (6.8%) CRBSI-29 (2.2%) CAUTI-47 (3.6%)</td>
</tr>
</tbody>
</table>

### Total demographic data:

<table>
<thead>
<tr>
<th></th>
<th>VAP (%)</th>
<th>CRBSI (%)</th>
<th>CAUTI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>88</td>
<td>29</td>
<td>47</td>
</tr>
<tr>
<td>Age</td>
<td>52.65 ± 17.14</td>
<td>52.1 ± 18.2</td>
<td>54.6 ± 17.2</td>
</tr>
<tr>
<td>Gender</td>
<td>(68/20)</td>
<td>(22/7)</td>
<td>(30/17)</td>
</tr>
<tr>
<td>APACHE II Score</td>
<td>15.24 ± 6.17</td>
<td>15.9 ± 5.3</td>
<td>14.6 ± 6.1</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Medical</td>
<td>42</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Surgical</td>
<td>45</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>VAP</th>
<th>CRBSI</th>
<th>CAUTI</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella Pneumoniae</td>
<td>25</td>
<td>3</td>
<td>13</td>
<td>41 (25)</td>
</tr>
<tr>
<td>Acinetobacter Baumanii</td>
<td>36</td>
<td>4</td>
<td>--</td>
<td>40 (24.4)</td>
</tr>
<tr>
<td>E-Coli</td>
<td>4</td>
<td>3</td>
<td>21</td>
<td>29 (17.68)</td>
</tr>
<tr>
<td>Pseudomonas Aeruginosa</td>
<td>14</td>
<td>3</td>
<td>6</td>
<td>23 (14.02)</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Above table shows 4 most common organisms and the rate of infections in percentage. 75% of total VAP, CAUTI, CRBSI are caused by these 4 organisms. Sensitivity pattern:

<table>
<thead>
<tr>
<th>Sensitivity pattern</th>
<th>VAP (No. of patients)</th>
<th>CRBSI (No. of patients)</th>
<th>CAUTI (No. of patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAN Sensitive</td>
<td>7</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>MDR</td>
<td>72</td>
<td>18</td>
<td>47</td>
</tr>
<tr>
<td>XDR</td>
<td>6</td>
<td>1-Acinetobacter B</td>
<td>1-Klebsiella pneumoniae</td>
</tr>
<tr>
<td>PDR</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Methicillin sensitive / Resistant</td>
<td>2/1</td>
<td>0/5</td>
<td>0</td>
</tr>
<tr>
<td>Vancomycin Resistant</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Incidence of MDR, XDR, PDR cases. Maximum cases are of MDR. Causative organism of XDR cases are mentioned. No PDR case found till now in the study.

### Morbidity and Mortality:

<table>
<thead>
<tr>
<th></th>
<th>VAP</th>
<th>CRBSI</th>
<th>CAUTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU LOS</td>
<td>24.33 ± 17.49</td>
<td>29.5 ± 19.7</td>
<td>28.0 ± 19.6</td>
</tr>
<tr>
<td>Hospital LOS</td>
<td>29.76 ± 18.91</td>
<td>34.4 ± 24.1</td>
<td>32.8 ± 18.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deaths</th>
<th>VAP</th>
<th>CAUTI</th>
<th>CRBSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>23 (14.02%)</td>
<td>13</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

### Conclusion:

The data collected and studied till now in our prospective observational study shows that Gram-negative organisms are the major cause of ICU-acquired infections (92.7%),

**Common VAP organisms**: Acinetobacter Baumanii (40.9%), Klebsiella Pneumoniae (28.4%), Pseudomonas Aeruginosa (15.9%). Staphylococcus Aureus, caused 2 (2.2%) cases.
Common CRBSI organisms: *Candida species* 5 (17.2%), *Acinetobacter Baumanii* 4 (13.7%), and *Klebsiella Pneumoniae* 3 (10.3%), staphylococcus aureus caused 3 cases.

**CAUTI (n = 49)**

Common cause of CAUTI- *E Coli* –21(48.83%) > *Klebsiella Pneumoniae* –12(27.9%) > *Pseudomonas* –5(11.6%).

Gram-positive organisms caused 4.26%, and Candida species caused 3.04% of ICU-acquired infections. Among the Gram-negative organisms, MDR Acinetobacter baumanii, Klebsiella pneumonia, E-coli, and Pseudomonas caused the majority of ICU-acquired infections. The maximum number of cases was MDR (n = 137,90.28%). XDR cases caused 5.19% of infections. No PDR cases observed till now. The longer length of stay (LOS) was found in patients who acquired these infections. The mortality rate was higher in VAP (56.5%) > CRBSI (30.4%) > CAUTI (13%).

**References**


Incidence of Infection/Colonisation Due to Organisms Intrinsically Resistant to Polymyxins in Polymyxin Exposed ICU Patients

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Introduction: In ICU, emergence of new infection resistant to antibiotics is rising daily, appropriate usage of antibiotics and good infection control methods will definitely help to reduce the emergence of new infection caused by MDR resistant organisms. Extensive use of POLYMYXINS may lead to emergence of infections caused by isolates that are intrinsically resistant to POLYMYXIN a used by isolates that are intrinsically resistant to POLYMYXIN. Objectives: To determine the incidence of intrinsically resistant organisms in Polymyxins exposed ICU patients. Materials and Methods: A prospective observational study of microbiological data of all patients who are exposed to Polymyxins was done in ICU at Royal care super specialty hospital, coimbatore for a period of 6 months. The incidence of polymyxin intrinsically resistant isolates including Serratia marcescens, Stenotrophomonas maltophilia, Burkholderia cepacia, Elthabethkingia meningoseptica, Proteus mirabilis, Morganella morganii, Providencia species, Brucella sp, Moraxella catarrhalis, Neisseria sp, Chromobacterium sp was analysed. spital from May to November 2022. Results: Out of 38 patients who were exposed to Polymyxins, 7 patients developed intrinsically resistant organisms with an incidence of 18%. The average no of days the resistant isolates appeared after exposure to Polymyxins was 7 days. Out of 38, in 28 patients Polymyxins was used empirically(74%) and remaining 7(26%) patients it was used as definite treatment. Out of 7 patients who developed intrinsically resistant isolates, 5 patients [72%]were discharged alive, 1 [14%] went AMA and 1 [14%] patient died. The average duration of antibiotics in these patients was 8 days. Most of them had Polymyxins prescribed empirically and resistant organisms isolated were considered true pathogens. In patients who developed intrinsically resistant organisms mortality was around 14% who be true pathogens.

References

Cost Effective Combined Heart Lung Transplant Care with Humanisation in Tertiary Care ICU of the Medical College

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DOI: 10.5005/jp-journals-10071-24411.131

Introduction: India has 3 tier healthcare infrastructure divided between the public and private sectors. While the number of patients suffering from end-stage organ disease and waiting for an organ transplant is rising, the pool of live and cadaveric organ donors is limited. Cost constrain and the availability of proper resources add another challenge to the organ transplant drive. Here we present our experience of two patients who were discharged successfully from the medical college ICU after the complex combined heart-lung surgery. Objective: Outcome of the 2 HLT recipients who were operated and cared in the ICU of teaching medical college hospital. Materials and methods: Dr. DY Patil medical college and hospital (DYPMCH) has tertiary care ICU with round-the-clock availability of trained Intensivists. In 2022, between August and November, DYPMCH performed combined Heart Lung Transplant (HLT) surgeries on 2 females who were suffering from LAM and scleroderma-associated ILD. Critical care medicine department was involved in the management of the Brain Stem Dead (BSD) organ donor as well as peroperative management (from ICU admission to discharge) of the combined HLT. Retrospectively we analyzed the cost-effectiveness and outcomes of these 2 cases. Results: Post-HLT ICU and hospital stay of the first patient of HLT patient was 27 days while it was 29 days for the second patient. Both of them were discharged successfully from the hospital and are alive without any need for hospitalization to date. The first patient paid rupees five lakhs from her own pocket while DYPMCH sponsored rupees Three lakhs, raised a crowdfunding of rupees two lakhs, and the patient’s employer State Bank of India sponsored rupees thirty-eight lakhs. Our second patient is an Indian citizen practicing as an anesthetist in NHS UK who was going to pay in multi-crore rupees in the US/Dubai and ended up paying a total of rupees forty-eight lakhs only which was cost-effective for her and their family. Discussion: Despite the best possible medical therapy Heart and lung failure patients cannot achieve the desired quality of life with the constant threat to their life. Waiting list mortality is high due to discrepancies between potential HLT recipients and donors. The cost involved in the preoperative workup, ICU, and hospital stay during transplant followed by the cost of immunosuppressant drugs, heart-lung biopsies, and any post-transplant complications is generally a huge economic burden for many of the heart-lung transplant recipients. HLT expert surgeons, intensivists, pulmonologists, cardiologists, pathologists, and nurses are not available in every city in India too
in medical college hospital set up. **Conclusion:** Intensivists who are treating BSD patients in ICU try their best to save the lives of such patients with a multidisciplinary approach but once BSD gets confirmed pendulum changes to maintain the quality of organs in case the family of the BSD patient decides to go for the organ donation. Many ethical and humanitarian issues are tackling by the intensivists during the cadaveric organ donation process. The availability of all trained human and non-human resources under one roof at DYPMCH with successful outcomes has crossed the burden of cost and fear associated with combined HLT surgery.

**References**


**Point of Care Ultrasound in Sternal Notch for Assessment of Endotracheal Tube Tip (ETT) Position in a Tertiary Pediatric Intensive Care Unit**

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**Introduction:** The chest X-ray (CXR) is considered a gold standard to assess the tip of the endotracheal tube (ETT) in an intubated patient. Routinely in many intensive care units, there is a significant delay in getting a bedside CXR following endotracheal intubation. Bedside CXR poses an additional risk of undue radiation exposure and patient positioning-related complications. **Objectives:** The objective of our study is to find the utility of bedside ultrasound (USG) in assessing the ETT tip position when compared to CXR (gold standard) in a tertiary Paediatric Intensive Care Unit (PICU).

**Methods:** It is a cross-sectional study involving 109 patients aged from 1 month to 18 years admitted to our PICU from March 2021 to November 2022, requiring endotracheal intubation. After intubation, CXR was done to assess the correct position of the tip of ETT. Simultaneously bedside USG was done by the investigator and the distance between the tip of ETT and the arch of the aorta was measured and recorded. The USG readings were compared with the distance between the tip of the ETT and the carina in CXR. The primary investigator was blinded to x-rays until bedside USG was done. The findings were counter-checked by the consultant radiologist. The radiologist was blinded to USG findings and the USG images were revealed only after reporting the x-ray for the ET position.

**Results:** The sensitivity of the USG in identifying the correct position of the ETT when compared to CXR was 89.8% (95% CI: 77.8–96%). The specificity was 95% (95% CI: 86.1–99%). The positive predictive value was 93.6% (95% CI: 82.5–98.7%), and the negative predictive value was 91.9% (95% CI: 82.2–97.3%). The mean ± SD of the time taken for USG was 5.08 ± 1.85 minutes whereas the mean ± SD of the time taken to upload X-ray was 24.5 ± 8.87 minutes. **Conclusion:** Our study concluded that bedside USG has good sensitivity and specificity in the assessment of the tip of the ETT position in all children enrolled. Faster outcomes were achieved using bedside USG as compared with X-ray in identifying ETT position. No procedure-related complications or adverse events were observed during the study.

**References**


**Serum magnesium level in patients admitted to ICU**

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**Background:** Magnesium (Mg2+) is essential for normal cellular function and is the second most abundant intracellular cation. According to studies, 20 to 65% of critically ill patients develop hypomagnesemia during ICU stay. Patients with hypomagnesemia on admission have been found to have an important impact on mortality and morbidity. Such patients have a higher APACHE II Score, which has a poor prognosis. Hypomagnesemia is an important factor causing prolonged stay in critically ill patients admitted to ICU. It causes an increased need for ventilator support and an increased number of days on a ventilator. Hypomagnesemia will cause neuromuscular weakness and respiratory failure, hence it has been an important factor leading to weaning difficulty for patients on a ventilator. Electrolyte abnormalities are associated with hypomagnesemia, like hypokalaemia. **Objective:** To study impact of serum magnesium level on outcome of critically ill patients considering following parameter:

- APACHE II Score
- Length of stay in ICU (Hours/Days/Weeks)
- Need for ventilator support (Yes/No)
- Duration of ventilator support (Hours/Days/Weeks)
- To detect other electrolyte abnormalities associated with abnormality of serum magnesium
- Mortality

**Material and methods:**

**Inclusion criteria:**

- Patients admitted in intensive care unit (ICU)
- Male/Female patients, 18 or more than 18 years of age
- Patient/spouse/relatives who sign an informed consent document.

**Exclusion criteria:**

- The patient who had received magnesium prior to admission/at the time of admission
- Pregnant women with eclamptic seizures receiving MgSo4.
- Patient was assessed for the following parameters: APACHE II: (acute physiological and chronic health evaluation 2 is a severity of disease classification system one of several ICU scoring systems. It is applied within 24 hours of admission of a patient to an intensive care unit (ICU): an integer score from 0 to 71 is computed based on several measurements; higher scores correspond to more severe disease and a higher risk of death. APACHE 2 score will be calculated for each patient at admission to the medical ICU. Ventilator support: Ventilator support was assessed as the number of patients requiring ventilation and the duration of ventilator support in days. Length of stay in ICU: Length of stay in ICU was noted. **Mortality:** The patient was evaluated for the outcome and evaluated as improved or expired. **Conclusion:** Higher mortality rates (50.0% of the patients with magnesium levels <1.8 mg/dL expired as compared to 46.3% of the patients with magnesium levels >1.8 mg/dL), increased hospital.
Elizabethkingia meningoseptica Infections in Critically Ill Patients During 2 Years in a Tertiary Level Hospital of Western India

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Elizabethkingia is a ubiquitous organism that is widely distributed in the environment. The most commonly isolated species is Elizabethkingia meningoseptica, which was formerly known by the names Flavobacterium meningosepticum and Chryseobacterium meningosepticum. It was discovered in 1959 by an American bacteriologist, Elizabeth O King, and was later identified as the cause of neonatal septicaemia. It is a Gram-negative rod and is non-motile, a non-fermenter, and oxidase and catalase positive. It is implicated in a wide range of infections in both neonates and adults. In neonates, it is known to cause meningitis, pneumonia, bacteremia, and sepsis. Meningitis caused by E. meningoseptica is known to have a mortality rate of 57%, and hydrocephalus, deafness, and developmental delay are seen as late sequelae of the infection. It is pathogenic in both immunocompetent and immunocompromised adult patients, and the infection is usually nosocomially acquired. Pneumonia, endocarditis, postoperative bacteremia, abdominal infections, bronchitis, and meningitis are the most commonly encountered manifestations. Some of the common risk factors associated with this infection are long-term immunosuppression with drugs, underlying co-morbidities, prolonged hospital stay, previous use of higher antibiotics (Third generation cephalosporins and carbapenems), indwelling central venous catheter and other invasive devices. Elizabethkingia shows a unique sensitivity pattern and is sensitive to only a few routinely used antibiotics, such as piperacillin-tazobactam and minocycline. It shows resistance to most of the antibiotics used against E. meningoseptica. Methods: All patients who tested culture positive for Elizabethkingia meningoseptica during their Critical illness in our ICU were included in the study. Out of 28 isolates, 16 (57.94%) were from blood, 9 (32.14%) from respiratory samples, and 3 (10.73%) from CSF. The mean age was 64.4 years. There were 19 (67.86%) male and 9 female (32.14%) patients. The mean length of hospitalization was 29 days. The most common underlying condition was type 2 diabetes mellitus (46.43%) followed by chronic lung disease (28.57%), chronic kidney disease (25%), and malignancy (21.42%). The cause of admission was pneumonia in 6 patients, malignancy in 6 patients, renal disease in 5 patients, recent surgery and GI sepsis in 3 patients, urosepsis in 4 patients, skin and soft tissue infection in 3 patients, and cardiac disease in 1 patient. None had E. Kingia as primary culture positive during ICU admission. About 11 (39.38%) Patients were having a central line at the time of infection. Polymicrobial infection was seen in 11 patients (39.28%). The most common pathogens concurrently found were Klebsiella pneumonia in 4 patients, Enterococcus faecalis in 1 patient, Escherichia coli in 2 patients, Acinetobacter baumannii in 2 patients, and Pseudomonas aeruginosa in 1 patient. Out of 28 patients, 12 succumbed to the illness. So all cause mortality was 42.85%. The cause of death cannot be ascertained to Elizabethkingia meningoseptica alone as 7 out of 12 had a polymicrobial infection. From the cultures, 6 isolated strains (21.43%) were sensitive to FQs, 11 strains (39.23%) were sensitive to TMP-SMX, 22 strains (78.57%) were sensitive to Minocycline and 21 (75%) were sensitive to piperacillin-tazobactam. Vancomycin and rifampicin sensitivity was 28.57% and 46.42% respectively. Discussion: Infection with Elizabethkingia spp. is an uncommon phenomenon; however, they are clinically significant because the pathogen shows intrinsic resistance to a wide range of antibiotics used routinely in hospital settings to treat Gram-negative pathogens. A variety of cases have been reported with Elizabethkingia spp. and these include pneumonia, meningitis, catheter-related bloodstream infections, biliary sepsis, osteomyelitis and keratitis. Elizabethkingia meningoseptica is said to survive in chlorine-treated municipal water supplies, so it often colonizes sink basins and taps inside hospital settings. These act as reservoirs inside hospital environments and colonize the patients via contaminated medical devices involving fluids, such as respirators, intubation tubes, mist tents, and humidifiers. Infections due to Elizabethkingia species are on the rise in different parts of the world. This is indicated by a recent report from Taiwan that reported a number of cases of E. meningoseptica. Our study also reported a significant number of patients with infections caused by both E. meningoseptica. Elizabethkingia was isolated from a total of 28 individuals. Our study showed a strong preference for extremes of age as the average age of the adult patients was
Elizabethkingia is emerging as an important cause of nosocomially acquired bacteremia/infections with GNBs. 42.85% of patients. High mortality in this study was due to pre-existing co-morbidities, have led to increasing numbers of risk factors, including indwelling catheters, venous line insertion, as an important cause of nosocomially acquired bacteremia/infections with GNBs.

In a study by Venkatesh et al., which recorded Pseudomonas aeruginosa, Klebsiella pneumoniae, Acinetobacter baumannii, and Proteus mirabilis as common species. The average duration of hospital stay in our study was 29 days. Our findings were consistent with other similar studies by Lin et al., where the mean duration of hospital stay was 32 days, and by Moore et al., where the mean duration of hospital stay was 17 days (range 4–35 days). Elizabethkingia is a sturdy pathogen showing resistance to a wide variety of drugs, including most of the β-lactam antibiotics including carbapenems and aztreonam, the aminoglycoside group of drugs, and chloramphenicol. A previous literature search indicates the susceptibility of Elizabethkingia to aminoglycoside group of drugs, and chloramphenicol. A previous literature search indicates the susceptibility of Elizabethkingia to cotrimoxazole, fluoroquinolones, minocycline, ticarcillin-clavulanate, piperacillin, and piperacillin-tazobactam. This widespread resistance to a variety of β-lactams is due to its production of metallo-β-lactamases coded by BlaB and Bla (GOB) genes, conferring the ability to degrade most of the β-lactam antibiotics. Minocycline and piperacillin-tazobactam proved to be the most effective drugs in our study, showing 78.57 and 75% sensitivity. Many past reports have also studied minocycline and piperacillin as 100% effective in Elizabethkingia infection. Mortality due to Elizabethkingia infections ranges from 21% to 52% as described in previous studies. In a study by Venkatesh et al., the mortality was 30.8%, and 69.2% of the patients recovered from their infection. Another study, by Lin et al., estimated the mortality rate to be around 41%. In this Study Mortality was 42.85% of patients. High mortality in this study was due to more sick patients, central line-related blood stream infections, prolonged mechanical ventilator support, and polymicrobial infections with GNBs. Conclusion: Elizabethkingia is emerging as an important cause of nosocomially acquired bacteremia/sepsis and meningitis in developing countries like India. Multiple risk factors, including indwelling catheters, venous line insertion, irradiation and prolonged use of broad-spectrum antibiotics, and pre-existing co-morbidities, have led to increasing numbers of cases. Microbiologists as well as clinicians have to play an active and enthusiastic role in the timely identification and treatment of this multidrug-resistant pathogen. Few studies and isolated case reports have been published on infections caused by this organism. Hence, the current study is an effort to study and assess the clinical as well as demographic profiles of patients with infections caused by various Elizabethkingia isolates. Detailed studies and research work are required to understand the pathogenesis of this opportunistic pathogen as well as its impact in healthcare settings.

References


Neuroleptic Malignant Syndrome - A Case Series

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Introduction: Neuroleptic malignant syndrome (NMS) is a life-threatening neurologic emergency associated with the use of neuroleptic agents and characterized by a distinctive clinical syndrome of mental status change, rigidity, fever, and dysautonomia. Most of the current guidelines are supported by clinical experience and case reports of patients treated for NMS due to the rarity of NMS presentation. Objectives: The goal of this case series is to increase awareness of NMS among emergency physicians about NMS presentation and treatment options.

