PEDIATRIC ORAL PRESENTATION

PEDIATRIC PAPER SESSIONS: ORAL

Cardiovascular & Hemodynamics: PD1-PD2

PD1

COMPARISON OF SUPERIOR VENA CAVAL OXYGEN SATURATION AND FEMORAL BASED OXYGEN SATURATION IN CHILDREN WITH FLUID REFRACTORY SEPTIC SHOCK

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Objective: Our objective was to evaluate the agreement between Sfvo2 and Scvo2 after initial fluid resuscitation in children with fluid refractory septic shock.

Methods: We enrolled 10 children who were referred to our pediatric intensive care unit (PICU) with a femoral catheter in situ (placed in the emergency department) and had subclavian/IJV catheter inserted in the PICU immediately upon arrival. The two catheters were left in place for a period of 6 hours after which the femoral vein catheter was removed. Two sets of paired blood samples from both the catheters were drawn simultaneously at three time points i.e. after 1 and 6 hr of initiation of fluid resuscitation and were analyzed using radiometer ABL 800 co-oximeter.

Results: Although there was no significant difference between the mean Scvo2 and Sfvo2 values at the end of 1st or 6th hr of resuscitation, there was poor agreement between the two saturations at 1 hour after fluid resuscitation with a mean difference of 2.7% and limits of agreement being -25.5 to 30.9. The agreement between the two values however improved with time. Out of five children who had Scvo2 ≤ 70% at 1 hr after resuscitation, Sfvo2 correctly identified only two children (40% sensitivity) of the five children who had normal Scvo2, only four had Sfvo2 of >70% after 1 hr (80% specificity).

Conclusion: Given the poor agreement and low sensitivity of Sfvo2 at the end of first hour of fluid resuscitation, one cannot rely on Sfvo2 values as a therapeutic end point in early goal directed resuscitation of children with septic shock.

PD2

EFFECT OF PRE OPERATIVE SEPSIS ON POST OPERATIVE OUTCOME OF PAEDIATRIC CARDIAC SURGERY PATIENTS

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Objective: To investigate the effect of preoperative infection on postoperative outcome in paediatric cardiac surgery patients.

Materials and methods: A retrospective analysis was made of children who underwent congenital heart surgery in our hospital between June 2012 to December 2012 and had preoperative indicators suggesting sepsis which included clinical variables like fever, respiratory symptoms, mechanical ventilation along with positive laboratory findings of infection, which were defined as presence of leukocytosis (>12,000/mL), high C-reactive protein levels (>10 mg/L), raised PCT, positive blood and urine cultures. Study patients (group A, n = 50) identified from the preoperative data were compared to age matched control patients (group B, n = 50) who did not have any clinical or laboratory evidence suggestive of infection. Postoperative data included fever, requirement and duration of inotropic support, duration of mechanical ventilation, length of ICU and hospital stays along with laboratory parameters.

Results: 1: Study group patients had increased length of stay in ICU, duration of fever, duration of mechanical ventilation, extubation failures and requirement of inotropic support as compared to the control group. (P<0.05). 2: Laboratory parameters were significantly deranged in study group post cardiac surgery than control group: PCT (7.27 ng/ml ± 4.38) against (1.16 ng/ml ± 0.47), HSCRP (>10 mg/L) 70% as against 30% along with significant increase in patients with raised TLC and thrombocytopenia in study group (P<0.05).

Conclusion: Preoperative septicemia is associated with significant increase in morbidity in congenital heart disease patients and its optimal control prior to surgery will improve outcome post surgery.

Endocrine: PD3

PD3

A STUDY OF ABNORMAL BLOOD GLUCOSE LEVELS AND ITS CORRELATION WITH OUTCOME IN CHILDREN ADMITTED TO PEDIATRIC ICU.

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Objectives: Hypoglycemia or hyperglycemia is associated with poor outcome in critically ill adult patients. This study was done to study abnormal blood glucose levels and correlation with outcome in children admitted to PICU.