Material and methods: We present 3 cases presenting with NMS in different clinical scenarios. Results: Case 1: A 65-year-old male patient with a known case of Parkinson's disease and on treatment came to the emergency department with complaints of fever, cough, and altered sensorium for since 5 days. On further inquiry, relatives revealed a stoppage of drugs since current respiratory symptoms started due to poor oral intake. Examination revealed altered sensorium, rigidity, temperature 104°F, tachycardia, and tachypnea. X-ray showed mid-zone haziness. CT brain normal. CSF studies are normal. CPK levels raised to 1092 U/L. The patient was treated with bromocriptine, supportive care, and antibiotics. Syndopa was reintroduced. Case 2: A 35-year-old male admitted with a neuroparalytic snake bite. The patient needed ventilatory support. Midazolam was used for sedation. The patient developed benzodiazepine-induced psychosis, for which haloperidol was started. Psychosis decreased but the patient started having high-grade fever 3rd day onwards. Examination showed a temperature of 100.3°F, blood pressure of 146/97 mm Hg, tachycardia, and tachypnea present. CPK levels significantly raised to 1823 U/L. The patient was treated with bromocriptine, supportive care, and antibiotics. Syndopa was reintroduced. Case 3: A 20-year-old female diagnosed case of systemic lupus erythematosus was started with steroid pulse therapy for lupus nephritis. The patient started having altered behavior and restlessness on 4th day. The psychotic episode was suspected to be due to steroid-induced as it was started after high-dose steroid therapy. CNS infection was ruled out with normal CSF studies. Haloperidol was initiated. Psychosis symptoms decreased but the patient started having high-grade fever, greater than 38°C patient demonstrated muscular rigidity along with tachycardia, and tachypnea. CPK levels came out to be 1480 U/L. The patient discontinued dopamine antagonist therapy. The patient was managed with bromocriptine, supportive care, and cyclophosphamide for lupus nephritis. Discussion and Conclusion: In our case series, patients presented with frequently reported NMS symptoms, hyperthermia, and rigidity, 1st case was with the sudden withdrawal of dopamine agonist drug, and the other two cases with the use of 1st generation neuroleptic drug haloperidol. All our patients had moderately elevated CPK levels of more than 1000 U/L, while severe NMS can cause values as high as 10,000 U/L. The 2nd case had derangement in renal function as well. Our cases didn’t have significant electrolyte imbalances or cardiac arrhythmia which shall be monitored strictly during ICU stay. Therapeutic approaches tend to vary. The first week is important when you start a neuroleptic drug, particularly in critical illnesses. Early suspicion and doing CPK levels along with clinical scenario is important in the management of NMS. Our case series provides emergency physicians with critical examples of NMS presentation and the potential benefit of using bromocriptine for NMS.

References


Impact of Antibiotic Stewardship on Antibiogram

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Objectives: Antibiotic resistance and the occurrence of multidrug-resistant organisms (MDROs) is a leading problem throughout the world. There is a correlation between increased antibiotic consumption and the emergence of MDROs. In our study, we attempted to see whether decreasing antibiotic consumption has any effect on the pattern of antibiotic sensitivity in the domain of similar clinical outcomes. Materials and methods: This is a retrospective study comparing the antibiotic consumption and resistance patterns in the respective study periods from January 2021 to June 2021 and January 2022 – June 2022. Antibiotics were classified according to the WHO Aware Watch and Reserve (AraWe) protocol. Antibiotic consumption was estimated as defined units per 100 patient days. This was estimated from the hospital database by calculating the consumption and occupancy in the respective periods. Antibiograms in the respective study periods were also obtained from the database and they were compared. The clinical outcome parameter monitored was Standardized Mortality Rates (SMR) in the respective study periods. Results: In our study, we found that among the AWARE antibiotics, AMOXICILLIN-CLAVULANATE was used more frequently in 2022 than in 2021. The
difference in consumption was 1.26 units/100 patient days. Among the WATCH antibiotics, CEFTRIAXONE and CEFTAXIME were used more frequently in 2022. BL-BLIs and CARBAPENEMS were used in significantly lesser quantities in 2022 with the highest difference in consumption being for MEROPENEM—11.98 UN1TS/100 patient days. Among the BL-BLIs a difference in consumption of 8.44 units/100 patient-days was noted for PIPERACILLIN-TAZOBACTAM. There was a very modest increase in consumption of Fluoroquinolones in 2022 (less than one per 100 patient days). Among the RESERVE antibiotics only MINOCYCLINE was used more frequently in 2022 the difference in consumption for 100 patient days being 0.244. The highest difference in consumption was noted for POLYMIXYIN E-3.12/100 patient days. The findings in the antibiograms revealed that for isolates of the Urinary Tract, there was a 10%–13% increase in Nitrofurantoin and Amoxicillin-clavulane sensitivity among E.coli (major pathogen). The susceptibility of E.coli to Carbapenems and Piperacillin-Tazobactam increased up to 29% and 30% respectively. There was increased susceptibility to Fluoroquinolones as well (by 18% for E.coli and 24% for Klebsiella). Among the respiratory tract isolates, there was a 29% increased susceptibility to Amikacin for Acinetobacter and a 17% increased susceptibility to Cotrimoxazole in Klebsiella. Acinetobacter exhibited 11% increased susceptibility to Fluoroquinolones and 13% increased susceptibility to Piperacillin- Tazobactam and Carbapenems. For Klebsiella and Pseudomonas susceptibility to Piperacillin-Tazobactam was increased to 8% and 19% respectively and for Carbapenems, they were 10% and 17% respectively. Klebsiella also showed increased susceptibility to Tigecycline by 34%. However, Minocycline susceptibility decreased by 3% and Tigecycline susceptibility decreased by 15% for Acinetobacter isolates. Overall susceptibility of the isolates across all antibiotic groups particularly the Watch antibiotic group showed a consistently increasing trend for all urinary, respiratory, and blood specimens. Conclusion: Decreasing antibiotic consumption defined as units per 100 patient days correlated with increased susceptibility across most of the groups of antibiotics of clinical interest. This was not associated with any adverse clinical outcome as monitored by SMR.

Acute Axonal Motor Polynueropathy: A Rare Manifestation of Pyrethroid Poisoning

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Background: Pyrethroids account for around fourth of the insecticide market in industrial countries. They are widely used for insect control in agricultural fields. Its high selectivity for insects and rapid metabolism to the nontoxic metabolites makes it poison with low toxicity in humans. Given its widespread use as an insecticide, it is important to understand its toxicity in humans. Case Report: A 22-year-old male was referred from the Community Health Centre given further management of unknown substance poisoning. The patient presented with a history of consumption of approximately 300 mL of Pyrethroid compound i.e., Cyathrin followed by vomiting and diarrhea after 2 hours followed by 2 episodes of GTCS type of seizures which were of 5–7 minutes of duration and unconsciousness. On clinical examination patient GCS was E1V1M1 and was in an aspired state with widespread muscle fascinations. Immediately patient was intubated and transferred to the intensive care unit for further treatment. Further investigations revealed raised WBC counts with MODS. Gastric lavage was not performed due to the large consumption of poison as the patient had a risk of aspiration pneumonia. As per medical data available till now there is no antidote available for pyrethroid poisoning and hence he was given intensive and supportive care. After 7 days of admission, the patient developed Acute onset Quadriplegia in which clinical examination revealed normal deep tendon reflexes with mute planters. A Neurologist’s opinion was taken and was advised with CSF study, CEMRI Brain and CEMRI Spine which were within normal limits. A Nerve Conduction Study was done which revealed reduced CMAP and absent F-waves in all four limbs with normal latency and velocity with normal sensory nerve conduction which was suggestive of Motor Axonal Polynueropathy. The patient was started with pulse steroid therapy followed by oral steroids to which he responded poorly and improved very less. Discussion: This is a very rare case report on Pyrethroid induced Acute Motor Polyneuropathy which mandates further research on Pyrethroid induced poisoning and also a requirement to alter the biochemical properties of Pyrethroids to make them more selective and less harmful for humans. Also, it is a need of the hour to find the antidotes of commonly used insecticides to avoid dreadful complications. Conclusion: Pyrethroid poisoning is common in clinical practice. Consumption in large amounts, the patient may manifest life-threatening complications that require intensive care management. Treatment is supportive and symptomatic. Though outcomes are favorable in most cases patients can land up in dreadful complications leading to a prolonged hospital stay and even to mortality.

References


Antibiotic Utilization and Resistance Pattern in Patients with Acute Respiratory Distress Syndrome

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Introduction: Antibiotics hold an important role in critical care settings, especially in patients with acute respiratory distress syndrome (ARDS). The rational use of antibiotics needs to be monitored properly. Objective: This study aimed to assess the antibiotic utilization pattern and antibiotic resistance pattern in patients with ARDS. Materials and methods: This was a retrospective observational study among ARDS patients in a tertiary care hospital. The patient-related clinical data were collected from the medical record department and the antibiotic resistance pattern
were collected from the laboratory. The use of antibiotics was descriptively analyzed and correlated against the clinical outcomes using the Chi-square test. **Results:** A total of 861 patients (503 male and 358 female) with an average age of 46.93 ± 15.80 were included in the study. 57.8% (n = 498) and 24.4% (n = 210) patients were receiving 6–10 drugs and 11–15 drugs, respectively with an average of 8.1 ± 3.5 drugs per hospital stay. 38.7% (n = 333) and 26.7% (n = 230) patients received 2 and 3 antibiotics respectively with an average of 2.2 ± 1.2 antibiotics per hospital stay. 63.3% (n = 545) of patients received one fixed dose combination (FDC) and 28.5% (n = 245) didn't receive any FDC with an average FDC of 0.8 ± 0.6 per patient. Age, the total number of drugs, gender, use of antibiotics, and the number of antibiotics significantly (p < 0.05) affect the recovery. A total of 369 patients had the resistance data and Acinetobacter (n = 99; 26.8%) was the major microorganism, followed by Klebsiella species (n = 83; 22.5%). The major portion (74%; n = 273) of patients were resistant to ciprofloxacin, followed by ceftipime/cefepime (59.1%; n = 218). **Discussions:** Age, the total number of drugs, gender, use of antibiotics, and the number of antibiotics significantly affect the recovery. Ciprofloxacin was the most resistant antibiotic among the patients. The critical healthcare professional should practice rational prescribing and rational drug use, especially in the case of antibiotics to avoid raising concerns of antibiotic resistance and to have better patient outcomes. **Funding:** No funding is received for this study.

**References**

**Study of Positioning in Intensive Care Unit**

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**Aims and Objectives:**

**Primary objective:** To assess the adherence to positioning practices as per guidelines (turning bed 2 hours) in order to prevent hospital-acquired pressure ulcers in indicated patients. **Secondary objective:** To assess improvement after implementing the “turning clock”.

**Materials and methods:** An observational study was conducted in the ICU of our hospital in 2 phases from the period of August to November 2022 consisting of 40 patients in each phase. For phase 1 a specialized team was formed consisting of doctors and nurses who acted as silent observers in the ICU. Patients were observed for position change-propped up, right lateral, left lateral at an interval of 2 hours by the specialized team. The data recorded was kept confidential from other members of the ICU. In phase 2 of the study from the time period of October to November 2022, an intense training session was held for both doctors and nurses for a week and a “turning clock” was designed and placed at the foot end of the patient, to guide change of positioning in the ICU which indicated the time of the day and the position at which the patient need to be placed. **Results:** In phase 1 of the study from the period of August to October 2022, none of the patients were mobilized at an interval of 2 hours. 62.5% of 40 patients during this phase were not mobilized for 10–14 hours, 25% of patients were not mobilized for 14–24 hours and 2.5% of patients were not at all mobilized at all in a day. The lacunae identified were inadequate staff to patient ratio, inadequate training of nurses related to technique and timing of positioning. After implementation of the turning clock the silent observation was done again. Significant improvement in the positioning practice was noted. About 80% of patients were mobilized at an interval of 2 hours which was a significant improvement. **Conclusion:** Though positioning patients at an interval of 2 hours is accepted as a standard for prevention of pressure ulcer, it is a goal that remains elusive in ICU due to busy schedules and inadequate training and awareness of staffs for mobilizing patients. Hence, the “turning clock” is found to be effective for increasing the turning rates of patients and thus prevent pressure ulcers in ICU.

**References**
3. From the John A. Burns School of Medicine (UW) and the Departments of Medicine and Surgery (UW) (no date) Body positioning of intensive care patients: Clinical... : Critical care medicine, LWW. Available at: https://journals.lww.com/ccmjournal/Abstract/2002/11000/
Successful Use of FloTrac™ Continuous Cardiac Output (CCO) Monitoring in the Resuscitation of a Brain Dead Potential Organ Donor

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Background: While the early management of a post-transplant organ recipient is crucial to ensure adequate graft function and integrity, equally important is the management of the organ donor prior to transplant. As normal physiology is preserved in a living donor, the same is not the case with patients donating after neurological determination of death (NDND). This is also the reason for graft failure in up to 25 percent of transplants post-DNDD. The initial catecholamine surge causing tachycardia, hypertension, and stress-induced cardiomyopathy followed by rapid catecholamine depletion, sympatholytic, and generalized vasoplasia cause wide hemodynamic fluctuations in the brain-dead organ donor. These changes may not be avoidable but can certainly be mitigated using the right intervention at the right time. Continuous cardiac output (CCO) monitoring devices help by providing a real-time assessment of the cardiac output, systemic and pulmonary vascular resistance, stroke volume variation, and various other parameters that aid in crucial decision-making. We made use of the Vigileo FloTracTM when presented with a diagnostic dilemma in a brain-dead organ donor in shock. Case Report: A 32-year-old female patient was received in the trauma bay with a history of a roadside accident with a head injury four days before the day of the presentation. There was a history of multiple local hospital visits before being referred to our center. NCCT Head showed right frontotemporoparietal contusion with gross cerebral edema with midline shift. Her receiving status was intubated on invasive positive pressure ventilation via Ambu. Her Glasgow Coma Score was E1VTMT1, with the right pupil dilated and nonreactive to light, and the left pupil not assessed due to orbital blowout with optic nerve entrapment. Baseline vitals were heart rate of 124/minute, blood pressure of 70/40 mm Hg in the right upper arm, SPO2 94 percent on FiO2 of 1.0. The family was explained about her dismal prognosis and provided the option of organ donation, to which they agreed. The patient was shifted to the trauma intensive care unit (TICU). On arrival, her heart rate was 135 beats/minute, blood pressure of 70/44 mm Hg, and SPO2 of 95 percent on FiO2 0.8. The patient had an initial urine output of 0.3–0.5 mL/kg/hour. She was started on Injection Norepinephrine at titrated doses and an initial fluid bolus of 30 mm of Sterofundin per kg body weight was administered. However, the patient did not show improvement in pressure and gradually required epinephrine and vasopressin in incremental titrations. A baseline 2D ECHO showed poor cardiac contractility with an ejection fraction of 30–35% with dilated ventricles suggestive of cardiogenic shock. However, the patient did not show improvement with indicators or fluid restriction, which posed a diagnostic dilemma. The patient also showed wide fluctuations in arterial blood pressure reading, ranging from 80/50 mm Hg to 180/70 mm Hg at the same inotropic and vasopressor dosing. To overcome these issues, a FloTracTM was attached to the arterial and central venous cannula and continuous cardiac output monitoring was done. The initial reading showed a cardiac output of 2.6 L/min, SVRI of 1900 dyne/cm², and a high SVR with a stroke volume variation of 6 percent. Her central venous pressure was 9 mm Hg. These features were suggestive of septic as well as cardiogenic shock. The patient was started on methylprednisolone at 1mg/kg daily dose to overcome hypocortisolism and autonomic instability. The empirical antibiotic cover was hiked while culture reports were awaited. Fluid resuscitation was aimed at keeping stroke volume variation within the plateau of 4–12%. Dobutamine infusion was started and gradually tapered off once cardiac contractility was restored. Over the next three days, the patient showed improvement in hemodynamics and required only a norepinephrine low-dose infusion. Cardiac output improved to 4.9 L/min, SVRI to 1700 dyne/cm², and central venous pressure remained between 8 and 10 mm Hg. 2D ECHO showed an ejection fraction of 50–55%. There was an improvement in the urine output, renal function tests, and total leukocyte counts as well, as the sepsis improved. Conclusion: Static pressure-based indices like central venous or pulmonary capillary wedge pressures are not adequate to show real-time fluid status in a patient Rollins KE. Of the available dynamic indices like transesophageal Doppler or transesophageal ECHO, FloTrac is the least cumbersome and operator friendly with a short understanding or learning curve. At the same time, it provides one with at least ten cardiovascular parameters, similar to a pulmonary artery catheter, but with a better safety profile. Studies have shown that dynamic hemodynamic monitoring is associated with better recovery profiles and shorter hospital stay Cannesson M. Adopting GDFT in the donor has been shown to reduce acute tubular necrosis in the postoperative period in recipients. However, there are a few limitations to the use of FloTrac for continuous cardiac output monitoring. Firstly, FloTrac shows a reduction in the reliability of SVV measurement by up to 13% in a spontaneously breathing patient. Also, it has not been proven superior to the PA catheter when it comes to measuring pulmonary capillary wedge pressure or markers of pulmonary arterial hypertension. Nevertheless, owing to its short learning curve, ease to use, and limited need for calibration, FloTrac can be considered a useful adjunct in the preoperative management of a potential organ donor.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Day 1 - ICU</th>
<th>Day 2 - ICU</th>
<th>Day 3 - ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac output</td>
<td>2.2–2.9 L/min</td>
<td>3.8–4.2 L/min</td>
<td>6.2–6.8 L/min</td>
</tr>
<tr>
<td>Central venous pressure</td>
<td>3 mm Hg</td>
<td>7 mm Hg</td>
<td>10 mm Hg</td>
</tr>
<tr>
<td>Serum Urea (mmol/l)</td>
<td>134</td>
<td>98</td>
<td>66</td>
</tr>
<tr>
<td>SGOT</td>
<td>552</td>
<td>248</td>
<td>89</td>
</tr>
<tr>
<td>SGPT</td>
<td>437</td>
<td>169</td>
<td>72</td>
</tr>
<tr>
<td>Total leucocyte count</td>
<td>19600</td>
<td>14200</td>
<td>9900</td>
</tr>
</tbody>
</table>

Background: American Heart Association (AHA) in 2020 new recommendation for ECPR for the reversible cause of death 5T AND 5H for sudden cardiac arrest treatment in our hospital we are doing ECPR for the last 21 years with good result. Aim: To describe trend in survival in our patient who received ECPR for cardiac arrest. Method: Our cardiac team is having experience of 21 years of ECPR for the reversible cause of death if the patient does not respond to CPR. For ECPR we do median sternotomy and we use an aortic cannula.
for the arterial source and a venous cannula in the right atrium for the venous source after 4mg/kg/bw heparin iv dose and act 480sec in our unit we have done 6250 case on CPB (Cardiopulmonary Bypass) AND 650 case on ECPR. We lost two cases and 3 cases of stroke they recovered in 15 days. About 3 cases got renal failure to manage with medical management no cases of sepsis or bleeding or other complication were reported in our unit. **Result:** There are 650 cases we have done on ECPR with 1 case mortality and 3 cases renal failure 3 case stroke and no other complication of CPB reported in our unit. **Interpretation:** In our unit, we have done 6250 cases on CPB out of which we lost 30 cases post-operative in this year’s follow-up record. In our ECPR 650 case, we lost only 1 case with the increased use of ECPR. Our team has started with 15 minutes for ECPR time in the first few cases. The team knows that they can put the patient on ECPR in 3 minutes in our unit for the reversible cause of death. In our team, we are having 2 cardiac surgeons, 1 medical officer, 3 cardiac anesthesiologists, 2 perfusion experts, 7 staff sisters, and 2 OT technicians. **Keywords:** Cardiopulmonary Resuscitation (cpr), Extracorporeal Circulation and Membrane Oxygenator (ECMO), ECMO and VV ECMO, Reversible cause of death St 5h, Veno Arterial (VA).

**Reference**

**Difficult Airway Management, A Case Study on Retrograde Intubation**

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DOI: 10.5005/jp-journals-10071-24411.141

**Introduction:** Retrograde intubation is one of the useful techniques in managing difficult airways. However, with the advancement in the newer availability of intubation techniques such as fiberoptic bronchoscopy and video laryngoscopy, retrograde intubation has taken back seat. Mismanagement of Difficult airway leads to 30% of intubation related mortality. According to ASA difficult airway algorithm, awake intubation is safer measure to secure airway. Awake fiberoptic intubation is the best available method to secure airway, but retrograde intubation is also an acceptable alternative method where fiberoptic bronchoscopes are not available.

**Material and methods:** We are reporting an operated case of a 62-year male with a known case of carcinoma left maxilla, post subtotal maxillectomy modified radical neck dissection and reconstruction with right tensor fascia flap and decannulated tracheostomy with raw Wound over neck posted for left deltopectoral flap cover. The patient was admitted to the ICU postoperatively.

**Results:** The surgery went on for 4.5 hours and was completely uneventful. The patient was hemodynamically stable intraoperatively and postoperatively. The patient was shifted to the ICU postoperatively.

**Conclusion:** Management of a difficult airway is a dreadful challenge for an Anaesthesiologist. Proper planning, rational decision, and use of various techniques will help an Anaesthesiologist to decrease mortality and morbidity in hospital setups. Awake fiberoptic intubation remains the best available intubation technique in difficult airway cases, however, retrograde intubation can be an acceptable alternative in cases where there is nonavailability of these modalities.

**Ultrasonographic Assessment of Peripheral Muscle Thickness and Its Relationship with ICU Acquired Weakness Among Intensive Care Unit Patients – A Prospective Observational Study**

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DOI: 10.5005/jp-journals-10071-24411.142

**Introduction:** Skeletal muscle dysfunction develops early and rapidly during critical illness. This dysfunction defined clinically as intensive care unit–acquired weakness is associated with prolonged mechanical ventilation, ICU stays, and increased hospital stays. Materials and method: The study was conducted in MMHRC in patients of intensive care units who are mechanically ventilated after getting approval from the institutional ethics committee with informed consent taken prior to the study. It was done on 77 patients from August 2021 to October 2022. Inclusion Criteria were patients aged more than 18 years, on mechanical ventilation for more than...
3 days. Exclusion Criteria were pregnancy, neuromuscular diseases, Anatomical deformity of limbs, recent hospitalization, duration of hospital stay less than 72 hours, BMI less than 18.5 or more than 40, and refusal to give consent. **Result:** ICUAW was more common among patients who got a decline in muscle thickness at a higher range than those with less variation. Moreover, ICUAW was more common in a non-survivor group than a survivor group. Discussion: ICUAW was more in the non-survivor group as compared to the survivor group and the rate of decline in muscle thickness from day 1 to day 3 was statistically significant. Nutrition plays a vital role and feeding should be initiated in all patients as early as possible.

**References**

**Scrub Typhus an Emerging Threat in Resource Limited Region of Uttar Pradesh**

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³Department of Gastroenterology, Hepatology, Therapeutic Endoscopist  
⁴Department of Pediatric, City Hospital, Gorakhpur, Uttar Pradesh, India  
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**DOI:** 10.5005/jp-journals-10071-24411.143

**Background:** Scrub typhus is a febrile illness caused by Orientia tsutsugamushi. There were outbreaks of acute febrile illness in the Gorakhpur region of Uttar Pradesh each spanning in rainy season mainly from June to October. There is a paucity of data on the etiology of this AFI outbreak, in which many cases were found to be of scrub typhus. The present study was conducted to find out the clinical features, complications, response to treatment, and outcome of patients suffering from scrub typhus in a tertiary health care center of Gorakhpur. **Methods:** This prospective study was performed at City Hospital (A Super-Specialty Hospital) Gorakhpur, which is a tertiary health care institute in the eastern part of Uttar Pradesh. The study period was of 7 months from Jun 2021 to Dec 2021. **Results:** 97 Patients were found to be suffering from scrub typhus. Of 97 patients, 45 (46.39%) were male and 52 were female. Most of the patients are in the age group of 30–50 years. The maximum case was seen in October and November Common clinical symptoms noticed were Fever in 95 (97.03%), Abdominal pain in 57 (58.76%), Vomiting in 59 (60.82%), Headache in 27 (27.83%), Dyspnea in 17 (17.52%). Common clinical signs noticed were Tachycardia in 69 (71.13%), Icterus in 45 (46.39%), Hypo tension in 34 (35.05%), Hepatomegaly in 29 (29.89%), Pleural effusion in 19 (19.58%). Mortality was seen in 4 (4.12%) patients.

**Conclusion:** Scrub typhus has emerged as an important cause of febrile illness in the Gorakhpur region in the rainy season. A high index of suspicion early diagnosis and prompt intervention may help in reducing mortality. Mortality in these patients is most often due to multi-organ dysfunction and delayed treatment due to the late presentation of symptoms and late diagnosis. Implication: There should be a rapid test for point-of-care diagnosis of scrub typhus and it should be included in the first line of the workup of acute febrile illness. **Keywords:** Gorakhpur, Orientia Tsutugamushi, Scrub typhus.
Protocol for Continuous Renal Replacement Therapy using Citrate (Regiocit, Citrate concentration 18mmol/L)

**Starting Parameters:**
- **EFFLUENT DOSE:** ALWAYS LESS THAN 35ml/kg/hr unless specifically mentioned (REDUCE DIALYSATE AND REPLACEMENT FLUID ACCORDINGLY)
- **FILTRATION FRACTION:** TARGET LESS THAN 25%
- **CITRATE DOSE:** 3 mmol/L
- **CALCULUM DILUTION:** 10 ml of 10% Calcium Chloride in 50ml Normal Saline
- **CALCULUM COMPENSATION:** It's by 10% Calcium Chloride depending on initial PATIENT IONIZED CALCIUM level – see table 1 below.

**Table 1: Initial Calcium Compensation**

<table>
<thead>
<tr>
<th>Patient ionized calcium</th>
<th>Starting Calcium compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.9 mmol/L</td>
<td>15ml/hr AND give 10ml of 10% Calcium chloride over 30 mins before starting</td>
</tr>
<tr>
<td>0.9 - 1.1 mmol/L</td>
<td>12.5 ml/h</td>
</tr>
<tr>
<td>Greater than 1.1 mmol/L</td>
<td>10ml/hr</td>
</tr>
</tbody>
</table>

**Treatment Monitoring**

Low patient ionized calcium values should ALWAYS be attended to as a priority as it will have the biggest impact on patient physiology and stability.

If at any time during treatment the patient's ionized calcium is less than 0.9 mmol/L, administer 10 ml of 10% calcium chloride through central line.

A patient ionized Ca of more than 0.9mmol/L is required to keep the patient safe from the effects of hypocalcemia. A filter ionized calcium concentration of 0.25-0.35 mmol/L is required to prevent filter clotting.

So, once treatment is initiated and blood flow established, wait 60 minutes then check the:
- **P简单IONIZED CALCIUM** from the patient's arterial line.
- FILTER IONIZED CALCIUM (from blue port on Prismaflex).

The table below gives the timings of the filter ionized calcium and patient ionized calcium checks (as well as other blood tests which will be needed).

**Table: Timing of Calcium Checks**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Initial check</th>
<th>And then</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter ionized Ca – ABG from blue port on circuit Target 0.25 to 0.35 mmol/L</td>
<td>2nd Hourly until stable (no further correction needed)</td>
<td>6 Hourly</td>
</tr>
<tr>
<td>Patient ionized Ca – ABG from arterial line Target 0.9 to 1.1 mmol/L</td>
<td>2nd Hourly until stable (no further correction needed)</td>
<td>6 Hourly</td>
</tr>
<tr>
<td>Serum Ca</td>
<td>After 6 hours</td>
<td>Daily</td>
</tr>
<tr>
<td>Total Calcium to patient Ca ratio Target ratio &lt;2.4 (Ca mmol/L = Ca (mg/dL) x 0.2495)</td>
<td>After 6 hours</td>
<td>Daily</td>
</tr>
</tbody>
</table>

Med/Apr 18/ICU/6023
Adjust the Calcium Compensation and Citrate Dose based on the table below. Adjustments are made through the Anticoag screen.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Filter Ionized Ca &gt;0.35</th>
<th>Filter Ionized Ca 0.25 – 0.35</th>
<th>Filter Ionized Ca &lt;0.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Ionized Ca &lt; 0.9</td>
<td>Citrate dose increased by 0.5mmol/L AND Calcium compensation increased by 2.5ml/hr</td>
<td>Calcium compensation increased by 2.5ml/hr</td>
<td>Citrate dose decreased by 0.5mmol/L AND Calcium compensation increased by 2.5ml/hr</td>
</tr>
<tr>
<td>Patient Ionized Ca 0.9 – 1.1</td>
<td>Citrate dose increased by 0.5mmol/L</td>
<td>‘Normal’ Ideal Values</td>
<td>Citrate dose decreased by 0.5mmol/L</td>
</tr>
<tr>
<td>Patient Ionized Ca &gt; 1.1</td>
<td>Citrate dose increased by 0.5mmol/L AND Calcium compensation decreased by 2.5ml/hr</td>
<td>Calcium compensation decreased by 2.5ml/hr</td>
<td>Citrate dose decreased by 0.5mmol/L AND Calcium compensation decreased by 2.5ml/hr</td>
</tr>
</tbody>
</table>

RECHECK 2nd HOURLY AFTER ANY CHANGE

If at any time during treatment the patient’s ionized calcium is less than 0.9 mmol/L, administer 10 ml of 10% calcium chloride.

Always target an effluent dose of less than 35mL/kg/hr and filtration fraction less than 25% (unless specifically indicated otherwise)

Total calcium to ionized calcium ratio monitoring

A high “total calcium to ionized calcium ratio” is a surrogate marker of citrate toxicity. To obtain the value, perform the following calculation manually – PATIENT TOTAL CALCIUM + PATIENT IONIZED CALCIUM. Note that it is the total calcium and not the “corrected calcium” that is used in the equation.

After 6 hours of treatment commencing, request a total calcium from the lab. However, increasing calcium compensation in the preceding hours could indicate citrate accumulation. In these circumstances, a total calcium level may be checked before the 6 hour mark.

\[
\text{Ca mmolL = Ca (mg/dl) x 0.2495}
\]

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2.4</td>
<td>Check ratio daily</td>
</tr>
<tr>
<td>&gt;2.4</td>
<td>Stop Citrate for 20 minutes and restart afterwards with 0.5mmol/L less than the previous citrate dose. Leave Calcium compensation unchanged. This would result in a slightly higher filter ionized calcium. (0.35 to 0.45 acceptable) If ratio remains above 2.4 despite filter ionized calcium of 0.35 – 0.45mmol/L then consider:</td>
</tr>
<tr>
<td></td>
<td>1. Doubling baseline dialysate flow (will increase citrate clearance)</td>
</tr>
<tr>
<td></td>
<td>2. Reducing blood pump speed (will reduce total administered citrate dose)</td>
</tr>
<tr>
<td></td>
<td>3. Stopping citrate and using an alternative anticoagulant (or no anticoagulant)</td>
</tr>
</tbody>
</table>

Med/Apr 18/ICU 6023
evidence of citrate toxicity. In patients with a ratio of more than 2.4, citrate was discontinued for thirty minutes and restarted at a lower dose (0.5mmol/L less than the previous prescription) and the ratio was repeated after 6 hours. Citrate was completely discontinued two consecutive ratios of more than 2.4. Result: Out of 52 patients, in 48 cases (92.30%) filter life was more than 24 hours, in 37 cases (71.2%) filter life was more than 36 hours and in 15 cases (28.8%) filter life was more than 72 hours. Clotting of the filter was noticed in 30 patients (57.6%) out of which in 22 filters (73.3%) clotting was seen after 36 hours. Citrate accumulation was found in 27 cases (51.9%) which was resolved by discontinuing citrate for thirty minutes and restarting as per the protocol. Thus, none of the patients in our study had citrate toxicity. Citrate accumulation was higher in patients with higher lactates. Conclusion: Protocolized use of regional citrate anticoagulation leads to diligent use of CRRT along with prolonged filter life.

Ultrasound Assessment of Diaphragm Function in Traumatic Brain Injury: A Prospective Observational Study

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DOI: 10.5005/jp-journals-10071-24411.145

Objective: Patients suffering from severe traumatic brain injury (TBI) often require prolonged mechanical ventilation. The prolonged duration of mechanical ventilation is often associated with weaning failure in up to 38% of severe TBI patients. Ultrasound (USG) has emerged as a non-invasive modality to evaluate the diaphragm function. On USG assessment diaphragm thickness is observed to decrease over time in mechanically ventilated patients. The present study was conducted with the aim to observe changes occurring in diaphragmatic function over a time period in TBI patients receiving invasive mechanical ventilation.

Methods: Patients aged 18–65 years and suffering from TBI in whom mechanical ventilation was initiated within the last 24 hours were included and patients with a spine injury, pre-existing neuromuscular disorders, history of major thoracic and abdominal trauma or surgery, and pregnant patients were excluded from the study. USG assessment of diaphragm function was done on days 1, 3, 5, and 7 of NICU admission in the supine position, during sedation holiday, and while the patients were given a spontaneous breathing trial. About 7–13 MHz linear array transducer probe was placed at the 8th or 9th intercostal space on the anterior axillary line and the zone of apposition was identified. Diaphragm thickness was then measured from the center of the pleural line to the center of the peritoneal line. Measurements were done at end-expiration (TE) and at maximal inspiration (TI) for 3 consecutive times and then averaged. The thickness fraction was calculated as (TI - TE/TE) × 100. Diaphragm excursion (DE) was measured in M-mode using a 1–5 MHz phased array ultrasound transducer. Statistical analysis was done using SPSS 22.0. Student t-test (two tailed, independent) was used to find significance of study parameters. Chi-square/Fisher Exact test was used to find significance of study parameters. Pearson correlation between study variables was performed to find degree of relationship. p-value of < 0.05 was considered significant.

Results: There are 40 patients with a mean age of 35.2 ± 12.9 years were evaluated. About 33 suffered from severe, 6 from moderate, and 1 from mild TBI. Mean DTF at days 0, 3, 5, and 7 was 33.58 ± 10.08, 33.4 ± 9.76, 32.32 ± 8.36, and 31.65 ± 8.23 respectively. Changes in DTF were statistically significant on day 7 (p = 0.040). A significant difference was observed in DTF at day 5 in comparison to day 0 (p = 0.008) in patients who were weaned within 7 days. Mean DE at days 0, 3, 5, and 7 was 9.61 ± 3.99, 9.02 ± 3.46, 8.87 ± 2.63, 8.56 ± 2.74 respectively. Changes in DE over days 3, 5, and 7 were statistically significant (p = < 0.001). Mean DTF was lower on Day 3 in patients who were admitted for less than 20 days than those who required hospital admission beyond 20 days (p = 0.044). Conclusion: A decrease in DTF and DE over 7 days was observed with a significant decrease occurring on the seventh day following TBI. However, a significant correlation between DTF or DE with the duration of hospital stay as well as days of weaning could not be established.

A Comparative Study to Assess Effect of Discontinuation of Proton Pump Inhibitors (PPIs) After 48 Hours on Admission in Critical Care Unit on Incidents of Nosocomial Pneumonia

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DOI: 10.5005/jp-journals-10071-24411.146

Aim and Background: This study aimed to determine whether the use of gastric acid-suppressive agents increases the risk of nosocomial pneumonia (NP) in the critical care unit population.

Methods: The methodology adopted for experimenting with the effectiveness of the use of proton pump inhibitors in 2 study groups and evaluated the result with the help of APACHE II and CPIS calculator. The researcher performed an experimental study with a non-probability purposive sampling technique in a multi-critical care unit that included 60 critically ill patients from January 2021 to October 2021 at Krishna Hospital, Karad. The researcher divided patients into 2 groups after initiation of enteral feeding on a random basis, 1 group of patients with PPI and another group without PPI. Both of the groups were evaluated the risk of suspected HAI with the guidance of medical classification tools, APACHE-II, GCS, and CPIS at the time of admission and followed by consequent times irrespective of their diagnosis and treatment.

Results: Overall, out of 60 patients included, which were further divided into two groups for further evaluation, Pre-operative ICU mortality for patients from the PPI group (11.13) was lower than patients from the no PPI group (12.77). Mean Post-operative ICU mortality for patients from the PPI group (5.43) was lower than patients from the no PPI group (6.77). The mean APACHE II score for patients from the PPI group (7.83) was lower than for patients from the no PPI group (9.13). Clinical Pulmonary Infection Score (CPIS) I score for patients from the proton pump inhibitor (PPI) group (1.83) was lower than patients from the no PPI group (2.13). Clinical Pulmonary Infection Score II score for patients from the PPI group (2.23) was higher than patients from the no PPI group (1.90). CPIS III score for patients from the PPI group (2.20) was higher than patients from the no PPI group (1.90). From the above findings, an unpaired t-test was done to compare patients with Proton Pump Inhibitors (PPI) till discharge and the study group stopping Proton Pump Inhibitors (PPI) after 48 hours. There was no significant difference between the two groups for any of the scores (p > 0.05) indicating very few cases of nosocomial pneumonia in Krishna hospital, Karad. Conclusion: In short, prior use of a PPI did not correlate with a significant increase in the risk of developing Nosocomial Pneumonia (NP). Apart from PPI, there are a plethora
of treatments, and nursing care received by critical care patients with various physical illnesses and symptoms. It is also important to treat different pre-disposing and existing clinical conditions because those factors affect the functional outcome of the patient. Further studies are required for more clarification related to correlating the effect of PPIs and early detection of HAI. For this, a standard group selection is suggested on matching diagnoses with similar hemodynamic status. Keywords: Acute physiology, Chronic health evaluation score, Clinical pulmonary infection score, Hospital-acquired infection, Nosocomial pneumonia, Proton pump inhibitor.

The Better Predictor of Acute Kidney Injury Fractional Excretion of Sodium vs Fractional Excretion of Urea

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DOI: 10.5005/jp-journals-10071-24411.147

**Objective:** Acute kidney injury (AKI) is the sudden impairment of kidney function, resulting in theretention of urea and other nitrogenous waste products normally cleared by the kidney. Main objective of the present study is to compare the fractional excretion of urea (FEUrea) and fractional excretion of sodium (FENa) in differential diagnosis of AKI. **Material and method: Sources of data:** We selected participants for the present study, these consecutive randomly admitted patients in the department of medicine.

**Research design:** Clinical observation and experimental design were done for the present study. **Statistical analysis:** Data were treated for study, and the logistic regression, curve, and descriptive analyses were done with the help of SPSS 16. **Results:** Finding of the present study: Fractional excretion of sodium (FENa) ROC curve (0.957), standard error (0.039), 95% confidence interval (0.835–0.995) and the level of significant in p-value (0.5) is 0.0001. Fractional excretion of urea: In FEUrea ROC curve is 0.976, the standard error is (0.028), the 95% confidence interval is (0.865 to 0.995) and the level of significance in p-value (0.5) is 0.0001. The finding of result concluded that the FEUrea showed higher sensitivity and specificity in differentiating prerenal from intrinsic AKI in patients irrespective of diuretic exposure. **Conflict of interest:** The authors are declaring that no any conflict of interest.

Do Inflammatory Markers Prognosticate Outcomes in Polytrauma Patients? – Prospective Study

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DOI: 10.5005/jp-journals-10071-24411.148

A variety of inflammatory markers are released in response to tissue injury, after surgery, or an inflammatory stimulus, to act locally and systemically to generate a variety of physiological responses. The magnitude of their elevation correlates with the extent of tissue trauma or injury severity. IL6 and CRP are some of the readily measurable inflammatory markers. Elevations of these markers tend to correlate with adverse outcomes. **Aim:** To assess the predictive role of inflammatory markers in predicting the morbidity and mortality of polytrauma patients. To understand the relation between inflammatory markers IL-6, CRP; and increased length of stay in the hospital, number of days of mechanical ventilation, and incidence of mortality in polytrauma patients.

**Materials and methods:**
- A prospective study was conducted with 50 patients in the intensive care unit at Ganga Medical Centre, Coimbatore, Tamil Nadu, India. They were evaluated with detailed history, examination, and by reviewing relevant investigations. The inflammatory markers - IL6 and D-dimer were prospectively collected on days 1, 2, 3, 5, and 7 post-injury and studied. The patients were monitored during their stay in the hospital for mortality.
- Number of days of mechanical ventilation
- Length of hospital stay

**Results:** Data from the 50 patients were analyzed. The trend of serial IL-6 and CRP values were studied with the mortality outcomes. The day 2 IL-6 value had a significance in predicting mortality (value 309, AUC 82.9%, Sensitivity 80%, specificity 72%); day 3 (value 180, AUC 90.7%, Specificity 80%, Sensitivity 74%); day 5 (value 105, AUC 89.3%, sensitivity 80%, Specificity 80%); day 7 (value 134, AUC 80.4%, sensitivity 80%, specificity 72%). A late rise in the IL 6 values after day 5 was associated with increased mortality. The IL-6 values were studied with the length of stay in the ICU by multiple regression analysis, and showed a significant correlation (p-value 0.007, r² 0.29); with day 7 IL-6 values correlating with an increased stay in the ICU (p-value 0.017, r=2.48, Beta.003). The IL-6 values were studied with the length of stay in the hospital by multiple regression analysis, and showed significant correlation (p-value 0.010, r² 0.283) with day 2 IL-6 values correlating with an increased stay in the hospital (p-value 0.015, t-value 2.54, Beta .003). The CRP values and mortality were studied, showing day 5 (AUC 80.9%, value 147, sensitivity 80%, specificity 72%) and day 7 values (AUC 82%, value 194, sensitivity 80%, specificity 72%) associated with higher mortality. There was no correlation between the IL-6, CRP values, and the number of days on mechanical ventilation. Conclusion: The serial measurements of IL-6 values on days 2 and 3 were found to be predictive of patient mortality, making it an acute predictor of outcomes. A late rise in the IL-6 values after day 5 predicted increased mortality, CRP values on days 5 and 7 were found to predict mortality, later than IL-6. There was no correlation between the marker levels and the number of days of mechanical ventilation. The IL-6 values showed a significant correlation with increased length of stay in the ICU and hospital.

**References**


Central Venous Catheterization Related Thrombosis in ICU – Are We Harming Our Patients

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DOI: 10.5005/jp-journals-10071-24411.149

**Introduction:** Central Venous catheterization is a common procedure done in ICU for various indications. Thrombosis associated with central venous catheter insertion is a known complication associated with it but without any attached importance in our day-to-day ICU surveillance. So, we did an audit to find out the incidence and the
risk factors for thrombosis and to see any implications in terms of morbidity and mortality with central venous catheter related thrombosis. **Materials and methods:** Prospective observation of 39 patients who needed central venous line insertion over 3 months period (June 2022 – August 2022) was enrolled. We included patients with ages between 18 and 80 years, non-oncological patients, and only internal jugular vein (IJV) and subclavian vein (SCV) lines for the study. Data included type, size, side of central venous line insertion, attempts taken for insertion of the line, comorbidities, drug history, CRBSI incidence, DVT prophylaxis usage, and lumen patency were noted. Scanning over the insertion vessel was done using a high-frequency linear probe of USG on days 0, 3 and 7 days looking for thrombosis. Details regarding catheter-to-lumen ratio, presence of thrombus, and size of thrombus were noted. Using CXR, the tip of the central venous catheter line corresponding to the carina was measured to look for the proper positioning of the central line tip. The regular central line site and the corresponding limb were assessed for signs of DVT. The central venous catheter was removed either on day 7 or whenever there was no further need or when the lumen was blocked as per our ICU protocol. Data were analyzed and results were discussed. **Result:** On analyzing data, the incidence of thrombosis is surprisingly high (53%) among patients with central venous catheterization. The incidence of thrombosis is more among male (60%) than female (38%) patients, the reason is not clearly understood. Formation of thrombosis is associated with IJV than SCV and in IJV, a left-sided catheter (68%) more than a right-sided internal jugular vein (35%) which was statistically significant. Thrombosis risk was more with the presence of sepsis (80%) and the use of Intravenous Immunoglobulin (100%). The incidence of thrombosis was observed as early as day 3 (mean of 4.52+/− 1.81 days) of post-insertion. The use of DVT prophylaxis did not impact the incidence of thrombosis in our study. **Conclusion:** Central venous catheterization is associated with significant thrombosis risk. Incidence is more with Left-sided UV. Patients with sepsis and who are receiving IVIG have a higher risk for thrombus formation. We did not find any major complications or increase in mortality associated with thrombosis in our study. We intend to do a larger study with longer follow-up to look for the complications and mortality associated.