Material & Methods: 100 consecutive patients (1mo-18 yrs, >24 hrs stay) were prospectively studied. Patients were categorized normoglycemic (random blood sugar 60-150 mg/dl), hyperglycemic (> 150 mg/dl), and hypoglycemic (< 60 mg/dl). Diabetic children were excluded.

Results: Mean age of the patients was 51 months (male to female ratio of 2.3:1). At admission 12 patients had hypoglycemia, 21 had hyperglycemia. During ICU stay, 12 children had hypoglycemic records, 25 had hyperglycemia, 11 had both hypo and hyperglycemic records and rest 52 remained normoglycemic. Three patients with persistent hyperglycemia needed insulin. 28 patients required inotropes, among these abnormal glucose levels was recorded in 57% patients (p = 0.56). 47 patients needed ventilatory support, of whom 34% had hypoglycemic records; 53% hyperglycemic records (p<0.001). 25 patients had nosocomial sepsis; one-fourth had hyperglycemia (p = 0.79). PRISM score was not significantly different in normoglycemic vs abnormal glucose level patients (p = 0.1837). Mean duration of ICU stay in patients with normoglycemia was 5.3 days, compared to 12.1 days in patients with abnormal blood sugar records (p = 0.002). 15 patients were discharged against medical advice and 5 died out of whom 80% had abnormal records (p = 0.05).

Conclusions: Nearly half of patients admitted to PICU had
abnormal blood glucose levels. Patients with abnormal blood sugar records had longer duration of ICU stay and mortality.

**Nephrology: PD4**

**PD4**

**OUTCOME OF AKI ACCORDING TO PRIFLE CRITERIA IN RELATION TO PRISM 2 SCORE.**

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**Aims:** To study the clinico-etiological profile of Acute Kidney Injury (AKI) with according to pRIFLE criteria and correlate its outcome in relation to PRISM 2 score. Setting: Hospital based prospective study.

**Methods:** This study was conducted in Pediatric Intensive Care Unit of Dayanand Medical College & Hospital, Ludhiana over one year. All patients with renal dysfunction between age of 1 m - 15 yrs were included. History, physical examination and investigations of cases were entered in a set performa and managed accordingly. Renal dysfunction was graded according to pRIFLE criteria and results in relation to PRISM 2 score analyzed.

**Results:** Fifty three cases of AKI were included with M:F ratio of 1.65:1. Common causes of AKI were sepsis (42%), acute diarrheal disease (ADD) (9.4%) and hepatic encephalopathy (HE) (7.4%). Maximum cases were seen in < 1 year group (34%), in which sepsis and ADD were common causes. Patients with ADD, HE, Head injury, Diabetic Ketaacidosis were seen in Risk/ Injury group where as patients with Malaria, Pigmenturia, Tubulointerstitial nephritis, PSGN were seen in FAILURE group. Sepsis was seen in all three groups. Eighty percent of cases were treated conservatively. Patients with Sepsis and HUS required dialysis compared to other etiologies. Patients with RISK group had shorter PICU stay (4.1 days) compared to FAILURE group (5.1 days). Patients in RISK group had better survival (70%) compared to FAILURE group (47%).

**Conclusions:** pRIFLE score is an important tool to grade severity of renal dysfunction and to predict outcome in patients with AKI.

**Neurology: PD5**

**PD5**

**A COMPARATIVE STUDY OF JAMES ADAPTATION OF GLASGOW COMA SCALE AND SIMPLER BLANTYRE COMA SCALE IN NON VERBAL INFANTS IN PEDIATRIC ICU: WILL SIMPLIFICATION HELP**

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**Objective:** to evaluate the predictive power of each individual component of James adaptation of Glasgow Coma Scale (MGCS)(Range 3-15) and a simpler Blantyre coma scale (range 0-5) in relation to mortality, morbidity and functional status in infants .

**Method:** Both scales were recorded for all infants (>28 days to <1 year of age) at the time of admission and Their Functional Status Score (FSS) at the time of discharge from PICU for one year. Two scales were compared using Receiver Operating Characteristic Curve (ROC) and calculating the area under the curve (AUROC) with regards to mortality, functional outcome and morbidity.