**Limit of Agreement of End Expiratory Values of Inferior Vena Cava (IVC) Diameter and Aorta in Subcostal and Trans-Hepatic Views for Determining Caval-Aortic Index**

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**Objective:** To define the limits of agreement of end – expiratory values of IVC diameter and aorta in subcostal and trans-hepatic views for determination of caval aortic index. **Introduction:** The assessment of the body’s fluid status is one of the most challenging tasks in clinical practice. IVC diameter and IVC aorta index are used for the estimation of volume status. Subcostal view of IVC is sometimes difficult due to bowel gas, abdominal surgeries, or abdominal trauma. Hence we are conducting this study to check the correlation of IVC and aorta diameter obtained in the trans-hepatic view as well as the subcostal view.

**Methods:** This was a Prospective observational study carried out in our hospital in which 62 patients with the shock of any origin requiring fluid bolus were analyzed. Patients with clinical signs of active expiration, intra-abdominal hypertension, and respiratory distress were excluded from the study. The internal diameter of the inferior vena cava (IVC) and aorta was measured in both subcostal and trans-hepatic views in patients in semi-recumbent position using a cardiac probe of the Sonosite™ (M-Turbo model) ultrasonography (USG) machine. The end-expiratory value of the inferior vena cava (IVC) diameter was measured in both views and limits of agreement of end-expiratory values of the IVC diameter in both views were analyzed using the Pearson correlation coefficient.

**Results:** The Pearson Correlation Coefficient in our study was 0.5005/jp-journals-10071-24411.150

**Therapeutic Effects of Inspiratory Muscle Training with Standard Physiotherapy vs Standard Physiotherapy Alone on Dyspnea Post Stroke Survivors**

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DOI: 10.5005/jp-journals-10071-24411.151

**Background:** Stroke is a sudden onset of focal neurological deficit lasting for more than 24 hours duration. Post Stroke is one of the major causes of long-term disability. Decreased respiratory muscle strength, altered chest wall kinematics, and decreased stability of the chest wall lead to a decrease in lung volume and impairment in lung function. **Objective:** To study find out therapeutic effects of inspiratory muscle training with Standard physiotherapy vs Standard physiotherapy alone on dyspnea post-stroke survivors.
Methodology: Twenty patients were allocated to the study and 10 patients were in each group. Group A received Standard physiotherapy exercise whereas Group B received Standard physiotherapy exercise and inspiratory muscle training. Post-test measures were taken after 8 weeks of training. The training is an unsupervised and home-based program. Outcome measures: Pulmonary function; maximal inspiratory pressure (MIP) and maximal expiratory pressure (MEP) using a modified sphygmomanometer and dyspnea by using a modified Borg scale.

Results: The data were analyzed using an independent t-test and paired t-test at a 5% level of significance. The pre-test mean value showed that there is no significant difference between the two groups and the post-test mean value showed improvement in both groups, greater improvements were observed in the inspiratory muscle training group. Values of maximal inspiratory pressure and maximal expiratory pressure were increased after training in group B and there is a marked reduction of dyspnea in the inspiratory muscle training group. Conclusion: This study concluded that inspiratory muscle training along with standard physiotherapy exercise is effective in improving pulmonary function and dyspnea stroke survivors. Keywords: Dyspnea, Maximal expiratory pressure, Maximal inspiratory pressure, Modified borg scale, Post-stroke survivors.

Reference

Assessment of Cardiac Intensive Care Unit Mortality Using General vs Unselected Cardiac Scores: A Qualitative Study

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Introduction: Despite a wide array of disease-specific risk scores in cardiology, there is no mortality risk prediction (MRP) scores for cardiac intensive care unit (CICU) patients. Hence, intensivists have to rely on general ICU (GICU) or disease-specific scores. While the GICU scores are good at discriminating mortality risk, they lack calibration, need 24-hour data, and depend on worst intraday values without consideration of trends of patient progress. The disease-specific scores can’t account for multiple acute cardiovascular diseases occurring simultaneously. Mayo CICU Admission Risk Score (M-CARS) is the first ‘unselected’ CICU score developed to rely on general ICU (GICU) or disease-specific scores.

OBJECTIVES: In light of M-CARS, we explored the general willingness of cardiac intensivists to use uCICU scores in their practice with an additional focus on preferences, limitations, and challenges of scoring mortality risk. Further, these inferences were compared with the use of GICU and disease-specific scores. Materials and methods: A semi-structured, four-section, 29-item preliminary questionnaire was designed. It focussed on the uses, practicality, credibility, and viability of uCICU scores in comparison to GICU and disease-specific scores. After validation, online and physical forms were distributed to senior cardiologists and intensivists who had experience using ICU risk scores. The respondents received a short M-CARS summary and were encouraged to explore recent advances in uCICU scores before responding. Besides the completion of the questionnaire, where relevant, an in-depth interview was conducted to get descriptive information, resolve ambiguity, and gain suggestions. The respondents consented to the use of their inputs for research purposes. Results: Most respondents (67%) frequently used GICU scores for MRP but were likely (75%) to drop their usage when extensive effort was required to collect the parameters (92%). They preferred a score that used <10 parameters (83%) that were entered as actual values (92%). They preferred uCICU score for predicting mortality and pre-admission triage, disease-specific score for eligibility and futility of therapeutic options, and GICU score for counseling and discharge decisions. An eligible score should be accurate, valid, have better discrimination and calibration, while rater-inter rater reliability carried lesser importance. Intensivists prefer using other scores to gauge therapeutic choices and would prefer the uCICU score as a stand-alone. Discussion: An ideal CICU score must integrate data from unstructured narrative notes and lab reports, use it to obtain a score, feed predictive models to provide real-time dynamic therapeutic decisions, and ultimately send app-based notifications. It should progressively recalculate the mortality risk, comment on organ failure, and account for non-cardiac complications. Further multicenter research is crucial to improve the predictive acuity and acceptability of uCICU amongst cardiac intensivists.

Reference

Impact of Early Palliative Care Intervention in a Tertiary Onco-Critical Care Centre

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Introduction: Advancement in treatment modalities of malignancy leads to an increase in the survival of patients that also increases intensive care admission. Critically ill cancer patients have a high burden of symptoms and caregivers also need support for decision-making. Professional Palliative care intervention in a critical care setting may provide good symptom control alleviate the distress among caregivers and help in decision-making. Material and methods: We retrospectively analyses of the two years of mortality data in a tertiary once critical care unit between January 2021 and November 2022. Perioperative mortality, mortality within 24 hours of ICU admission, and the patients who did not receive palliative care consultation were excluded from the study. Result: Out of a total of 189 mortalities 86 patients were included in the study. About 25 patients (29%) were received intubated and 43 patients (50%) were intubated in ICU. End-of-life care was initiated in 26 (30%) patients. Intubation (invasive ventilation), invasive lines, inotropic support, and further therapy escalation were avoided in 18 (21%), 26 (30%), 19 (22%), and 25 (29%) patients respectively. Terminal sedation with opioids and benzodiazepines was given to 60 (70%) patients. Conclusion: Timely and effective communication with the patient and their caregiver about advance care planning, goals of care and shift from curative to supportive or comfort care are effectively implemented by a multi-disciplinary team approach with early involvement of the palliative care team. Comfort care can be provided to patients at the end of life and justice could be provided to both patients and resources, especially in a resource-poor setting.

References

Ventilator Associated Pneumonia Dignosis by Lung Ultrasound
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DOI: 10.5005/jp-journals-10071-24411.154

Introduction: Ventilator-associated pneumonia (VAP) is a common nosocomial infection among critically ill patients on mechanical ventilation for ≥48 hours. It is associated with increased mortality and morbidity. Lung ultrasound (LUS) is a simple, non-irradiating, non-invasive, cost-effective, and bedside technique that can be used for diagnosing ventilator-associated pneumonia. Objective of Study: To compare the efficacy of lung ultrasound and chest X-ray in diagnosing ventilator-associated pneumonia. Methodology: Included 67 patients on mechanical ventilation with suspicion of VAP in ICUs of M S Ramaiah Medical College Hospitals. Ethical committee clearance – obtained. Ultrasound examination was done in six areas for each lung (superior and inferior areas in anterior, lateral, and posterior fields using anterior and posterior axillary lines as landmarks, with the transverse line between a parasternal and paravertebral line through the nipple), and the following ultrasound findings were looked at for:
- small subpleural consolidations echo-poor regions >0.5 cm in diameter
- lobar/hemilobar consolidation is defined by a tissue-like pattern.
- dynamic linear/arboreal air-bronchograms within lobar/hemilobar consolidations: hyperechoic images moving synchronously with inspiration.

Ultrasound findings and microbiological findings were collected in a score called Ventilator-associated pneumonia lung ultrasound direct gram stain examination and culture score. Results: Specificity 89.23% PPV >1 area of dynamic air bronchogram shows LUS findings (lobar consolidation shows 96.67% sensitivity, 83.33% specificity, 89.29% PPV, 90.09% NPV). >2 area of dynamic air bronchogram shows 53.33% sensitivity, 71.43% specificity, 94.12% of PPV, and 15.15% of NPV. >1 area of Subpleural consolidation shows 63.23% sensitivity, 28.57% specificity, 88.37% PPV, and 8.33% NPV. >2 areas of subpleural consolidation show 35% sensitivity, 85.71% specificity, 95.45% PPV, and 13.33% of NPV). Chest X-ray findings (infiltrates show 48.33% sensitivity, 71% specificity, 93.55% PPV, 13.89% NPV. Air bronchogram shows 18.33% sensitivity, 100% specificity, and PPV). Discussion: In agreement with our results, Mongodi et al. assessed the accuracy of lung ultrasound in 99 patients with suspected VAP lobar/hemilobar consolidation occurred universally in patients without VAP, with a sensitivity of 93% and specificity was 0. One or more areas with a small subpleural– consolidation had a sensitivity of 81% and a specificity of 41%, whereas one or more areas with a consolidation and dynamic air bronchograms had a sensitivity of 44% and a specificity of 81%. The specificity of these signs increased when they were present in a greater number of areas, VPLUS-EAgam ≥4 had a sensitivity of 48% and a specificity of 97%, VPLUS-EAgam ≥3 had a sensitivity of 78 up to 88% and a specificity of 77 up to 90%, VPLUS-EAgam ≥4 had a sensitivity of 57% and a specificity of 96%, VPLUS-EAgam ≥3 had a sensitivity of 83 up to 92% and a specificity of 79 up to 92%. It is observed that the sensitivity of lung ultrasound findings is higher than chest X-ray in diagnosing VAP. Hence lung ultrasound is better than chest X-ray for early diagnosis of VAP.

References
Comprehensive Survey of Resources, Quality Indicators and Outcomes of Intensive Care Units in India After COVID-19 Pandemic

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Introduction: The phenomenal growth of critical care medicine in recent years was further accelerated during the COVID-19 pandemic. In India, the intensive care units (ICUs) vary vastly by levels of centers, tiers of cities, and states. Although critical care is vital for saving lives, it is capital-intensive. Hence, judicious use of resources, adherence to protocols, and adaptive quality control are vital for every ICU. Objectives: Studies on the progress of ICUs after the pandemic are needed but scarce. We surveyed intensivists across different states and set-ups after the pandemic to assess the resources available to ICUs, their clinical processes, and outcome measures. Materials and methods: A comprehensive, semi-structured, nine-section and 54-item questionnaire was designed. It inquired about the respondent’s demographics, ICU structure, staff, equipment, facilities, patient information, operation and processes, infection control practices, electronic data, outcome measures, and satisfaction levels. After validation, the questionnaire was distributed amongst intensivists through online and physical forms. Social media and phone calls were used to send reminders. By completing the survey, the respondents consented to the use of relevant information provided by them for research purposes. Results: About 81 intensivists from 17 states and union territories of India completed the survey. The majority of the respondents were below 40 years (89%) and from academic institutions (74%). The ICUs were uniformly distributed in urban, suburban, and town/rural areas, mainly providing medicine (31%) or mixed (32%) services. Their average bed strength was 52 (IQR: 13–110) and full occupancy for more than 180 days was seen in 70% of settings. The difference in the availability of doctors on weekdays and weekends was significant (p < 0.01). Also, ICUs lacked a 24-hour in-house intensivist (63%) and had a poor nurse-patient ratio (1:3 or less) (44%). Use of outcome scores (79%), the practice of hand hygiene (99%), surveillance of ventilator-associated pneumonia (88%) and catheter-associated infections (>64%), standardized procedures for handover (69%) and documenting records (74%), use of daily goal sheets (68%), multidisciplinary rounds (74%), availability of tele-ICU coverage (59%), and high-speed internet (47%) showed promise. Improvement is desirable in developing palliative care protocols (28%), organ donation criteria (16%), and standardized mortality rate monitoring (41%). The average reported duration of ICU stay was seven days (IQR: 5–10), and average mortality rates were: in general (26%), for septic patients (37%), and for ventilated patients (41%). Readmission and night discharge rates of <25% were reported by 84% and 77% of respondents, respectively. The commonly reported errors were in communication and reporting. Discussion: Despite an overall improvement in sanitation practices, use of technology, and funding of the ICUs after the pandemic; respondents identified gaps in infrastructure, staffing, and uniform use of protocols that need improvement. Further research would help us gauge the modifiable gaps in intensive care practices, suggest quality improvement measures, and thereby help develop a universal prototype of standardized critical care.

Reference

Comparison of Nutritional Pattern and Use Between COVID and Non-COVID ICU Patients

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Introduction: Nutrition plays an important role in ICU patients, moreso in hypercatabolic COVID-19 illness. Among other life-threatening problems nutrition seemed to have taken a backseat in many hospitals due to logistics, reduction of manpower, isolation practices, etc. Objectives: To study the pattern and use of nutrition in our tertiary care COVID ICU in comparison to the non-COVID ICU. Materials and methods: An observational study was performed on 941 consecutive patients from March 2020 to June 2021 by collecting data from the nutrition software. In view of the various challenges faced in the delivery of appropriate nutrition and the hypermetabolic nature of the disease, a covid specific nutrition protocol was formulated at the start of the pandemic. It involved the use of enteral scientific feeding formula for all covid patients tolerating an oral diet. The protocol can be accessed at: https://www.opensciencepublications.com/fulltextarticles/IJN-2395-2326-7-216.html. The energy was prescribed using simple predictive equations (i.e., 25 kcal/kg). In the case of mechanically ventilated patients, indirect calorimetry-derived measures were used. All patients were prescribed 1.8 g/kg proteins. The protocol for nutrition patients remained the same with the exception that in non-covid patients’ oral supplements were added only if 50% of the kitchen diet was not taken within three days. The use of TPN for both groups remained as per the protocol. The software nutrition calculated the scientific feeding formulae (product) based on the prescription of energy, proteins, and volumes, taking into account the viscosity and precise water requirement per scoop of formula feed. Results: The mean length of ICU stay of COVID patients was 9.31 days as compared to 6.8 days in non-COVID patients. 8.8% of the patients required TPN as compared to 1.4% of the non-COVID population. Only 0.6% of the total enteral feeding in the covid ICU was with a kitchen diet alone compared to 7.8% in the non-COVID ICU. The incidence of use of supplemental nutrition was 97% per patient as compared to 57.6% per non-COVID patient. Among the scientific feeding formulae, the use of Peptamen (85%) was highest in COVID patients as compared to 25% in noncovered patients. The per day cost of nutrition for COVID patients admitted to the ICU was <0.01). Also, ICUs lacked a 24-hour in-house intensivist (63%) and had a poor nurse-patient ratio (1:3 or less) (44%). Use of outcome scores (79%), the practice of hand hygiene (99%), surveillance of ventilator-associated pneumonia (88%) and catheter-associated infections (>64%), standardized procedures for handover (69%) and documenting records (74%), use of daily goal sheets (68%), multidisciplinary rounds (74%), availability of tele-ICU coverage (59%), and high-speed internet (47%) showed promise. Improvement is desirable in developing palliative care protocols (28%), organ donation criteria (16%), and standardized mortality rate monitoring (41%). The average reported duration of ICU stay was seven days (IQR: 5–10), and average mortality rates were: in general (26%), for septic patients (37%), and for ventilated patients (41%). Readmission and night discharge rates of <25% were reported by 84% and 77% of respondents, respectively. The commonly reported errors were in communication and reporting. Discussion: Despite an overall improvement in sanitation practices, use of technology, and funding of the ICUs after the pandemic; respondents identified gaps in infrastructure, staffing, and uniform use of protocols that need improvement. Further research would help us gauge the modifiable gaps in intensive care practices, suggest quality improvement measures, and thereby help develop a universal prototype of standardized critical care.

Reference
was found to be comparable to non-COVID patient when a cost analysis was done. Conclusion: There was a 168% increase in the use of scientific feeding formula and a 60% increase in the use of TPN in COVID patients as compared to non-COVID patients. This is also reflected in an increase in the cost of feeding. The use of TPN seems to suggest an increased intolerance to enteral nutrition. The increased use of scientific feeding formulae may indicate the adherence to protocol and also seems to suggest that covid patients needed to be supplemented as kitchen feeds were unable to meet the requirements.

References

Changing Epidemiology of Acute Kidney Injury in Critically Ill Patients with COVID-19: A Prospective Cohort
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Fig 1: Acute kidney injury staging by day after ICU admission and stratified by COVID-19 wave
had significantly lower daily cumulative fluid balance (FB) than in wave 1. Fewer patients were dialysis dependent at 90 days in wave 2 (1% vs 4%; p < 0.001).

Conclusion: In critically ill adult patients admitted to ICU with COVID-19, the risk of AKI and receipt of KRT significantly declined in the second wave. The trend was associated with less MV and lower cumulative FB.

Ethics and End of Life Care in ICU-An Indian Institutional Perspective

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Ethical consideration on End of life care (EOLC) in ICU always remained a poorly read and discussed topic of medical literature. Though most of the ICU follow end of life care policy with better treatment support required at terminal stage of disease and daily communication with the patient family but when it comes to the rule and ethics, hardly few of physician are aware of. End of life care becomes easy in the country with code and conduct on euthanasia but in middle income country and our country practicing end of life care is difficult because whether to withholding treatment or withdrawing treatment is not backed by the court of law. Moreover financial constraint put physician in a dilemma whether to continue therapy adding more financial burden to patient family or to send patient LAMA. LAMA is a easier way of looking into the matter but it defeats whole purpose of end of life care, moreover it abandon the basic principal of medical ethics i.e., autonomy. This writing is all about to discuss the ethical aspect pertinent to end of life care in resource poor country especially in India.

A Case of Methotrexate Induced Pulmonary Toxicity Presenting Subacutely

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Introduction: Rheumatoid arthritis is a common rheumatologic disease which needs various DMARDs to treat it effectively. Methotrexate is one of the first line treatment and is very effective but carries a risk of serious injury to lungs which demands stopping the medication and institute appropriate therapy as OPD or IPD patients (sometimes even in ICU). Our patient presented with subacute dyspnea and she was needed to be treated in ICU. We ruled out infectious causes as well as small vessel vasculitis in our patient and she was diagnosed to be suffering from methotrexate induced subacute lung injury. Objectives: To assess the cause of subacute dyspnea in a patient with rheumatoid arthritis on methotrexate. Materials and methods: A 60-years-old female known diabetic on irregular medication with poor glycemcic control presented with subacute onset shortness of breath with cough and fever for 5 days. She was desaturating on room air. Hemodynamics were stable. She was admitted to ICU and put on a nonrebreathing face mask with 100 % Fi02. She had high respiratory effort and was subsequently put on NIV. Her ABG showed type 1 respiratory failure. Bedside echocardiography was normal and point of care BNP was mildly elevated. Her CT showed ground glassing and a PFT with DLC0 after stabilization showed reduced parameters. Her fire respiratory panel COVID RT PCR and vasculitis profile was negative. She was recently diagnosed to be suffering from rheumatoid arthritis and was put on injectable methotrexate 1 month back. Results: Methotrexate was stopped and an IV steroid was started and she improved quickly. Conclusion: Methotrexate pulmonary toxicity can be acute subacutae or chronic and can present as early as 12 days after the start of methotrexate. Treatment involves stopping the medication and initiating steroids in severe cases. Intensivists should be aware of the entity and the case highlights the importance of medication history in sick patients.

Evaluation of PCO2 Gap as Resuscitation Marker in Shock Patients

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Objectives: To study the role of the PCO2 gap in the evaluation of shock patients.

Materials and methods:
• A single-center, prospective observational study has been done with patients having shock, admitted to Critical Care Unit.
• Patients aged <18 years, patients having ARDS, CKD, underlying IHD, and pregnant patients have been excluded.
• All baseline parameters i.e., Mean Arterial Pressure, Urine Output, PCO2 gap, Serum Lactate, and Cardiac Index have been recorded.
• All patients were resuscitated in accordance with the recommendation of the Surviving sepsis guidelines.
• Data were collected at 6-hours intervals during the first 24 hours after ICU admission.

Results
• Primary outcome, i.e., changes in PCO2 gap in accordance with the resuscitation.
• Secondary outcome, i.e., changes in Cardiac Index, Urine Output, and Serum Lactate.
**PCO₂ Gap:**

<table>
<thead>
<tr>
<th>Low PCO₂ Gap (Fluid responsive group)</th>
<th>p-value</th>
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<tbody>
<tr>
<td>T0 (10.43 ± 4.08)</td>
<td></td>
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<tr>
<td>T6 (4.83 ± 0.62)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T12 (4.14 ± 1.11)</td>
<td></td>
</tr>
</tbody>
</table>

PCO₂ gap was decreasing from T0 hours to T12 hrs and is significant up to first 12 hours and is not significantly different between T12 and T24.

**Cardiac index:**

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<thead>
<tr>
<th>Cardiac Index (Fluid responsive or low gap group)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0(2.99±0.33)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T6(3.17±0.32)</td>
<td></td>
</tr>
<tr>
<td>T12(3.27±0.36)</td>
<td></td>
</tr>
</tbody>
</table>

Cardiac Index was increasing from T0 hours to T12 hours, and is significant and not significantly different between T12 and T24. i.e., patients were fluid responsive up to 12 hours from the start of the resuscitation and there is no significant improvement in cardiac index after 12 hours.

The above two tables shows that there is significant improvement in serum lactate and urine output in low PCO₂ gap group as compared to high PCO₂ gap group.

<table>
<thead>
<tr>
<th>Fluid responsive or high PCO₂ gap (Mean Value)</th>
<th>T0</th>
<th>T6</th>
<th>T12</th>
<th>T24</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCO₂ gap</td>
<td>10.43</td>
<td>12.93</td>
<td>13.66</td>
<td>15.82</td>
</tr>
<tr>
<td>Sr. Lactate</td>
<td>3.45</td>
<td>3.52</td>
<td>3.7</td>
<td>3.61</td>
</tr>
<tr>
<td>Urine output</td>
<td>33 ± 5.6</td>
<td>32.68 ± 6.42</td>
<td>26.88 ± 6.42</td>
<td>23.75 ± 6.6</td>
</tr>
<tr>
<td>Cardiac Index</td>
<td>2.99 ± 0.33</td>
<td>2.86 ± 0.36</td>
<td>2.86 ± 0.36</td>
<td>2.73 ± 0.36</td>
</tr>
</tbody>
</table>

**ROC of PCO₂ gap at T12 in the prediction of mortality**

At this cut-off (>7), the sensitivity of PCO₂ gap at T12 is 95% and specificity is 76.67%.

**ROC of PCO₂ gap at T24 in the prediction of mortality**

At this cut-off (>10), the sensitivity of PCO₂ gap at T24 is 90% and specificity is 90%.
Conclusion
• Our study is still ongoing and after evaluating the present data, we could say that patients in shock are fluid-responsive for the first 12 hours.
• PCO₂ gap can be effectively used as a resuscitation marker for the first 12 hours.
• Patients having PCO₂ gap <6 mm Hg at T12 hours have less ICU length of stay and mortality while patients having persistently high PCO₂ gap >6 mm Hg at T24 hours have more ICU length of stay and mortality.

Early Hemoperfusion – The Key to Survival in Acute Paraquat Poisoning?

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DOI: 10.5005/jp-journals-10071-24411.161

Paraquat is one of the commonly used herbicides in India and its consequences after ingestion is disastrous. It is much more troublesome to manage paraquat poisoning due to increased morbidity and mortality and lack of effective treatments. The lethal dose of paraquat is approximately 10 mL of 20% solution. The concentration of paraquat in plasma reaches the maximum at 2 hours after ingestion and gradually decreases after 15–20 hours. Paraquat is rapidly distributed to tissues with the largest concentrations being found in the lungs and kidneys. In the treatment of paraquat poisoning at the early stages, traditional detoxification strategies like adsorption, gastric lavage, catharsis, and removal of paraquat through blood purification are also of paramount importance. Early hemoperfusion is one of the methods which can improve survival in paraquat poisoning. Here we report case series of four patients presented to our center with paraquat poisoning. Case 1: A 50-year-old female with a past medical history of diabetes and hypertension, alleged to consume around 50 mL of paraquat was presented to our center within 12 hours of ingestion. She was already given gastric lavage and activated charcoal at another hospital. On arrival, the vitals and lab parameters were stable except ABG showing metabolic acidosis and Leukocytosis. The urine dithionate test performed upon presentation was positive for Paraquat. The decision was made to initiate resin-based hemoperfusion. The urine dithionate test performed after the first session of resin-based hemoperfusion was negative. Two more sessions of hemoperfusion were done between the time interval of 12 hours. The patient was also initiated on Pulse steroids, cyclophosphamide, and N-Acetylcysteine infusion. The patient had no oxygen requirement or decline in urine output during the hospital stay. The patient was then discharged in stable condition after 7 days of hospital stay. Case 2: A 14-year-old female patient was presented to our center after alleged consumption of 50 mL of 24% paraquat. The patient was presented to our hospital after gastric lavage and activated charcoal at a primary care center within 6 hours of ingestion. Upon presentation, her vitals and lab parameters were stable. She was also then initiated on resin-based hemoperfusion via a dialysis catheter. Urine dithionate test conducted after 1st session of hemoperfusion ranged around 10–30 mcg/mL. The patient underwent two sessions of resin-based hemoperfusion and a dithionate test after the second session was negative. Other supportive measures given included, Pulse Steroids, N-Acetylcysteine, and antioxidants. She was admitted to the hospital for 7 days and her hospital stay was unremarkable for oxygenation and renal function. Case 3: A 21-year-old female alleged to consume about 100 mL of Paraquat 24%. She was given primary treatment elsewhere and came to our center for further treatment. The patient was admitted to our center approximately 7 hours after paraquat ingestion. On arrival the patient was tachypnoea, ABG revealed severe metabolic acidosis. NIV support and Sodium bicarbonate infusion were given. Resin based hemoperfusion was also initiated. Her hemodynamic worsened and was started on dual inotropes. Other supportive measures including Pulse steroids and Cyclophosphamide were given. Her urine output dropped to 50 mL per hour by 12 hours after consumption of paraquat. Due to financial constraints, the patient went AMA to another hospital. Case 4: A 31-year-old male deliberately consumed 30 mL of Paraquat 24% and presented to our hospital within 6 hours of ingestion. A urine dithionate test was conducted for the patient and was positive. The patient then initiated resin-based hemoperfusion for 4 hours. The dithionate test conducted after the hemoperfusion session was negative. The patient was also treated with Vitamin E, Acetylcysteine infusion, and pulse steroids. The patient had no hypoxic issues while on hospitalization. The patient was then discharged after 2 days of hospital stay. Discussion: For the successful management of paraquat poisoning, the window of opportunity is very narrow and lasts only for a few hours. The prime management of paraquat poisoning consists of gastrointestinal decontamination by using activated charcoal. The supportive measures include early elimination of paraquat in serum using hemoperfusion, inhibiting the inflammatory response via immunosuppressant medications (Cyclophosphamide and methylprednisolone) and antioxidants (Vitamin C and N-Acetylcysteine). The effectiveness of hemoperfusion in paraquat poisoning depends upon the early and complete removal of blood paraquat. A prospective observational study conducted by Xumin et al., compared goal-oriented hemoperfusion with routine hemoperfusion and continuous venovenous hemofiltration. The goal-oriented arm conducted a urine dithionate test after each resin-based hemoperfusion sessions. The study concluded that mortality was much lower in the goal-oriented group by 7 days, but there was no significant difference in mortality by 28 days. However, mortality was much lower in patients who have consumed paraquat less than 50 mL. Hemoperfusion is beneficial if initiated within 12 hours of paraquat ingestion. Several studies demonstrate the ineffectiveness of hemoperfusion in patients presented 12 hours after paraquat ingestion. The peak time of plasma paraquat is 1–3 hours. If hemoperfusion is not initiated by this time period, lethal concentrations of paraquat will be achieved by highly vascularized tissues of the body, rendering ineffectiveness of hemoperfusion sessions. So initiating hemoperfusion sessions as early as possible may reduce bad outcomes in paraquat poisoning. One of the most effective ways to treat paraquat poisoning is to perform hemoperfusion before the paraquat level is reached the peak, keeping in mind the fact that paraquat peak plasma concentrations are achieved within one hour of ingestion. The best extracorporeal modality in the management of paraquat poisoning is hemoperfusion rather than hemodialysis because of the higher rate of reduction of plasma paraquat levels by hemoperfusion. The high incidence of acute kidney injury after paraquat intoxication is challenging. This is due to the fact that kidneys can remove more paraquat than hemoperfusion and is very effective when the renal
function is normal. So, preserving adequate kidney function is also important for the elimination of paraquat. **Conclusion:** From this case series, for patients with acute paraquat poisoning, presenting within 12 hours of ingestion resin-based hemoperfusion combined with urine dithionate test may provide mortality benefit.

### References

Introduction: SGLT-2 Inhibitors are FDA approved to reduce risk of CV deaths in T2DM subjects and CVD subjects. It showed great amount of reduction in 3P-MACE and NYHA classification for potential heart failure. shown to improve vascular functions by attenuating endothelial cells activations, inducing direct vasorelaxation, reducing endothelial cells dysfunction and molecular changes associated with early artherogenesis, decreasing arterial wall stiffness and decreasing vascular stiffness along with natriuresis effect. However, there have not been many studies addressing cardiovascular outcomes, renal burden, obesity paradox, pharmacoeconomic criterion and euglycemic ketoacidosis since its approval by FDA in 2014. This study emphasizes on the same using multiple global parameters.

Objectives:

- To evaluate the efficacy of dapagliflozin in cardiovascular disease outcomes using global parameters.
- To assess the renal burden in patients by analyzing biochemical parameters.
- To analyze medication adherence from the pharmacoeconomic burden and also study obesity paradox in potential cardiovascular diseases.

Materials and methods: In this study, we did a retrospective analysis of 120 patients admitted between August 2022 and October 2022 by dividing them into 2 arms in which the control arm consisted of subjects who received standard of care for cardiovascular diseases while the interventional arm consisted of subjects who received Dapagliflozin along with the standard of care. All the subjects were then screened for various parameters such as demographic differences, LVEF, LVIDd, NYHA classification, and 3P-MACE along with renal parameters such as eGFR, CrCl, Serum potassium creatinine etc., on 3 parameters i.e., on admission, on discharge, and after 2 months along with concomitant medicine usages and their cost burden for medication adherence which were then tabulated and analyzed using various biostatistical tests. Results: Out of 124 patients with cardiovascular diseases were involved (n = 124) and equally distributed in 2 arms (n = 62), Arm A (Interventional arm) consisted of 41 males (66.1%) and 19 females (30.5%) while Arm B (Control arm) consisted of 46 males (75.4%) and 15 females (24.5%). Obesity survival paradox was noted as obese subjects with BMI >30 kg/m² (n= 41) with a comparative decline (however not significantly) in ARM A vs ARM B with Hazard ratio of (0.95–1.08) and 0.94 (0.86–1.00, CI 95%). There was no significant increase noted in serum potassium level in ARM A. 2 cases of adverse event was noted in ARM A with the subject of AKI, i.e., decreasing renal function. Hence could conclude that dapagliflozin is a safe drug of choice for subjects with critical cardiovascular diseases with caution for renal impaired subjects for preventing potential cardiovascular deaths. Discussion: In this study, we found that dapagliflozin is a safe drug for use in diabetic patients with cardiovascular diseases and is associated with rapid reduction of cardiovascular death risk or heart failure. It should however be used with caution in patients with renal impairment as it can lead to aggravation. In patients, without T2DM or overweight it shouldn’t be used as it can lead to hypoglycemia and substantial weight loss. Grant acknowledgement: None.

References


Respiratory Variations of Internal Jugular Vein: Can It Bring a New Horizon for Predicting Fluid Responsiveness in Critically Ill Patients? Subhankar Paul1, Pradyut Bag2, Rajesh Pande3 1,2BLK-MAX Centre for Critical Care, BLK - MAX Superspeciality Hospital, Pusa Road, New Delhi, India

Introduction and Objectives: Checking for fluid responsiveness before giving fluid bolus to patients with acute circulatory failure is extremely important. Ultrasonographic Inferior Vena Cava (IVC) diameter variations have already been used popularly by critical care physicians for this purpose which is however difficult to access in many subsets of patients. The objective of this study was to evaluate whether the ultrasonographic assessment of respiratory variations in Interna Jugular Vein (IJV) diameters can serve as a simple and reliable indicator of fluid responsiveness in critically ill patients along with a correlation of the same with IJV respiratory variations. Materials and methods: After obtaining institutional scientific and ethical committee clearance we performed a prospective observational study amongst critically ill adult patients in ICU. We checked portable ultrasound-guided diameters of IJV and IVC along with other hemodynamic parameters before and after the Passive Leg Rising test (PLR) and after fluid bolus in fluid-responsive patients. The working definition of “Fluid responsiveness” in our study was an increase in LVOT-VTI by ≥ 10% after performing the PLR maneuver for 1 minute. IVC or IJV Collapsibility Index was calculated before giving fluid bolus to patients with acute circulatory failure and is associated with rapid reduction of cardiovascular death risk or heart failure. It should however be used with caution in patients with renal impairment as it can lead to aggravation. In patients, without T2DM or overweight it shouldn’t be used as it can lead to hypoglycemia and substantial weight loss. Grant acknowledgement: None.

References

Collapsibility, distensibility, and variability indices of both IJV and IVC were significantly higher among fluid-responsive patients than non-responsive patients at baseline. In fluid-responsive patients, these values were significantly reduced following fluid bolus supporting initial evaluation. However, there was a poor correlation between IJV and IVC collapsibility index (Pearson correlation = 0.31, R² = 0.1, p-value = 0.09) in spontaneously breathing patients. A significant positive correlation was found between the Distensibility Index (Pearson correlation = 0.61, R² = 0.377, p-value < 0.001) and Variability Index (Pearson correlation = 0.85, R² = 0.723, p-value = 0.001) of IVC and IJV. Area Under ROC of IJV collapsibility, distensibility, and variability indices were 0.78, 0.951, and 0.94 respectively. IJV Collapsibility Index cut off >37.15% (sensitivity of 52% and specificity of 100%), IJV Distensibility Index cut off >16.1% (sensitivity 93.9%, specificity 91%) and IJV Variability Index >14.9% (sensitivity 96.4% and specificity 86%) were determined for predicting fluid responsiveness among critically ill adult patients in our study. **Conclusions:** In conclusion, ultrasonographic evaluation of UV diameter changes with respiration is a good, reliable, simple, and bedside examination for fluid responsiveness in critically ill patients. Further large multicentric studies should be undertaken to validate this result. **Keywords:** Critically ill, Fluid responsiveness, Fluid therapy, Ultrasonography

**References**


Assessing the Impact of COVID-19 Vaccine on Disease Severity and Death Outcome

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Introduction: In a world with the second highest number of infections in the world and more than half a million COVID-19 deaths, the role of the COVID-19 vaccine in controlling the spread of disease, its efficiency, and safety is a vital concern. Objective: The current paper aims to find the proportion of patients administered at least one dose of the COVID-19 vaccine and the difference in outcomes. Materials and methods: A retrospective single-center study was conducted between December 2021 and February 2022 at Sir H. N. Reliance Foundation Hospital and Research Center, Mumbai. A total of 256 patients having severe COVID-19 infection are included in the study. The study population was divided into two groups: Vaccinated and non-vaccinated. Patient demographic and clinical characteristics were retrieved from the electronic medical records. Categorical data was presented as numbers and percentages, and the Chi-square test or Fisher's Exact test is used to analyze the difference between the two groups. Continuous data are checked for normality using a Shapiro-Wilk test presented as mean and standard deviation. An independent t-test or Mann-Whitney U-test is used to check the group's differences. A two-tailed P value of < 0.05 is considered statistically significant. All statistical analyses are performed using STATA 16.0. Results: A total of 256 patients are included in the study, out of which 88 (34.4%) had received vaccination whereas 168 (65.63%) have not received any COVID-19 vaccine dose. Predominantly Male gender was noted in both groups of patients. The mean age of the patients in the study is approximately 65 years. There is no difference in proportion between the 2 groups for comorbidities like obesity, hypertension, diabetes, and IHD. Surprisingly very few CKD patients were vaccinated. Non-vaccinated patients had more severe disease (CTSI 11.2 vs 8.17, p = 0.010) and P/F <100 (18.5% vs 9.1%, p = 0.048). In the non-vaccinated group, 48% of the patients required mechanical ventilation, while just 22.73% of those in the vaccinated group required it (p-value: 0.00). More patients in the non-vaccinated group of patients developed septic shock as compared to the vaccinated (20.8% vs 11.4%) non-significant. GI bleeding occurred only in 3.41% of cases in the vaccinated group compared to 11.9% in the non-vaccinated group (p-value: 0.023). Mortality was observed more in the non-vaccine group as compared to the vaccinated group (36.3% vs 19.3%, p = 0.005). Discussion: The government has provided free COVID-19 vaccinations to all adults in the country since May 2021, but the vaccination rate was still low. Just one-third of the study population was found to be vaccinated. This study shows that patients who have been vaccinated against COVID-19 were less severely therefore the exponential benefits of the vaccine are vividly apparent. Conclusion: Results indicate that using vaccines decreased the severity of COVID-19 infection, reducing the requirement for mechanical ventilation and increasing the probability of survival. Also, complications like Septic shock and GI bleeding decreased in the vaccinated group compared to the non-vaccinated.

Reference

A Rare Presentation of Acute Gastroenteritis: Osborn J Wave
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DOI: 10.5005/jp-journals-10071-24411.167

This report is about a 45-year-old male who presented to the emergency at our institute with acute gastroenteritis and shock. On examination, his pulse and blood pressure were not recordable. His immediate ECG showed J point elevation suggesting the presence of Osborn j wave. His temperature was 88° Fahrenheit. His serum electrolytes were sent immediately and were normal including his serum calcium. He has managed aggressively in the ICU and survived. The next day, in the ECG Osborn J wave, disappeared. His further course in the hospital was uneventful and was discharged. This is the rare presentation of acute gastroenteritis with ECG findings of Osborn, after a thorough search of the literature. Early identification in such cases may streamline the management resulting in better outcomes. Introduction: Osborn J waves or the camel-hump sign can be caused by hypercalcemia, brain injury, subarachnoid hemorrhage, cardiopulmonary arrest from oversedation, vasospastic angina, or ventricular fibrillation. However, the chief cause is hypothermia (body temperature, < 90°F). Other ECG changes in hypothermia are bradycardia; junctional slow rhythms; prolonged PR, QRS, and QT intervals; shivering artifacts; ventricular ectopy; and cardiac arrest due to asystole or ventricular tachycardia or fibrillation. J waves occur when a heterogeneous distribution of potassium current increases the activity of a cardiac transient outward potassium current caused by low temperatures. Patient with acute gastroenteritis (AGE) presenting with Osborn J wave is rarely encountered, although AGE is very common. Case: This report is about a 45-year-old male who presented to the emergency at our institute with acute gastroenteritis and shock. He had multiple episodes of watery stools and vomiting for 4–5 days. On examination, his pulse and blood pressure were not recordable. His immediate ECG showed J point elevation suggesting the presence of Osborn j wave. His temperature was 88 degrees Fahrenheit. He was managed with aggressive fluid boluses and other supportive care including insulation with warm blankets and external warming. Investigation: His serum electrolytes were sent immediately and were normal...
including serum calcium. Immediate ECG with the Osborn J wave is shown in Figure 1. The next day, in the ECG, the Osborn J wave disappeared. Figure 1 A 12-lead electrocardiogram obtained at a body temperature of 88°F. Note the Osborn waves, which have an extra deflection at the end of the QRS complex. Figure 2 A 12-lead electrocardiogram was obtained the next day later—after rewarming the patient. Notably, the Osborn J wave disappeared.

**Diagnosis:** He had Acute Gastroenteritis with hypothermia and Osborn J wave in the ECG, which is a rare presentation. Early identification and prompt treatment is the key to patient management. **Discussion:** Osborn waves, also known as J waves, camel-hump waves, or hypothermic waves, are best seen in the inferior and lateral precordial leads. They become more prominent as the body temperature decreases, and they resolve gradually with rewarming. In hypothermia J waves appear due to increase in the activity of a cardiac transient outward potassium current caused by low temperatures while in hypercalcemia J waves are presumably due to an increase in the calcium-activated outward current and a decrease in the inward calcium current which leads to all-or-none repolarization of the action potential (end of Phase 1 in the epicardium), creating an Ito channel-mediated transmural voltage gradient during ventricular repolarization. This case highlights the importance of recognizing the J wave, or Osborn wave, and distinguishing it from the ST-segment elevation seen in ischemic cardiac injury. Identification of the J wave is neither a specific finding nor predictive of patient outcome from hypothermia; however, an ECG should be performed in all patients with hypothermia as it serves a pivotal role in preventing progression to ventricular arrhythmia by prompt intervention and management.

**References**


3. Deshpande A, Birnbaum Y. ST-segment elevation: distinguishing it from the ST-segment elevation seen in ischemic cardiac injury. Identification of the J wave is neither a specific finding nor predictive of patient outcome from hypothermia; however, an ECG should be performed in all patients with hypothermia as it serves a pivotal role in preventing progression to ventricular arrhythmia by prompt intervention and management.

**Assessment of Blood Components Utilization in Medical Intensive Care Unit (MICU) at Tertiary Care Hospital**

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DOI: 10.5005/jp-journals-10071-24411.168

**Objective:** To evaluate blood and blood products utilization of medically ill patients in medical intensive care unit (non-surgical patients).

**Materials and methods:** After approval from Ethical Committee, a prospective study was conducted from 1st September to 30 November 2022 in the medical ICU at Aditya Birla Memorial Hospital Pune. This Medical ICU (MICU) has 24 beds and patients from Departments like Internal Medicine, Cardiology, Oncology, Nephrology, Gastroenterology, and Pulmonology are admitted to MICU. Patients with incomplete data or those patients who received blood components but left against medical advice were excluded from the study. For those patients who received blood components, their data was recorded which includes patients’ demographic characteristics like age and sex, clinical data like diagnosis, and pre-transfusion lab in form of hemoglobin (HB), Platelet count or PT INR along with Sequential Organ Failure Assessment (SOFA) score on the day of transfusion, Acute Physiology And Chronic Health Evaluation Score (APACHE Score) on the first day of admission, length of Stay in ICU, and the outcome was recorded. **Results:** Approximately 431 patients admitted during the study period, among them 102 (23.67%) patients received blood components transfusions in medical ICU. Among the types of blood components packed red blood cells transfusion was highest followed by other blood components. Platelet transfusion is required mainly in dengue patients. The average pretransfusion HB was a mean of 6.80 ± SD 1.78. While average Platelet Count pretransfusion was a mean of 19076 ± SD = 11096.19. A total of 102 patients received Blood Components 69 patients (67.64%) require Routine transfusion (from 8 am to 8 pm), while 26 patients (32.36%) required emergency (from 8 pm to 8 am) transfusion. Among 431 total patients admitted to MICU 45 patients (41.1%) require blood components transfusions on the day of admission to ICU (day 0), 30 patients (29.41%) require transfusion during the next two days, 15 patients (14%) of patients require transfusion from 3 to 5 days and 12 patients (11%) patients require transfusion after the 6th day of admission to MICU. Those patients having high APACHE scores on admission and those patients having high SOFA scores on the day of transfusion require multiple components of transfusion. The patients who have received blood components average MICU length of 7.75 days. Overall transfusion-related reactions were less during this study and almost all patients received blood components transfusions as per institutional blood transfusion policy which is based on national and international guidelines. The incidences of transfusion reactions were low due to the strict quality standards followed at Transfusion Medicine Department. **Conclusion:** The Restrictive Strategy for use of Blood Products as per guidelines was followed. Patients who have more APACHE Scores on admission and more SOFA score on the day of transfusion require more Blood Components transfusion.