**Results:** Total 92 infants were evaluated (male to female ratio 4.5:1). Median age at admission was 3 months. Mortality was 10.3%. Major systems involved were respiratory (36%), Central Nervous (21%), cardiovascular (12%). For MGCS, Motor response score was better than verbal and eye for predicting requirement of inotropic support (p=0.025), longer hospital stay and ventilator support (p=0.032 and 0.025 respectively). But when simplified to 3 ranked score, verbal response of BCS had significantly lower AUROC than total score (mortality, inotropic support and ventilatory support p=0.001, 0.0007 and 0.002 respectively). There was no significant difference in both scales in predicting mortality (p=0.768), use of inotropic support (p=0.400) and ventilatory support (p=0.894) when total score were compared. Both initial MGCS and BCS had significant correlation with Functional Status Score, which determines immediate outcome at discharge (p=0.0001 and p=0.001 respectively).

**Conclusion:** Motor response is the most sensitive parameter amongst all the components of GCS correlating significantly better than others for predicting morbidity. BCS is a simpler, easy to use coma scale and has good predictive power for outcome, being a simpler scale, it can replace MGCS in emergency department evaluation but the verbal component of BCS is needed to be revised.

**Nutrition: PD6**

**PD6**

**RISK FACTORS FOR DEATH IN SEVERELY MALNOURISHED UNDER-FIVE CHILDREN PRESENTING WITH SEVERE/VERY SEVERE PNEUMONIA IN AN URBAN CRITICAL CARE Ward IN A DEVELOPING COUNTRY**

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**Objective:** We evaluated the factors associated with death in under-five children who were hospitalized for the management of pneumonia and severe acute malnutrition (SAM).

**Methods:** In this unmatched case-control design, SAM children of both sexes, aged 0-59 months, admitted to the Dhaka Hospital of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) with radiological pneumonia during April 2011 to July 2012 were studied. SAM children with pneumonia who had fatal outcome constituted the cases (n=35), and randomly selected SAM children with pneumonia who survived constituted controls (n=105).

**Results:** The median age (inter-quartile range) was comparable among the cases and the controls [8.0 (4.9, 11.0) vs. 9.7 (5.0, 18.0); p=0.210]. In logistic regression analysis, after adjusting for potential confounders such as vomiting, abnormal mental status, and systolic hypotension (<70 mm of Hg) even after correction of dehydration or in absence of dehydration, severely malnourished under-five children with pneumonia more often had hypoxemia (OR=23.15, 95% CI=4.38-122.42, p<0.001), clinical dehydration (some/severe) (OR=4.98, 95% CI=2.42-37.19, p=0.001), abdominal
distension (OR=4.41, 95% CI=1.12-16.52, p=0.028) at admission and received blood transfusion (OR=5.50, 95% CI=1.21-24.99, p=0.027) for the management of crystalloid resistant systolic hypotension (<70 mm Hg).

**Conclusion:** Hypoxemia, clinical dehydration, and abdominal distension are the independent predictors of death in SAM children with pneumonia. SAM children with pneumonia who requires blood transfusion for the management of crystalloid resistant systolic hypotension are at risk of death. There thus, early identification and prompt management of these simple clinical predictors of death and simultaneously discourage the use of blood transfusion for the management of crystalloid resistant systolic hypotension may help to reduce morbidity and deaths in such population.

**Others: PD7-PD8**

**PD7**

**KNOWLEDGE OF PULSE OXIMETRY AMONG HEALTH CARE PROVIDERS’ WORKING IN PEDIATRIC SETUP**

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**Objective:** Measure knowledge of pediatric nurses about pulse oximetry technology, Measure knowledge of pediatric nurses regarding pulse oximetry and the ability to apply it in a given clinical scenario.