**References**


Introduction: Acquisition of Nosocomial infections in COVID-19 patients admitted to the intensive care unit (ICU) has been reported in several facilities. Also known as hospital-acquired infections (HAI) have increased mortality, and cost of care, especially if caused by multidrug-resistant (MDR) strains. Objective: The objective of the study was to assess the clinical features and outcomes associated with HAI in the ICU of COVID-19 patients. Materials and methods: In a retrospective single-centered study of adult COVID-19 patients, admitted to the ICU between May 2020 to March 2021 at Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, India, data on epidemiological, clinical and microbiological features of HAI, were retrieved and their outcome was evaluated. Results: Out of 505 COVID-19 ICU patients admitted to the hospital within the study period, 52 patients (9.71%) acquired HAI of which 8 were early HAI (within 7-days of ICU admission). Mortality was 40.4% with the median age 70 and 73 years and median length of hospital stay 34 vs 21.5 days (p = 0.0074) of survivors and non-survivors respectively. Survivors among males and females were 55.3% and 71.4% respectively. Septic shock was observed in 85.7% of non-survivors vs 58.1% of survivors. Out of the total HAI, 44.4%, 22.2%, 17.8%, and 15.6% developed Central line-related bloodstream infections; Catheter-related urinary tract infections; Ventilator-associated Pneumonia, and Secondary infections respectively. Overall, 10 different organisms were detected in HAI, of which, Gram-negative were 55.6%, Gram-positive and fungal were 22.2% each. Enterococcus group was the most common Gram-positive bacteria (19.56%). Gram Negative bacteria in the decreasing order were; Acinetobacter baumannii (17.3%), Pseudomonas aeruginosa (15.2%), and Klebsiella Pneumonia (13%). Mortality was the highest among the fungal infection group of HAI (63.6%) followed by Gram-negative organisms (42.3%), and Gram-positive organisms (44.4%). Mortality associated with MDR was 38.8%. Over the study period, a maximum of HAI (10 patients) were recorded in the month of October 2020. In order to curtail this increasing incidence of HAI, stringent infection control measures such as restricting the use of Carbapenem in antibiotics policy, the use of coloured gloves surveillance allowed only for bedside care, adhering to strict hand hygiene practices and cohorting of these patients were adopted. In addition, environmental hygiene by using higher concentration of 2% formaldehyde for high touch surface disinfection of rooms with patients harbouring MDR bugs and relative humidity control to <60% with de-humidifiers, was implemented these measures helped to reduce of HAI rates (Fig. 1). Discussion: Yan et al, in a single-center study of a mixed patient population, described the microbial cause of 65 HAI and its association with a higher mortality rate. Our data is in agreement with the previous studies that have documented incidences of HAIs in patients with COVID-19 ranging from 10% to 45%. With regards to mortality contributed by MDR strains, the present study had lower incidences (38.8%) as compared to 60.5% reported by the ICMR study. Conclusion: In the present study, we observed the predominant HAIs were with gram-negative multidrug-resistant bacteria however patients with fungal infection had the highest mortality.

References


Fig. 1:
Impact of Serum Magnesium Level in Prognosis of Septicemic Patients  
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DOI: 10.5005/jp-journals-10071-24411.170

Background: Magnesium deficiency is one of the underdiagnosed electrolyte abnormalities in clinical practice. The prevalence of hypomagnesemia is high in septic shock patients with increased mortality and prolonged hospitalization. Aim and objective: We aimed to study the level of serum magnesium in septic shock patients admitted to the intensive medical care unit and to find the prevalence of hypomagnesemia in septicemic patients. Our second objective was to correlate the magnesium level with the outcome of APACHE II scoring. We have also elucidated the correlation between serum magnesium levels and the mortality of patients in septic shock. Materials and methods: A prospective cross-sectional observational study in 372 septic shock patients admitted to the intensive medical care unit, in ESIC Medical College & Hospital, Faridabad including Acute Physiology and Chronic Health Evaluation (APACHE II) score calculated for each patient on the day of admission. Septic shock patients aged between 18 and 70 years age group were included. Written and informed consent was obtained. Patients who had received blood products, and magnesium or calcium infusions before sampling have been excluded. Venous blood samples were taken to assess serum magnesium levels, on the day of admission, days 3, and 7. Patients were followed up till discharge or death. Results: In our study, 372 patients were admitted to the intensive medical care unit with the diagnosis of septicemia, out of these 102 (27.42%) were found to have low magnesium levels (1.39 ± 0.32). The most common complications seen in a subset of hypomagnesemia patients were arrhythmia (25.49%), seizure (10.78%), tetany (6.86%), delirium (11.76%), etc. It was also seen that during the study patients with hypomagnesemia had more chances of multiorgan failure (37%), longer duration of ICU stay (6.07 ± 0.35), high requirement of mechanical ventilation (16.6%), respiratory failure (14%) and mortality (15%). Conclusion: This study highlights hypomagnesemia prevalence was high in septic shock patients with higher mortality and longer duration of ICU stay and ventilator support. Keywords: APACHE II, Hypomagnesemia, Mortality, Septic shock.

Study of Serum Amylase and Serum Cholinesterase Levels in Cases of Organophosphorous Poisoning and Its Correlation with Severity of Disease  
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DOI: 10.5005/jp-journals-10071-24411.171

Background: Poisoning due to organophosphorus compounds is very commonly seen. These OP compounds are the main components of herbicides, pesticides, and insecticides. These are easily available in developing countries like India. Biochemical markers that predict the course of the disease can be helpful in early triage and timely implementation of appropriate measures. Earlier plasma cholinesterase level was used to assess the severity of poisoning. Presently serum amylase is being recommended as a better indicator of severity. Objectives: To study plasma cholinesterase and serum amylase levels in acute organophosphorus poisoning and to correlate serum amylase levels with clinical severity and outcome. Material and methods: The study was an observational study conducted in the Department of Medicine, Netaji Subhash Chandra Bose Medical College, and Hospital, city of Jabalpur in the state of Madhya Pradesh, India. The study was conducted from 1st December 2020 to 31st September 2022. 80 patients presented with consumption of Organophosphate compound were included in the study with a history of ingestion within 24 hours. Estimation of plasma cholinesterase and serum amylase was done at the time of admission. Clinical severity was classified according to the Peradeniya Organophosphorus Poisoning scale. Results: The occurrence of organophosphorus poisoning was more common among the age group 21–30 years. Majority [21 (26.25%)] of patients were laborer followed by farmer [20 (25.00%)], student [19 (23.75%)] and housewife [16 (20.00%)]. Monocrotophos (45.0%) was a commonly used compound. The mean value of plasma cholinesterase and serum amylase at admission were 2106U/L, and 172U/L. There was significant inhibition of plasma cholinesterase and elevation of serum amylase at admission. The proportion of patients with serum cholinesterase <2500 U/L and serum amylase (U/L) >1600U/L was significantly higher in cases of severe poisoning. There is a significant correlation between the severity of poisoning and the degree of derangement of serum cholinesterase and serum amylase level at the initial presentation. Diagnostic accuracy of biochemical parameters showed that serum cholinesterase had the highest diagnostic accuracy than serum amylase. Serum cholinesterase (U/L) was the best predictor of mortality as compared to serum amylase.

Conclusion: Serum cholinesterase and serum amylase levels may be considered a marker of Organophosphorus intoxication since it enables the early recognition of severity and identify those at risk of developing complications of Organophosphorus poisoning.

Unusual Outbreak of Ralstonia Pickettii Infections in Adult Intensive Care Unit of a Tertiary Care Hospital  
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Background: Ralstonia pickettii is a Gram-negative bacillus commonly found in soil and moist environments; however, Ralstonia pickettii is rarely isolated from clinical specimens. Methods: A retrospective analysis was performed in the adult intensive care unit to evaluate of demographic profile, risk factors, associated comorbidities, and outcome of patients infected with R. pickettii October 2022 –November 2022. Results: We identified 17 patients with 18 distinct episodes of R. pickettii bacteremia from October 2022 till November 2022. Most cases had central venous catheter and haemodialysis catheter in situ. Renal replacement therapy was performed with most of the patients. Most of the patients had other comorbidities and coinfection with other micro-organisms. The mortality was high among this group but solely it could not be contributed to R. pickettii. As most of the patients had RRT and
Over the last ten months (December 2020 to October 2021), 75% of the population had an energy deficit (ED) and protein deficit (PD) of 8000 kcal and 300 grams respectively. Timely nutrition intervention can reduce complication rates, LOS in hospital, on the ventilator, and mortality rate. (Deane et al., 2018). Yeh et al., 2016 showed that the accumulation of >6000 kcal and/or >300 grams of PD within the first 14 days of stay was associated with increased LOS in ICU. Berger and Pichard et al, in 2012, demonstrated that a cumulative ED above 10000 kcal was associated with increased mortality. As seen in our study, with the implementation of NSP, we achieved a decrease in average ED and PD at ICU discharge compared to that on recruitment. Conclusion: Nutritional deficits in the ICU are a common factor in morbidity and mortality. Early catch-up and match-up may help in reducing these and may decrease mortality.

References


Estimation of Effect of Vaccination in Critically Ill COVID-19 Patients, Analysis Using Propensity-Score Matching

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Introduction: Vaccination has reduced the mortality and disease severity due to COVID-19. The effect of vaccination on intensive care unit (ICU) mortality is not well studied. This study aimed to assess the effect of vaccination on ICU mortality by propensity-score matching. Objective: To estimate the effect of vaccination on ICU mortality in critically ill COVID-19 patients. Materials and methods: This study was conducted from 15 June 2020 to 31 December 2021. Inclusion criteria were non-vaccinated and vaccinated patients who developed COVID-19 requiring ICU admission. The institutional ethical committee approval was obtained (IEC 131/2020, 149/2021 CTRI/2020/06/025858, 2021/07/034587). The primary outcome was ICU mortality. The average Body Mass Index (BMI) was 25.46 kg/m² + 5.51. About 63.68% of the patients had comorbidities. The patients had an average NRS score of 3.35 and a NUTRIC score of 3.80. We compared the LOS in ventilator, ICU, hospital, and mortality with respect to energy deficit (ED) and protein deficit (PD) of 8000 kcal and 300 grams respectively. The average ED and PD on recruitment were 2129 kcal and 104.63 g respectively. With the implementation of NSP, we achieved an average ED and PD of 1858 kcal and 85.7 g respectively on ICU discharge. About 13 participants had an ED ≥8000 kcal with a mortality of 46% compared to 21.1% (42 participants) in ED of <8000 kcal (p:0.037). Similarly, 31.25% of patients with a PD of >300 g died as compared to 21.1% (p > 0.05). LOS in the ICU, hospital, and on the ventilator was statistically different between 2 groups of ED >8000 kcal vs <8000 kcal as well as PD of 300 g (p < 0.05). Discussion: Timely nutrition intervention can reduce complication rates, LOS in hospital, on the ventilator, and mortality rate. (Deane et al., 2018). Yeh et al., 2016 showed that the accumulation of >6000 kcal and/or >300 grams of PD within the first 14 days of stay was associated with increased LOS in ICU. Berger and Pichard et al, in 2012, demonstrated that a cumulative ED above 10000 kcal was associated with increased mortality. As seen in our study, with the implementation of NSP, we achieved a decrease in average ED and PD at ICU discharge compared to that on recruitment. Conclusion: Nutritional deficits in the ICU are a common factor in morbidity and mortality. Early catch-up and match-up may help in reducing these and may decrease mortality.

References


Match up and Catch up the Deficit to Zero by the Nutritional Stewardship Program

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Introduction: Many critically ill patients are malnourished at presentation or develop it during hospitalization. Energy deficit (ED) and Protein deficits (PD) in Intensive Care Unit (ICU) are linked to poor hospital outcomes. Aim and objectives: To reduce the ED/ PD with the Nutrition Stewardship program (NSP) by a catch-up and match-up protocol and their impact on mortality and morbidity. Materials and method: Over the last ten months (December 2021–October 2022), 212 adult ICU patients who were on enteral and or parenteral nutrition were included in the study on day 3 of ICU admission. The Patient was screened with Nutritional Risk Screening (NRS) tool and NUTRIC (Nutrition Risk In Critically Ill) tool on admission to ICU. A Nutritional prescription was formulated and targets met were monitored daily. ED/PD were identified due to various feeding barriers. Nutrition reassessment was carried out every third day of patient selection to catch up and match up the deficits. Patients were followed up till ICU discharge and data with respect to the Length of stay (LOS) on the ventilator, ICU stays and mortality was collected. Results: Out of 212 patients recruited from December 2021 to October 2022, 75% of the population had an age above 50 years. Two third of the study participants were male. The average Body Mass Index (BMI) was 25.46 kg/m² + 5.51. About 63.68% of the patients had comorbidities. The patients had an average NRS score of 3.35 and a NUTRIC score of 3.80. We compared the LOS in ventilator, ICU, hospital, and mortality with respect to energy deficit (ED) and protein deficit (PD) of 8000 kcal and 300 grams respectively. The average ED and PD on recruitment were 2129 kcal and 104.63 g respectively. With the implementation of NSP, we achieved an average ED and PD of 1858 kcal and 85.7 g respectively on ICU discharge. About 13 participants had an ED ≥8000 kcal with a mortality of 46% compared to 21.1% (42 participants) in ED of <8000 kcal (p:0.037). Similarly, 31.25% of patients with a PD of >300 g died as compared to 21.1% (p > 0.05). LOS in the ICU, hospital, and on the ventilator was statistically different between 2 groups of ED >8000 kcal vs <8000 kcal as well as PD of 300 g (p < 0.05). Discussion: Timely nutrition intervention can reduce complication rates, LOS in hospital, on the ventilator, and mortality rate. (Deane et al., 2018). Yeh et al., 2016 showed that the accumulation of >6000 kcal and/or >300 grams of PD within the first 14 days of stay was associated with increased LOS in ICU. Berger and Pichard et al, in 2012, demonstrated that a cumulative ED above 10000 kcal was associated with increased mortality. As seen in our study, with the implementation of NSP, we achieved a decrease in average ED and PD at ICU discharge compared to that on recruitment. Conclusion: Nutritional deficits in the ICU are a common factor in morbidity and mortality. Early catch-up and match-up may help in reducing these and may decrease mortality.

References

secondary outcome was the length of ICU stay and duration of mechanical ventilation. We used propensity-matched analysis and logistic regression analysis to adjust for the confounding variables in vaccinated and unvaccinated groups. Statistical analysis was done using STATA™ (Version 14, College Station TX). The continuous variables were represented as mean (standard deviation SD) or median (interquartile range IQR) for parametric and non-parametric data. The categorical variables were presented as (%) percentages. The unmatched analysis was performed by the “Student’s t-test” or “Mann-Whitney U” test as applicable and the Chi-squared test for categorical data. P value <0.05 was considered statistically significant. For propensity-matched analysis, kernel density plots before and after matching were plotted. We used treatment effects by propensity-score matching for the analysis. Results: A total of 841 patients were included in the analysis, among which 667 (79.31%) were non-vaccinated and 174 (20.68%) were vaccinated patients. The mean age was 57.11 (standard deviation SD 15.13), and predominantly male patients (70.27%). The ICU mortality was 56.60%. The parameters which were found significant in the univariate analysis and of clinical importance were selected as the covariates for further analysis. In logistic regression analysis vaccination status, age, acute physiology, and chronic health evaluation (APACHE II score), the need for invasive ventilation support and the use of steroids were significantly different between the survivors and non-survivors. The propensity- matched analysis for the effect of vaccination was performed. The results of both multiple variable logistic regression and propensity matching method showed that the patients who were vaccinated were less likely to be associated with mortality (adjusted odds ratio, 95% C.I.: using logistic regression: 0.52 (0.29, 0.94), for propensity-score matching: 0.83 (0.77, 0.91). While comparing the estimations the propensity matching method had a lower standard error and a narrower confidence interval than multiple variable logistic regression. Conclusion: The results of the study showed among the vaccinated critically ill COVID-19 patients ICU mortality was significantly lower by the propensity-matched analysis. This is one of the few studies from India describing the effect of vaccination on critically ill patients. The findings of this study support COVID vaccination as an effective method for reducing case fatality not only in the general population as well as in critically ill patients and has important public health implications. Conflicts of interest: There are no conflicts of interest. Grant Acknowledgement: This was an investigator initiated study and no funding was involved.

References


Mortality Rate in the Off-hour ICU Admission: Our Experiences in Tertiary Care Hospital

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Background: The mortality rate in association with ICU admission timing is controversial in many studies. The imbalance between ICU staffing and medical resources during off-hours possibly influences the outcome for critically ill or injured patients. Here, we aimed to evaluate the association between ICU admission during off-hours and office hours mortality rate in a tertiary care hospital. Methods: This study was an observational study in a tertiary care hospital. We enrolled adult patients admitted to ICUs from November 2020 to May 2022. Exclusion criteria were patients with elective surgery, readmission to ICUs, and ICU admissions only for medical procedures. We compared mortality rates in ICU patients admitted during off-hours and office hours, using a multilevel logistic regression model which allows for the random effect. Results: A total of 1620 patients were enrolled with a median age of 68 years (interquartile range [IQR], 56–78). The median APACHE II score was 16 (IQR, 11 to 22) with no significant difference between patients admitted during off-hours and those admitted during office hours. The in-hospital mortality was 168/956 (17.57%) when admitted during off-hours and 147/664 (22.13%) when admitted during office hours. Thus, off-hours ICU admission was associated with lower in-hospital mortality (adjusted odds ratio 0.90, [95% confidence interval, 0.83–0.98]). Conclusions: ICU admissions during off-hours were associated with a lower mortality rate in comparison to office hours in a tertiary care hospital. It might be possible due to an imbalance between ICU staffing and workload during office hours. Further larger sample size study may be required for more conclusive results.

References


Clinico-demographic Profile of Vaccinated vs Non Vaccinated COVID 19 Cases in Second Wave in India

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Background: As of 20 November 2021, 29.1% (40.1 crores) of the population have been completely vaccinated while 55.6% (76.6 crores) of the population have received at least one dose of vaccine. Infection despite vaccination (vaccine breakthrough) has been reported, but characteristics of this infection regarding the clinical demographic profile, severity of disease, and mortality in the fully vaccinated, partially vaccinated, and not vaccinated groups are not well described, during the second COVID-19 wave in India from April to June 2021 when the highly transmissible Delta variant predominated. Methods: Vaccination status, CT scoring, RT PCR reports, and biomarkers like CRP, D-Dimer, and IL-6 were recorded. Statistical analysis was done using Epi info version 7.2.1.0 statistical software. The study was approved by the institutional research and ethical committee. Results: There are 182 COVID patients who received only one dose, 24 were fully vaccinated and 24 were unvaccinated. Unvaccinated patients were younger than vaccinated people (p < 0.001) CT severity scoring was relatively higher in unvaccinated patients as compared to vaccinated patients. (p = 0.003). About 92.3% of our vaccinated patient group were treated on OPD basis while in unvaccinated patients 41.7% required hospitalization. Biomarkers (CRP, D-Dimer, and IL-6) were also deranged to a lesser severity among vaccinated and partially vaccinated study populations as compared to unvaccinated individuals. The death occurred in 8.3% of unvaccinated patients and only 1.1% of partially vaccinated patients, while no mortality occurred in fully vaccinated patients. Conclusion: We can conclude that vaccines play a critical role in preventing serious COVID-19 illness and remain highly effective in preventing COVID-19 hospitalizations and the biomarkers (CRP, D dimer, IL-6) can be used in the risk stratification of covid
ABSTRACTS CRITICARE – IJCCM2023

19 infections. Keywords: Bio markers, CRP, D dimer, Delta variant, Hospitalisations, IL-6, Second COVID-19 wave in India, Vaccine breakthrough infections.

Perception- and Practice-based Survey amongst Intensivists in India on the Effectiveness and Tolerability of Ceftriaxone–Sulbactam-Disodium Edetate When Used as Antibiotic Coverage or for the Treatment of Secondary Bacterial Infections in Hospitalised/Intensive Care Unit-Admitted Patients with Coronavirus Disease 2019

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Infections and prevention: Introduction: Severe SARS-CoV-2 virus infection may lead to prolonged hospitalization. These patients are at higher risk of developing secondary bacterial infections. This may increase the risk of morbidity and mortality. The selection of appropriate antibacterial therapy is crucial in the treatment of these infections. Objectives: The objective of the survey was to record the perceptions of intensivists across India on the effectiveness and tolerability of ceftriaxone sulbactam disodium edetate (CSE) when used as antibiotic coverage or for the treatment of secondary bacterial infections in hospitalized/ICU-admitted patients with COVID-19 infection. Materials and methods: A structured, self-reported survey questionnaire was developed in the English language, comprising sixteen questions. The survey responses were captured by providing multiple choices for the respective questions. Also, open-ended descriptive comments were recorded. The options from multiple choice were selected based on the opinion of intensivists and on the prescribing practices in ICUs in India. Results: The survey reported the prevalence of 15–30% of secondary infections in hospitalized/ICU-admitted COVID-19 patients as diagnosed by culture tests, biomarkers, clinical signs, hematological tests, and radiological tests. Klebsiella, Pseudomonas, and Acinetobacter were the common pathogens causing secondary bacterial infections in patients with COVID-19 infection. The survey results showed that 89.61% of intensivists used antibacterial coverage in the case of hospitalized/ICU-admitted patients with COVID-19 infection. However, the deciding factors for such use were the severity of COVID-19 infection, radiology and blood biomarkers, local antibiotic, recent antibiotic therapy, and comorbidities of the patients. Beta-lactam/beta-lactamase inhibitors (BL/BLIs) were used by 57.14% of intensivists, thereby sparing the carbapenems (5.19%). A minimum of 69% and a maximum of 89.61% of intensivists preferred to use CSE as antibiotic coverage in hospitalized/ICU-admitted COVID-19 patients. Conclusion: The survey showed that most of the intensivists used antibiotic coverage and had experienced the use of CSE for the treatment of secondary bacterial infections in hospitalized/ICU-admitted patients with COVID-19 infection. However, the choice of antibiotic therapy was guided by local antibiogram and various other factors. Further, studies are needed to evaluate the efficacy and safety of CSE in this population. Keywords: Antibiotic coverage, Ceftriaxone, COVID-19, Disodium edetate, ICU, Secondary infections, Sulbactam.

References

Complicated Case of Mandelson Syndrome

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Objective: The positive outcome in a patient of Mandelson syndrome with ARDS, ventilator-associated pneumonia (VAP) and prolonged invasive mechanical ventilation. Methodology: A single case report. Introduction: Mandelson’s syndrome is characterized by a bronchopulmonary reaction following aspiration of gastric contents during general anesthesia due to the abolition of the laryngeal reflexes. The main clinical features are signs of general hypoxia, two to five hours after anesthesia. According to Salik I, Doherty tm at al incidence is 0.15%, and death with Mandelson syndrome is 0.0045%. Results: A 24-year-old male came to the hospital with h/o post-burn contracture over the chest, both upper arms, and left thigh which he had since 8 months and needed corrective surgery. He was posted for elective plastic surgery. The patient was desaturated during intubation and developed a can’t intubate can’t ventilate condition so an emergency tracheostomy was done and the airway got secured, the procedure was abandoned and then the patient was transferred to the surgical ICU. On arrival to the ICU patient was on a ventilator with MODE PCV VT = 400mL, FIO2 = 100%, PEEP = 8 cm H2O, RR = 18, SPO2 = 100% under sedation and paralysis. Vitals were temperature afbeirle pulse rate = 105/min RR = 18 blood pressure = 120/70 mm of mercury RBS = 136 mg/dL SPO2 = 96% ABG shows uncompensated high anion gap metabolic acidosis. X-ray chest suggestive of bilateral homogenous opacities possibility of Mandelson’s syndrome (aspiration pneumonia). On day 4 patient HRCT chest showed bilateral pleural effusion with an ARDS picture. On day 10 ET tube culture report showed growth of klebsiella.
pneumonia which is sensitive to linezolid and meropenem and on day 18 bronchial secretion from the lower airway report showed growth of Acinetobacter species and growth of pseudomonas which is sensitive to colistin. The patient was treated as per the blood culture and sensitivity report with appropriate antibiotics and kept on the invasive mechanical ventilator from day 3 to day 8 with the setting of MODE CPAP VT = 480, FIO\(_2\) = 100%, PEEP = 5 cm H\(_2\)O, RR = 18, SPO\(_2\) = 100%, 9 to 12th day MODE SIMV + pressure support VT = 480, FIO\(_2\) = 60%, PEEP = 5 cm H\(_2\)O, RR = 18, SPO\(_2\) = 100%, 12th to 17th MODE CPAP FIO\(_2\) = 40%, PEEP = 5 cm H\(_2\)O, RR = 18, SPO\(_2\) = 100%, 18th day SPO\(_2\) = 99% with 10 liters of oxygen, 19th to 22nd SPO\(_2\) = 96% with 4 liters of oxygen, 23rd to 25th SPO\(_2\) = 96% on room air on thermovent. Serial chest X-ray showed improvement and ABG was normal. The patient was treated with appropriate antibiotics, and nutrition support and shifted to the ward after weaning from mechanical ventilation. On the 26th day, he was decannulated. Later he got discharged. Discussion: This case report can give a direct impact on airway management and treatment of complications of Mandelson syndrome with invasive prolonged mechanical ventilation, appropriate antibiotics, and nutrition with other supportive management.

References


Clinical Profile and Outcome in Patients with Community Acquired Pneumonia Requiring ICU Admission: A Prospective Study

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Background: Sparse published data are available from south India regarding etiology, clinical profile, and outcome in community-acquired pneumonia (CAP) requiring ICU admission. Aim: To study the etiology, clinical presentation, and predictors of outcome in patients presenting with CAP requiring ICU admission at our tertiary care teaching hospital. Material and methods: There are 93 consecutive adult patients admitted to ICU with CAP were prospectively evaluated during the period of January 2018 to June 2019. Results: Their mean age was 54 ± 15 years, and males (57%) outnumbered females. Fever (97%) was the predominant symptom followed by cough (97%), breathlessness (92%), and chest pain (13%). Sepsis and septic shock were seen in 54% and 16% respectively. Of the total 93 patients, a single aetiological agent was found in 40% and no aetiological agent was identified in 27% of patients, remaining patients’ multiple aetiologies were identified. Among 37 patients with single etiology, 12 had influenza, 9 had Legionella pneumonia and 8 had Staphylococcus aureus pneumonia. 62% of patients required NIV, and of them, 34% failed NIV and required invasive mechanical ventilation. Out of 93 patients, 30% required mechanical ventilation and 17% of patients expired. On receiver-operator characteristic curve (ROC) analysis, Pneumonia Severity Index (PSI) score >98 (Area under the curve (AUC) = 0.672, p = 0.04), had predicted death with a sensitivity of 69% and specificity of 73%. On multivariable analysis need for invasive mechanical ventilator support (p < 0.001) emerged as an independent predictor of death. Conclusion: Community-acquired pneumonia can be caused by single or multiple concurrent etiology. The need for mechanical ventilator support is an independent predictor of death in patients admitted to the ICU with CAP.

Poisoned Chalice – Acyclovir in Varicella Zoster Infection

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Objectives: To attribute the cause of altered behavior in varicella infection – Acyclovir induced Encephalopathy or Herpes Zoster Encephalitis. Introduction: Patients present to ER with various causes of encephalopathy, drug-induced being one of the most common causes. This diagnosis becomes difficult at times like in varicella infections as differentiating zoster encephalopathy from acyclovir neurotoxicity is challenging. Zoster encephalopathy should improve with acyclovir, while drug-induced neurotoxicity will get worse if the drug is continued. Renal toxicity of acyclovir adds up to the differential diagnosis. All this creates a dilemma in the management of the condition. CSF analysis and MRI is needed to assist in the diagnosis. Varicella Zoster Encephalitis occurs due to the reactivation of VZV after being dormant in ganglionic neurons, which presents commonly as shingles, post-herpetic neuralgia, and vasculopathy. Rare presentations include encephalitis, myelopathy, and cerebellitis. Acyclovir is a nucleotide analog antiviral used to treat herpes zoster, it inhibits the action of viral DNA polymerase and DNA replication of different herpesvirus. Acute renal injury with or without crystalluria, and neurotoxicity are complications associated with it. Neurotoxicity due to acyclovir is seen more in conjunction with renal impairment and Speech difficulties and visual hallucinations are common. A 56-year-old female presented to the hospital with nominal aphasia and altered behavior since the morning of the day of the presentation. On examination, no other focal deficits were found. She had a history of fever associated with a vesicular rash over the left temporal and ear 4 days ago. Medical help was sort and treatment was started for VARICELLA ZOSTER infection with TAB.ACYCLOVIR 800 MG /PO/ 5 TIMES A DAY. MRI BRAIN, renal function tests and CSF were sent for analysis in the hospital. Renal impairment was present without oliguria, and the rest investigations showed a normal study. Acyclovir was withheld. Outcome: The patient recovered well after discontinuation of acyclovir, both from neurotoxicity, and nephrotoxicity which confirmed the diagnosis of the drug (acyclovir) induced encephalopathy.

A Curious Case of Hypokalemic Periodic Paralysis in a Patient with Dengue Fever

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Hypokalemic periodic paralysis can be due to pre-existing channelopathies with a superimposed insult, like a viral infection. Here we present a male patient with a history of Rheumatoid arthritis on Etanercept SOS who presented with fever and rigor along with sudden paresis of all 4 limbs with potassium of 2 Eq/L. He was diagnosed with Dengue fever and recovered subsequently and was discharged home.

**Contactless Blood Pressure Monitoring Utilizing Ballistocardiography Based Microvibrations**

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Blood pressure (BP) is an essential short- and long-term biomarker in healthcare. According to India’s Ministry of Health & Family Welfare, hypertension resulted in 1.6 million casualties in 2016, with the number expected to rise [1]. Hence emphasis has been placed on improving the accuracy and frequency of BP monitoring. The gold standard BP measurement is the invasive arterial BP (IBP), which is only performed in selected patients in intensive care units (ICUs) [2]. The gold standard non-invasive cuff-based oscillometric BP (CBP) readings are infrequent and its accuracy is operator dependent[3]. Recently, a combination of electrocardiography and plethysmography derived BP has gained popularity, primarily outside of healthcare settings, and clinical accuracy is being evaluated [4]. Fundamentally, there is a need for continuous reliable BP readings that are comfortable for the patient and easy to acquire for clinicians. BP trends and frequent monitoring would have value in early warning scoring and timely intervention for decompensating patients. This work presents initial clinical findings of a novel vitals monitoring system, Dozee, for measuring Non-Contact BP (NcBP). This system utilizes Ballistocardiogram (BCG) micro-vibration signals to estimate changes in systolic and diastolic BP. With a built in calibration model, this system can represent the absolute value of BP as well. This device consists of piezoelectric sensors spread across a sheet that when placed under the patient’s mattress, measures the micro and macro body vibrations caused by cardiac contractions, lung expansion, diaphragmatic movement, and other factors. A clinical study is being conducted across two sites where Dozee and proprietary algorithms are used to validate Dozee’s NcBP against the gold standard IBP and standard of care CBP. Results from an interim analysis of 35 subjects are being presented. The machine learning model was trained using data before CPAP.

Before CPAP
from 12 subjects. One subject data was rejected for IBP data quality issues. To avoid bias, only data from the remaining 22 subjects were analyzed for accuracy. Over 22,600 discrete IBP data points were collected, with 8085 for systole and 8088 for diastole passing quality checks and being used in the analysis. 507 data points were collected for CBP comparison, with 141 points being used for analysis. In comparison to IBP, the Dozee had a Mean Absolute Error (MAE) of 8.1 mmHg and 4.43mmHg for systolic BP and for diastolic BP respectively. Dozee achieved an MAE of 9.3 mmHg for both systole and diastole when compared to CBP. CBP readings were also compared to IBP, with CBP achieving a MAE of 8.3 mmHg and 7.2 mmHg for systolic BP and diastolic BP respectively. The initial data set ranged from 65-192 mmHg for systole and 37-102 mmHg for diastole. More research and analysis are required to establish any specific correlation or superiority claims. According to this research, the Dozee has the potential to provide clinical-grade continuous blood pressure readings in a contactless and automated manner.

References

RECURRENT ATRIAL FIBRILLATION WITH UNTREATED OBSTRUCTIVE SLEEP APNEA

Recurrent Atrial Fibrillation With Untreated Obstructive Sleep Apnea
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Obstructive Sleep Apnea (OSA), a common and underdiagnosed condition, causes partial or complete collapse of upper airways during sleep leading to recurrent episodes of hypopnea and apnea. OSA has significant cardiovascular implications particularly arrhythmias. The incidence of atrial fibrillation (AF) is 88% higher in patients with OSA. Untreated OSA significantly contributes to recurrence of AF after cardioversion. Here, we present a case of a 49-year-old male patient with a history of hypertension for...
The prevalence of COPD is around 7% in India. In the emergency department, 3,546 patients, the mean ± SD age was 66.84 ± 11.56 years; 40% were female subjects. Invasive ventilation was associated with significant nocturnal desaturations and later hypotension requiring vasopressor support. He was given a trial of overnight continuous positive airway pressure (CPAP) after which there was no recurrence of atrial fibrillation. Later on, the sleep study revealed moderate to severe extrathoracic upper airway obstruction. With regular overnight CPAP, vasopressors were stopped, he had normal sinus rhythm and was discharged with the prescription of CPAP at night. In OSA, atrial remodeling, diastolic dysfunction, increased autonomic tone, inflammatory mediators and hypertension amplify the risk of atrial fibrillation. CPAP is the treatment of choice for OSA which may have antiarrhythmic effects. This case emphasizes that patients at risk should be screened for OSA early on in the course when considering possible interventions for atrial fibrillation.

Comparison of Predicted Outcomes Based on Non-Invasive Ventilation Outcome (NIVO) Score with Observed Outcomes in Patients of Chronic Obstructive Pulmonary Disease in Acute Hypercapnoeic Respiratory Failure and Treated with Non-Invasive Ventilation.

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Introduction: The prevalence of COPD is around 7% in India. Acute exacerbations of COPD (AECOPD) is complicated by acute hypercapnic respiratory failure (AHRF) and frequently requires ventilation. Non-invasive ventilation substantially reduces mortality in such patients. NIVO score has been devised to predict difficult airway, particularly in trauma. Material and methods: This is a prospective observational study. COPD patients with acute hypercapnic respiratory failure admitted consecutively to Fortis hospital, NOIDA, UP over a period of 8 months from 1st April to 5th December and treated with NIV were enrolled in the study. Results: About 25 patients were recruited, the mean ± SD age was 66.84 ± 11.56 years; 40% were female subjects. Invasive ventilation was needed in 9/25 patients. There was a significantly higher mean NIVO score in patients needing invasive ventilation vs those managed only with NIV (3.22 vs 1.13, \(p = 0.00114\)). Only 1 patient died during the index admission (NIVO score 5), and 1 patient (NIVO score 2) died 15 days after discharge from COVID-19 infection. The 3rd patient (NIVO score 4) needed further readmission twice before dying 6 months later. Discussion: Our study is an ongoing study and the data presented here are only from the first 25 patients recruited. The patients who died during the index hospitalization or at 6 months had high NIVO scores. We still need data from a larger number of patients for comparison with predicted mortality from NIVO scores. We found a significantly higher NIVO score in patients requiring invasive ventilation vs those who did not. NIVO score can help in predicting prognosis and early escalation of the level of care.

References

To Implement an Innovative and Easy Score – The Bruth Score to Predict Difficult Airway

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Background and objective: In the emergency department (ED), airway management is often abruptly required and unpredictable. Airway assessment is crucial for emergency physicians because identifying patients with difficult airways allows for more careful intubation and early expert consultation. It could increase intubation failure rates, particularly in airway trauma and result in adverse events esophageal intubation, aspiration, hypoxemia, hypotension, dysrhythmia, and even cardiac arrest. Airway assessment should utilize multiple components to increase their usefulness; however, airway tests even in combination are not diagnostic. Several univariate and multivariate scoring systems have been produced, including the Mallampati score, Wilson Score, MTAC, and the Simplified Airway Risk Index (SARI). It is not fully known if using several individual tests in an unspecified manner is less predictive than structured objective scoring systems. The objective of this study is to implement an innovative and easy score – The BURTH score to predict difficult airway, particularly in trauma. Material and
methods: This is a prospective observational study conducted among 200 patients in the ED of AIMS, Kochi, for 6 months. All conscious adult patients were included in the data. The data include five predictors: retrognathia, inability to bite the upper lip with the lower incisors (upper lip bite test), short hyomental distance, short thyromental distance, and body mass index >25. These predictors were compared against the Mallampati score to calculate sensitivity. Results and observation: Among the 200 patients, 82 patients have a Mallampati score of 3,4. The incidence of a difficult airway according to Mallampati’s score is 41%. The sensitivity of the new score is 82.9%. As per the new innovative score, a single positive parameter itself will predict a difficult airway in ER with a sensitivity of 82.9% taking the Mallampati score as the gold standard for predicting a difficult airway. Conclusions: As per this study the new innovative score, even a single positive parameter itself will predict a difficult airway in ER with a sensitivity of 82.9% taking the Mallampati score as the gold standard to predict a difficult airway. This score includes five predictors that help emergency healthcare professionals quickly identify and carefully manage patients with difficult airway.

Table 1: The BURTH Score

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Condition</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>&gt;25</td>
<td>1</td>
</tr>
<tr>
<td>Upper lip bite test</td>
<td>Unable to do</td>
<td>1</td>
</tr>
<tr>
<td>Retrognathia</td>
<td>Present</td>
<td>1</td>
</tr>
<tr>
<td>Thyromental distance</td>
<td>&lt; 3 finger width or &lt; 7 cms</td>
<td>1</td>
</tr>
<tr>
<td>Hyomental distance</td>
<td>&lt;6 cms</td>
<td>1</td>
</tr>
</tbody>
</table>

Minimum score: 0; Maximum score : 5
The total score of ≥1 is considered as positive and the total score of >1 is considered as negative.

Handheld Doppler to Improve Pulse Check in Cardiac Resuscitation

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Keywords: Cardiac arrest, Critical care, Doppler, Emergency medicine. Introduction: The difficulty of determining pulselessness via manual palpation in cardiopulmonary resuscitation (CPR) has been well-documented in the literature. Therefore, to assess possibilities for improving the detection of the return of spontaneous circulation during in-hospital resuscitation, we conducted a prospective case series during which handheld Doppler pulse checks were performed in parallel with standard ACLS procedures during resuscitation of adult patients. Objectives: To examine the effectiveness of a Handheld Doppler to enhance the pulse check during cardiac arrest. Methods: This is a prospective case series performed on 30 patients who had suffered in-hospital cardiac arrest (IHCA) at Amrita Institute of Medical Sciences, Kochi. Patients above 18 years of age who suffered in-hospital cardiac arrest (IHCA) were included in the study. Patients younger than 18 years of age, traumatic cardiac arrest, pregnant women, and out-of-hospital cardiac arrest were excluded. The optimum size for a doppler pulse check was identified as a lower left parasternal region. For included subjects, audible Doppler pulse checks were done in addition to standard ACLS procedures simultaneously with manual pulse checks. The time taken for recognition of spontaneous circulation by each method was recorded and compared. Results: Among 30 patients, 18 patients attained return of spontaneous circulation (ROSC) while 12 patients could not be revived. Resuscitation in every patient was done as per ACLS protocol and a manual pulse check took an average of 4.6 seconds in recognising the carotid pulse. In comparison, a handheld doppler took an average time of 3.4 seconds in detecting the return of spontaneous circulation. Conclusion: The study results suggest that during attempts at in-hospital resuscitation, standard manual pulse checks frequently lag behind the Doppler in recognition of the return of spontaneous circulation. The addition of a portable Doppler to resuscitation efforts may enhance the accuracy of manual pulse checks. Discussion: The portable Doppler pulse check is a useful and simple intervention that may aid in the assessment of pulsatility in a reliable and timely manner. Using a handheld doppler device doesn't require any special training and is also cost-effective. Pulse check in cardiac arrest is subjective and hence while using doppler, ROSC can be confirmed, my multiple rescuers. The incorporation of Doppler pulse checks could prevent the premature termination of resuscitation efforts due to a falsely negative manual pulse check. Doppler is also very useful in situations where necklines, a short neck, or burns can make it difficult to assess the carotid artery site for a pulse check. Technical issues, equipment failure, and anatomical or pathological heart location variations are downsides of this method. More research with a larger sample size is needed to determine whether Doppler pulse checks could be a useful addition to future in-hospital resuscitation algorithms.

A Case of Noonan Syndrome Presenting as Type-II Respiratory Failure

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Introduction: Noonan syndrome is an autosomal dominant, multisystem disorder characterized by a facial deformity, cardiovascular abnormalities, malformation of the skeletal system, blood vessels, lymphatics, coagulation defect, pleuropulmonary abnormalities, learning disabilities, and genitourinary abnormalities. The five most commonly involved genes are PTPN11 (50%), SOS1 (10–13%), RAF1 (5%), RIT1 (5%), and KRAS (less than 5%). Its prevalence is reported as 1 in 1000–2500. Case: A 44-year-old female presented to BLKH ER with shortness of breath. There was no history of fever, cough, or chest pain. On evaluation, she was found to be hypotensive, tachypnoeic with BP-88/55 mm Hg, HR-98/min, SPO2-96% on room air, RR-22-28 breaths/min. On auscultation bilateral Rorchi were found. Investigation showed Hb-8.6 gm/dL, TLC-21700/mm3, Platelet-342000/mm3, Troponin I negative, procalcitonin-0.36, COVID-19 Antigen-negative. ECG, kidney function test, and liver function test were normal. ABG showed respiratory acidosis with pH-7.20, PCO2-80, PO2-61, HC03-32.4, and lac-0.5. Chest X-ray showed bilateral infiltrates. CT thorax showed few patches of consolidation in bilateral lobes,
mild bilateral pleural effusion, and septal thickening with mild bronchial wall thickening in bilateral lung fields. 2D Echo showed no RWMA with LVEF-55%, normal cardiac chamber dimension, mild MR, trace AR, trace TR, PASP-36 mm Hg, TAPSE-1.8 cm. The patient was treated with IV Fluid, NIV support, piperacillin-tazobactam, clindamycin, methylprednisolone, enoxaparin, nebulization with levosalbutamol, terbutaline, and budesonide. The patient responded well to the given treatment and was discharged in stable condition. Discussion: Cardiac anomalies are common in this disease with Noonan syndrome being the second most common cause of congenital heart disease. The most common cardiac abnormalities are pulmonary stenosis (50–60%), hypertrophic cardiomyopathy (20%), and discordant atrial septal defect (6–10%), but ventricular septal defect, peripheral pulmonary stenosis, atriocaval and aortic valve abnormalities, aortic coarctation, and coronary artery anomalies have also been noted. But our patient did not have any such cardiac abnormalities. PASP-36 mm Hg suggested pulmonary artery hypertension in our patient. The incidence of pulmonary hypertension has been reported to be 13%. The incidence of spine deformity has been reported to be 30%. Our patient had a webbed neck, scoliosis, and crowding of ribs suggesting chest wall deformity accounting for restrictive lung disease leading to type II respiratory failure. Conclusion: Although cardiovascular anomalies are common in Noonan syndrome patients can present with respiratory symptoms even in absence of these abnormalities because of skeletal and chest wall deformities which cause restrictive lung disease.