**Materials and Methods:** A descriptive study was carried out on 60 nurses working in Pediatric units of B. P. Koirala Institute of Health Sciences, Dharan, Nepal. The subjects were recruited through census sampling from selected wards. Data were collected using semi-structured questionnaires. Descriptive statistics and chi square techniques were employed for analyzing data.

**Results:** It was found that 84% of the nurses felt they require adequate training; 84% correctly identified what a pulse oximeter measured; 40% correctly identified how a pulse oximeter worked, but only 5% had a correct understanding of the oxyhemoglobin dissociation curve. Nurses identified a wide range of normal arterial oxygen saturation values and made numerous errors in evaluating saturation readings in hypothetical clinical situations.

**Conclusions:** Although the majority of pediatric staff felt need of training and knowledgeable about pulse oximetry, there was a lack of knowledge of basic principles. The results of this study have implications for basic professional education programs and the orientation and ongoing education of pediatric health care providers.

**PD8**

**INCIDENCE OF CENTRAL VENOUS CATHETER RELATED INFECTIONS IN PEDIATRIC INTENSIVE CARE UNIT**

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**Objectives:** To study the incidence of central venous catheter (CVC) related infections in PICU, associated risk factors and final outcome.

**Material and Methods:** This prospective study was done in a 10 bedded PICU of a tertiary care hospital over 1 year. Subjects included were between the age of 1 month to 15 years who had CVC inserted for more than 24 hours. Catheter tips were sent for culture in all patients and blood culture was sent in all suspected CRBSI cases.

**Results:** 70 patients were enrolled in the study. The mean age of patients was 2.79 years with male-female ratio of 2.8:1. Rate of Catheter related blood stream infection (CRBSI) was found to be 2.9% (93/1000 central line days). Rate of CVC colonization was 15.7% (217/1000 central line days). S Organisms isolated from CRBSI cases were Pseudomonas aeruginosa and Candida tropicalis whereas Staph aureus and candida were common organisms from catheter tip. Femoral CVCs were inserted in more patients (91.4%) than IJV catheters (8.6%). No significant difference was found in CRBSI and CVC colonization with regard to type/site of CVC, number of lumens and initial PRISM score. Malnutrition and CVC duration (>10 days) were significant risk factors for CRBSI. Mean duration of stay in CRBSI cases was 23 days compared to 15 days in non-CRBSI. Mortality was 50% in CRBSI cases and 10.3% in non-CRBSI cases.

**Conclusion:** The study shows a low incidence of CRBSI rate in our PICU irrespective of the site of insertion. It also highlights underlying malnutrition and duration of catheterization as two major risk factors for CRBSI.

**Sepsis: PD9-PD13**

**PD9**

**MICROALBUMINURIA - A NOVEL MARKER FOR DETERMINING OUTCOME IN CRITICALLY ILL PEDIATRIC PATIENTS**

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**Objective:** To study the prevalence and predictive value of microalbuminuria in critically ill children study site-12 bedded picu of tertiary care hospital study design-prospective non-interventional study

**Subjects and methods:** Of 1052 consecutive pediatric patients admitted in picu 455 were included for the study. Exclusion criteria for study- age <28 days or >16 years , picu stay <24 hours, menstruating female child, patients with kidney disease, hypertension, diabetes, children on immunomodulator, chemotherapy drugs. Spot urine samples were collected on admission,12 hours and 24 hours. urine albumincreatinine ratio(acr) was measured on picu admission (acr1), 12 hours(acr2) and after 24 hours(acr3). On admission patient demographics were noted along with disease severity scoring prism, pelod scores were calculated. Each patient was followed up throughout their hospital stay and outcome data picu stay and survival was obtained.

**Results:** Of the 455 patients,396 survived while 59 patients died in picu,non-survivors had significant higher median acr3 (134.98[iqr 58.8-480.53]) in comparison to the survivor who had median acr 71.02 (iqr 24.7 - 168.1) (p< 0.0001).in a receiver operating
characteristic curve (roc) analysis, acr3 emerged as the best indicator of mortality [area under curve (auc) of acr3 = 0.68 > auc (acr2) = 0.59 > auc (acr1) = 0.57]. At a cutoff of 195, acr3 had a sensitivity of 47.5%, specificity of 79.5%, positive predictive value of 25.3% and a negative predictive value of 91% for predicting mortality in critically ill pediatric patients.