References
7. https://www.ahajournals.org/doi/abs/10.1161/circ.146.suppl_1.15551#d10679791e1

A Retrospective Analysis on the Practice and Impact of Use of Hemoperfusion Therapy in Septic Shock in Tertiary Care Centre

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Introduction: Septic shock, a subset of sepsis leading to circulatory, cellular, and metabolic abnormalities and is associated with mortality greater than 40–50%. In Refractory septic shock, high doses of vasopressor support (Noradrenaline >0.5mcg/kg/min) are required in spite of standard strategies, with mortality reaching 90–100%. Adjuvant Hemoperfusion (HP) therapies have shown some benefits. Objectives: To analyze the impact of Hemoperfusion therapy in septic shock, in regards to mortality, time to initiation of HP, and changes in vasopressor support. Material and methods: After ethical clearance from the hospital committee, all Electronic Medical records were accessed from ICU Adult patients from January 2020 to July 2022, to identify Septic patients in whom HP was used. Demographic variables collected: Age, Sex, Comorbidities, Source of sepsis, Inflammatory markers- Interleukin-6, procalcitonin, C-reactive protein, vasopressor

Phase A: Adapative immune response, ECT likely harmful
Phase B: Cytokine storm, likely maximal benefit from ETC
Phase C: Counteractive anti-inflammatory arm restoring immune behavior, ECT likely harmful

Hypothetical immune response beyond which the process becomes counterproductive

Likely a tip-over point beyond which any cytokine removal therapy might be counterproductive

Theoretical considerations of the likely impact of extracorporeal therapy (ECT) in sepsis
support, the timing of initiation and duration of HP, Number and type of filter used, Patient severity index – APACHE II score and SOFA Scores were also collected as outcome data concerning Length of ICU and Hospital stay. **Results:** About 69 patients were analyzed who required HP, of which 59% were male and 41% female patients, having a mean age of 59.71 ± 15.71 years. More than >50% of these patients had Diabetes and Hypertension, whereas Chronic liver and kidney disease was seen in 25% of this group. The predominant source of sepsis in these patients was intra-abdominal infections 60% with 30% respiratory tract infections. All these 69 patients had developed refractory septic shock requiring more than two vasopressor support besides ventilatory and renal replacement therapy. Devices used for HP aimed for removing cytokine or endotoxin was Cytosorb used in 77% of patients, 36% Hemofeel used in 36%, and Toray was used in only 8% of these patients. The mean time to initiate HP therapy from the onset of shock was 94.25 ± 121.71 hours with a mean duration of 39.35±29.29 hours in all patients. The average APACHE II score was 19, with a SOFA score of 8.7 on admission. Only 9% of refractory septic shock patients survived, with a minimum of two filters used for a mean duration of 55 hours. HP was initiated within 54 hours of the onset of shock in survivors as compared to 98.2 hours in non-survivors. After 24 hours of HP therapy nearly 50% reduction in requirements of Vasopressor support was noted. **Discussion:** Sepsis mounting immune response has 3 phases. In Phase A and phase C, HP Therapy is harmful, while in phase B (with cytokines at maximum) cytokines removal by HP may benefit. Hence early use of HP therapy when initiated within 24–48 hours has shown survival benefits and reduction in vasopressors requirement in studies done by Mehta et al., and Rajib Paul et al. However, large multicentered randomized controlled trials may be helpful to define the optimum timing and outcome with the use of HP therapy. **Conclusion:** Adjunct therapy with hemoperfusion filters for Septic shock has shown survival benefits. However, the early initiation of the same may be the cornerstone of improved outcomes.

**References**


**CYP 450 2C19 polymorphisms and Its Association with Major Cardiac Events in Post Coronary Intervention Patients on Clopidogrel in the Tertiary Care Centre.**

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**Background:** Clopidogrel has become essential in managing coronary artery disease (CAD) and other atherothrombotic diseases. It is an inactive prodrug that needs biotransformation in the liver by various cytochrome p450 isoenzymes for its active metabolite formation. However, 4–30% of patients on clopidogrel have shown no or decreased anti-platelet response. This condition is called ‘clopidogrel non-responsiveness’ or ‘clopidogrel resistance.’ This is attributed to genetic heterogeneity causing interindividual variation and increased risk of major adverse cardiac events (MACE). This study aimed to assess major adverse cardiac events (MACE) and their association with CYP450 2C19 polymorphisms in post-coronary intervention patients on clopidogrel. **Methods:** This prospective observational study was conducted on acute coronary syndrome (ACS) patients, started on clopidogrel following coronary intervention. After considering inclusion and exclusion criteria, 72 patients were enrolled, and a genetic analysis was done. Based on genetic analysis, patients were divided into two groups, normal (CYP2C19*1) and abnormal phenotypes (CYP2C19*2 and *3). These patients were followed for two years, and MACE during 1st and 2nd year was compared between these two groups. **Results:** Out of 72 patients, 39 (54.1%) were normal, and 33 (45.8%) were abnormal genotypes. The mean age of patients is 67.71 ± 9.968. A total of 19 and 27 MACE events were seen during 1st and 2nd year follow-up. The primary outcome of MI was more in an abnormal phenotypic group than normal. During 1st year only 3 (9.1%) abnormal phenotype patients have STEMI (p-value = 0.183), NSTEMI in 3 (7.7%) normal and 7 (21.2%) abnormal phenotype patients (p-value = 0.19). Other events like thrombotic stroke, stent thrombosis, and cardiac deaths are seen in 2 (6.1%) abnormal phenotypic group patients (p-value = 0.401). During 2nd year NSTEMI was seen in 4 (10.3%) normal and 9 (29%) abnormal phenotypic groups (p = 0.045). Comparison of total MACE between normal and abnormal phenotypic groups at the end of 1st (p-value = 0.011) and 2nd year (p-value = <0.01) has statistical significance. **Conclusion:** We can infer that the risk of developing recurrent MI (STEMI and NSTEMI) and other MACE events during one and two years of post-PCI patients who are on clopidogrel is significantly higher in the abnormal phenotypic group (CYP2C19*2 and *3) than in normal patients.

**References**


Post-operative Pulmonary Complications After Major Abdominal Surgery: A Prospective Observational Study
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Objective: The primary objectives of this study were to find out the incidence of postoperative pulmonary complications (PPC) in patients undergoing major abdominal surgery and to find out the factors associated with the development of PPC after major abdominal surgery. Secondarily, we assessed and compared the ARISCAT and LAS VEGAS scores in predicting PPC. The impact of PPC on postoperative ICU stay, length of hospital stay, in-hospital and 30-day mortality was also studied.

Materials and methods: This prospective observational single-arm cohort study was conducted on 205 adult patients undergoing major abdominal surgery under general anesthesia or a combination of general and regional anesthesia. During the intraoperative period, the technique of ventilation (manual vs ventilator), ventilator settings, intraoperative hypotension (SBP<90 mm Hg for >3 mins) and desaturation (SpO2<92 % for >2 mins), and administration of unplanned vasoactive drugs were recorded. PPC were clinically observed and recorded daily from the day of surgery (day 0) until discharge from the hospital or until postoperative day 7, whichever came first. Each adverse pulmonary event was recorded daily, but only counted once in the composite score. Length of hospital stay and in-hospital mortality were determined from patients records or telephonically at postoperative day 30. Incidence was calculated by assessing how many patients who underwent major abdominal surgery developed PPC. LAS VEGAS and ARISCAT score was calculated. Results: The incidence of PPC was 26.83% (n = 55). The mean age was higher (46 ± 16.3 years vs 38 ± 15.4 years, p < 0.01) in the PPC group. The proportion of patients with co-morbidities was higher in the PPC group (69% vs 42%, p < 0.01). There was a significant difference between the pre-operative hemoglobin levels, pre-operative SpO2 levels, and pre-operative X-ray findings of the two groups. Type of surgery (elective vs emergency), anesthesia, and mode of intraoperative ventilation did not have any effect on the development of PPC. All patients in the PPC group had undergone open surgery. Significantly higher (45%) patients in the PPC group had intraoperative hypotension and required vasopressors as compared to 17% of patients in the no PPC group (p < 0.01). Patients in the PPC group had a longer duration of surgery (4.7 ± 2 hours vs 3.6 ± 1.5 hours p < 0.01), several days on the ventilator (2.9 ± 2.7 days vs 0.5 ± 1.2 days, p < 0.01) and longer ICU (4.8 ± 3.8 days vs 0.9 ± 1.8 days, p < 0.01) and hospital stay (9.7 ± 6.6 days vs 6.8 ± 3.0 days, p < 0.01). PPC were less frequent in patients who had been extubated at the end of surgery [118/136 (86.7%) vs 37/62 (59.6%) p < 0.01] as compared to those who required postoperative ventilation. In-hospital mortality was attributable to PPC in 23 out of 27 deaths (85%, p < 0.01). There was no difference in the 30-day mortality. ARISCAT score and LAS VEGAS score had a sensitivity (98.18%, 100%), specificity (13.33%, 0.67%) positive (29%, 26.96%), and negative predictive value (95.23%, 100%).
Passive Leg Raise Fluid Responsiveness In Critically Ill Patients With Hypotension Measured By Stroke Volume Index and Concomitant Carotid Blood Flow “A Prospective Observational Study”

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DOI: 10.5005/jp-journals-10071-24411.192

Objectives of the Study: Primary objective: To correlate the PLR fluid responsiveness in critically ill patients with hypotension as measured by stroke volume index (SVI) and concomitant carotid blood flow. To determine the threshold, increase in carotid blood flow on fluid responders. Secondary objective: To assess any correlation of carotid artery diameter with SVI in the study group. To assess the interobserver variability in carotid blood flow (CBF) measurements.

Materials and Methods: Study design: Prospective observational study. Study tool: Multiparameter monitor for measurement of hemodynamic variables, Portable Ultrasonography Machine-Mindray M7 premium., Automated Patient bed for PLR maneuver. Methodology: Information regarding hemodynamic measurements, carotid, and aortic doppler measurements both pre-PLR 1 MINUTE post-PLR will be done by two observers within 30 minutes. Carotid ultrasound images were obtained concurrently with SVI (LVOT) measures with the patient in the supine position. Repeat carotid ultrasound images and concurrent SVI measurements were then obtained within 1 min after PLR. Data Analysis: Collected data entered in EXCEL software and analyzed using IBM SPSS software version 16. Descriptive analysis, correlation with Pearson correlation and Intraclass correlation coefficient, and Blant Altman t-test for inter-observer variability was done. Results: The study population comprised 37 hypotensive hemodynamically unstable mechanically ventilated patients, including most medical cases and a few surgical cases. We found 16 (43.2%) patients were responders and 21 (56.8%) were non-responders on the observer 1 evaluation. On observer 2 evaluation, responders were 19 (51.4%) and non-responders were 18 (48.6%). In the Area under the curve (AUC) of Observer 1, the percentage change in CBF is fair with 0.762 (95% confidence interval [CI] – 0.596–0.928) and the AUC of the Observer 2 shows the percentage change in CBF is good with 0.807 (95% CI = 0.669–0.944). Observer 1, a threshold of change of 10.92% in CBF got 63.6% sensitivity, 86.7% specificity, 87.5% positive predictive value, 61.9% negative predictive value, and accuracy of 72.3%. Observer 2 findings of test percentage change in CBF with a threshold of 8.07% got a sensitivity of 75%, specificity of 92.3%, a positive predictive value of 94.7%, negative predictive value of 66.6%, and accuracy improved to 81.2%. These data suggest that the percentage change in CBF due to PLR has a fair to good accuracy in predicting fluid responsiveness. The receiver operating curve of Observer 1 percentage change in CBF demonstrated 10.925 as the optimal sensitivity and specificity threshold for responsiveness. And the ROC curve of Observer 2 percentage change in CBF demonstrated 8.075 as the optimal sensitivity and specificity threshold for responsiveness. Conclusions: Showed a high correlation between the percentage change in carotid blood flow (CBF) with the percentage change in (SVI) following passive leg raise (PLR), with Pearson’s correlation coefficient of 0.645. Keeping a threshold of 8.07% accuracy of percentage change in CBF following PLR on predicting fluid responsiveness has improved to 81.2% with a positive predictive value of 94.7% and a negative predictive value of 66.6%. The Intra Class correlation coefficient between the two observers was 0.888. Hence the ability of CBF to assess the fluid responsiveness by PLR is good with high reproducibility among observers.

A Study of Correlation of Neutrophil Lymphocyte Ratio with Severity of Infection

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Background: The definitions and criteria stating the types of infection vis-à-vis SIRS, Sepsis, and Septic shock have gone a complete paradigm shift since 2016 when the third consensus guidelines were established. The understanding of biomarkers and their need in aiding a clinician’s armamentarium of resources is under the scrutiny of the world currently. A marker that aids in the grading of the severity of infection may be very useful. Its effectiveness serves us a two-part purpose of improving our diagnosis of the disease as well as improving the way severity assessment is done on the day of admission. Hence, a study in a tertiary care hospital in western India would be valuable in adding to the same evidence. Aims and Objective: To correlate the Neutrophil Lymphocyte ratio of a patient with the SOFA scoring as measured on the day of arrival at the hospital. To see whether NLR is affected by any associated comorbidities or another demographic factor. To also in Hindsight correlate the NLR with the culture reports of the patient. Materials and methods: A total of 60 patients were recruited for the study. Upon arrival, their vital parameters and their complete blood count, biochemistry parameters and culture, and procalcitonin values wherever present.
were noted down. The NLR and SOFA scores of each of them were evaluated for correlation (Spearman’s rank correlation coefficient) and whether any other factor influenced the NLR of the patient. **Results:** Out of 60 patients enrolled in the study, 37 patients were found to have SIRS, 19 were in SEPSIS and 4 were in SEPTIC SHOCK. When seen in hindsight, only 43.33% of patients overall had an abnormal temperature and 6.67% had abnormal blood pressure. Cultures could only isolate organisms in overall 38.4% of the patients, with subgroup analysis showing a positive culture in only 29.41% of sepsis cases and 25% of septic shock cases. Neutrophil Lymphocyte Ratio (NLR) for the population had a mean of 10.6 with a standard deviation of 8.64. (Range min = 1.41, Max = 46, and median of 9.15). We found that the NLR was correlated to the age of the patient with a p-value of 0.01391 among the demographic factors. The only comorbidity that had a significant correlation with NLR was hypertension with a p-value of 0.0003 (p = 0.46; r² = 0.128; p < 0.0003). The upwards trend of NLR and SOFA scores showed a p-value of 0.005 with the strongest being in the SIRS group (p = 0.01). It is worthwhile to note here that the analysis also showed that the NLR and SOFA scores very strongly correlated in the group with SIRS of 4 (p = 0.93; r² = 0.933; p = 0.008). A strong positive correlation was found between NLR and SOFA SCORE in the group with culture positive (p = 0.53; r² = 0.086; p = 0.016) vs culture negative (p = 0.36; r² = 0.151; p = 0.042) which showed a much weaker correlation. When compared, NLR and Procalcitonin showed no correlation in our study, they were not statistically significant with a p-value of 0.74437. No correlation could be found in NLR and SOFA SCORE in either procalcitonin positive (p = 0.43; r² = 0.187; p = 0.567) or (p = 0.86; r² = 0.74; p = 0.061) negative groups.

**Conclusions:** NLR can thus be used as an effective marker to denote the severity, need for antibiotic escalation, and inotropes and to guide our judgment for patients with probable infection. It can be used as a surrogate marker upon initial evaluation of the patient before the biochemistry and other parameters are available. In a country like ours with a massive population and shockingly low doctor-to-patient ratio, any marker that’s quicker than our traditional ones with evidence to back its conviction is a bonus to our clinician’s armor. Also, to note here would be that in several periphery centers finding the resources and expenses to run the other markers of severity along with their duration of them, might not be similar to our tertiary healthcare center. Further studies are needed to see the correlation between the morbidity and mortality on follow-up of patients as compared to the day one correlation of NLR and SOFA score. **Keywords:** Infection, Neutrophil, SOFA, Sepsis, Severity.

**Clinical Profile and Outcome of Mechanically Ventilated COVID-19 Patients: A Single Center Prospective Observational Study from Central India**

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**Introduction:** Acute respiratory distress syndrome leading to respiratory failure was the major cause of mortality in severely ill COVID-19 cases. We did a prospective analysis of severely ill COVID-19 patients requiring invasive mechanical ventilation admitted to our center. The objective was to evaluate the clinical profile, risk factors, and outcome in critically ill COVID-19 patients requiring invasive mechanical ventilation. **Materials and methods:** The data were collected regarding demographics, comorbidities, laboratory parameters, and treatment. Severe COVID-19 illness was defined as a respiratory rate > 30/minute, SPO₂ <90% at room air, along with symptoms like breathlessness/breadevidence of acute respiratory distress syndrome (ARDS), respiratory failure requiring assisted ventilation, multi-organ dysfunction syndrome (MODS). Logistic regression was used for the analysis of the association of risk factors to the outcome. **Results:** From 07th July 2020 to 09th August 2021, 38 (66.67%) out of 57 severe COVID-19 cases required invasive mechanical ventilation. The day-28 mortality was 71.05% in patients requiring invasive mechanical ventilation. Acute kidney injury was common (34.21%) and was associated with increased mortality (78.8%). Lactate dehydrogenase (LDH) odd ratio (OR-1.007 [95% CI = 1.00–1.01]), D-dimer (OR-1.003 [95% CI = 1.00–1.00]), High Neutrophil to Lymphocyte ratio (OR-1.276 [95% CI = 1.085–1.499]), were independently associated with increased risk of IVM. In the adjusted model, increasing age AOR [95% CI = 1.07 (1.02–1.12)], known hypertension AOR [95% CI] =3.38 (1.13–10.08), and Diabetes mellitus AOR (95%CI) = 28.5 (6.04–134.13) were found to be significant predictors of death among COVID-19 patients. **Conclusions:** Invasive mechanical ventilation requirement in patients with COVID-19 is associated with higher mortality. Inflammatory markers like LDH, D-dimer, and NLR can be used to predict the prognosis. **Keywords:** COVID-19, Acute respiratory distress syndrome, Invasive mechanical ventilation. **Discussion:** There is wide variation in the clinical severity of COVID-19 ranging from an asymptomatic state to severe disease. Around 20% of hospitalized cases develop severe disease and in-hospital case fatality due to COVID-19 has been reported as 2–3% by multiple studies. In our study, day 28 mortality was 71.05% in cases requiring invasive mechanical ventilation. Various factors have been proposed to affect disease severity in COVID-19. Pre-existing chronic illness like hypertension (57.89%) and diabetes mellitus (65.8%) was common in severe cases. The high NLR and high inflammatory markers like CRP, LDH, ferritin, and D-Dimer are associated with severe COVID-19, and similar results were seen in our study. The median duration of onset of symptoms to tracheal intubation was 10 (1–18) days coinciding with the critical pulmonary phase of COVID-19 as reported in other studies. The rate of IMV was 70%–79% in critical COVID-19 in other studies as compared to 66.67% in our study. It may be explained by the higher use of NIV and HFNO rather than early intubation at our center. HFNO can prevent the need for IMV in patients with COVID-19, had been reported in other studies. Prospective design is the major strength of our study but has weaknesses like a single center and a small sample size.

**References**


Study of Oral Hygiene in Mechanically Ventilated Patients in Mixed Medical – Surgical ICU

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Introduction: Ventilator-associated pneumonia (VAP) is defined as pneumonia that develops at least 48 hours after endotracheal intubation and initiation of mechanical ventilation. VAP is the second most nosocomial after urinary tract infection and the most common infection in mechanically ventilated ICU patients. The current practice of oral hygiene in intubated patients in ICU comprises combined chemical (0.12% chlorhexidine) and mechanical cleaning, as it has been shown to decrease the incidence of opportunistic infections such as nosocomial pneumonia. The standards for routine oral hygiene given by the center for disease control and prevention include brushing teeth, gums, and tongue at least twice a day with a soft pediatric toothbrush and moistening oral mucosa and lips every 2–4 hours. They also recommend the use of 0.12% oral chlorhexidine to rinse the oral cavity twice daily and to suction the oral cavity/pharynx. There is a known association between oral bacteria and respiratory infections. Dental plaque has the potential to be colonized by respiratory pathogens and this, together with micro-aspiration of oral bacteria, can lead to pneumonia, particularly in the critically ill. ICU patients are at higher risk as they are unconscious or sedated often when on mechanical ventilation. These patients are at high risk of ventilator-associated pneumonia due to the plaque microbial community observed in the mouth and also the pre-existing poor oral care on admission. This adds to longer ventilator days and longer ICU stays in these patients. Objective: To study the oral hygiene status in mechanically ventilated patients in ICU.

Material and methods: There are 5 healthcare workers which include 1 doctor and 4 nurses had been responsible for data collection. Data collected include APACHE score, gender, ICD code of disease, preexisting malnutrition, recent antibiotics before admission, and the number of antibiotics. One dedicated staff and one dedicated doctor have examined in every shift duty the oral hygiene of the patient with a Hihi Tex 4.5mm optical camera which has been evaluated and categorized by a single observer to avoid variability. Following the kaiser-jones brief oral health status examination (BOHSE) for categorization. From BOHSE classification we considered lymph node lips, tongue, Tissue (inside cheek, floor, and roof of the mouth), Saliva, Condition of natural teeth, Condition of artificial teeth, and Oral cleanliness. Gums between teeth and/or under artificial teeth, Pairs of teeth in chewing position (natural or artificial). Results: About 72% of patients had good oral health status (0–5 scoring), 24% of patients had moderate (sub-optimal) oral health status (6–10 scoring), and 4% of patients had bad oral health status (>10). Almost 1/4th of ventilated patients had less than optimal oral hygiene status in spite of giving oral care twice daily. Conclusions: The present protocol for oral hygiene seems to be inadequate when it comes to oral care in mechanically ventilated patients.

References