Conclusion: Absence of significant microalbuminuria at 24 hours of picu admission may help to predict survival in the picu. Key words: Microalbuminuria, Mortality, Critically ill pediatric patients, Severity of illness, Pediatric intensive care unit, Outcome.

PD10
TO STUDY PROCALCITONIN KINETICS IN PEDIATRIC PATIENTS WITH OPEN HEART SURGERY AND ITS SIGNIFICANCE TO DISCRIMINATE BETWEEN SEPSIS AND SYSTEMIC INFLAMMATORY SYNDROME

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Objective: To evaluate procalcitonin kinetics as marker of inflammation severity and its specificity in discriminating between sepsis and systemic inflammatory response syndrome after pediatric open heart surgery. Design: Prospective, observational, clinical study in 17 bedded tertiary pediatric intensive care unit.

Materials and methods: PCT kinetics was evaluated at 1, 3 and 7th day in thirty pediatric patients undergoing open heart surgery with cardiopulmonary bypass (CPB) (SIRS model: Group 1, n = 15) and patients with clinical sepsis (SIRS + Sepsis, Group 2, n=15). Postoperative data included fever, requirement and duration of inotropic support, duration of mechanical ventilation, length of ICU and hospital stays along with laboratory parameters.

Results: In Group 1, PCT median concentration was 0.24 ng/ml (reference value <2.0 ng/ml). Average PCT concentration was 0.47 ng/ml at 24 hours; 0.33 ng/ml at 72 hours and then decreased to 0.12 ng/ml at 7th postoperative day. All patients had favourable outcome. In Group 2, average PCT was 1.02 ng/ml at 24 hours which increased to 4.15 ng/ml at 72 hours. It decreased in 12/15 patients who progressed favourably (average 0.61 ng/ml). 6/15 patients had culture positive septicaemia. 2/3 patients with persistent elevated PCT at 7th postoperative day expired.

Conclusion: PCT kinetics is able to differentiate between SIRS and postoperative infection(sepsis) during postoperative follow-up period. PCT concentration varied with the evolution of sepsis.

PD11
PREDICTORS OF DEATH IN UNDER-FIVE CHILDREN WITH SEPSIS ATTENDING AN URBAN DIARRHEAL TREATMENT CENTRE IN BANGLADESH

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Objective: To evaluate the clinical and laboratory predictors of death in under-five children with clinically defined sepsis presenting with diarrhea.

Materials and methods: We prospectively enrolled all the diarrheal children (n=151) aged 0 to 59 months with clinical sepsis admitted in the SCW during September 2007 through December 2007. Comparison was made between deaths (n=23) and survivors (n=128). Sepsis is defined as presence of inflammation [abnormal WBC count (>12x109/l or, <4x109/l or, band and neutrophil ratio ≤ 0.10] plus presence or presumed presence of infection with thermo-instability [hypothermia (≤ 35.0o C) or hyperthermia (≥ 38.5o C)], tachycardia and/or the indications of altered organ function (altered mental status and bounding pulse) in the absence of clinical dehydration or after correction of dehydration.

Results: The median age (inter-quartile range) of the children who survived and died were 4.0 (2.0, 12.0) and 1.5 (0.8, 10.0) respectively. In the logistic regression analysis, after adjusting for potential confounders, such as abnormal WBC count, use of intravenous fluid, patient with fatal outcome more often presented with hypotension (odds ratio = 16.48, 95% confidence interval = 2.21-123.12; p = 0.006), lobar consolidation (odds ratio = 19.9, 95% confidence interval = 2.99 – 132.80; p = 0.002), hypoxaemia (odds ratio = 14.78, 95% confidence interval = 1.38-157.90; p = 0.026) and severe acute malnutrition (odds ratio = 7.57, 95% confidence interval = 1.24 – 46.11; p = 0.028).

Conclusion: Our data suggest that children under-five with clinical sepsis who present with lobar pneumonia, hypoxaemia, severe acute malnutrition and hypernatema are at higher risk of death and identification of these factors may help clinicians to take prompt initiative for the aggressive management of such children especially in a resource-limited setting like Bangladesh.

PD12
INCIDENCE OF BLOOD STREAM INFECTION AND ANTIBIOTIC SUSCEPTIBILITY PATTERN IN ADULT VS PEDIATRIC ICU

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Objective: Patient characteristics in adult vs pediatric ICU suggest the pattern of blood stream infections experienced may differ in these groups.

Methods: Data was collected from pediatric and adult ICU (Jan-Jun 2012) using standard surveillance protocol.

Results: Total 1513 blood cultures were sent, 168 from children and 1345 from adult patients. Blood stream infections were more in adults (18.7%) compared to pediatrics (15.47%). Klebsiella (19.04%) and Acinetobacter (19.04%) were the most common isolates in adult and Klebsiella (26.92%) was commonest isolate in children. Other common isolates in children were Acinetobacter (11.53%), candida (11.53%), E.coli (11.53%), pseudomonas (11.53%) and in adults were Staphylococci aureus (16.66%) and candida (13.5%). Fungal infections were more common in adults (13.5%) than in children (11.5%). Nearly 90.4% Staph aureus was Methicillin resistant in adults compared to 50% in children. Enterococcus faecium was Vancomycin resistant in 12.5% adults, but no VRE was seen in children. E.Coli isolates were more sensitive to carbapenems in pediatric (100%) versus adults (43%).
Acinetobacter had maximum sensitivity to tigecycline and colistin in both adults and children. For Klebsiella isolates 100% sensitivity was seen to tigecycline in both groups and carbapenems sensitivity was more in adults (45.5%) compared to children (14%). Fungal organisms in both groups were all sensitive to fluconazole.

**Conclusion:** Blood stream infections in ICU are more common in adults compared to children. Antibiotics resistant organisms are increasing in ICU but more in adults compared to children. Klebsiella and Acinetobacter isolates are more resistant to carbapenems in children compared to adults.

**PD13**

**EXPERIENCE WITH PENTAGLOBIN (IgM enriched IMMUNOGLOBULIN) IN A GROUP OF INFANTS WITH SEPSIS POST CARDIAC SURGERY**

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**Background:** Sepsis is a major cause of end organ dysfunction and mortality after complex cardiac surgery in neonates and infants despite appropriate antibiotic regimens. IVIG are frequently used as an adjunctive therapy in critically ill infants as they have deficient immunoglobulin levels, compounded by cardio pulmonary bypass (CPB) induced immuno suppression.

**Objective:** The study intends to evaluate the efficiency of Pentaglobin (IgM enriched Immunoglobulin) (PG), as adjunctive therapy for severe sepsis in infants post cardiac surgery. The objective was to assess reduction in the sepsis induced mortality and to identify the improvement of clinical and laboratory parameters such as the total leucocyte count (TLC), platelet count, biomarkers, haemodynamics, respiratory parameters, metabolic acidosis, urine output, coagulation profile, feed tolerance and neurologic status. Design & Setting Retrospective study in a 17 bedded PICU in a tertiary referral centre.

**Methods and Results:** Fourteen infants with sepsis in the postoperative period after cardiac surgery between January and November 2012 were included in the study. Except one, the rest 13 underwent complex surgery with prolonged CPB. PG was started in children with clinical/laboratory confirmed sepsis with persistent low TLC and thrombocytopenia, haemodynamic instability, despite receiving empirical broad spectrum or sensitive antimicrobials for 72 hours. Seven patients showed improvement in clinical parameters; decline in biomarkers and overall clinical status. Seven patients died of which two were acute deaths due to multidrug resistant (MDR) sepsis and 3 had residual cardiac or respiratory illness. Two sudden deaths were reported after discharge from the ICU.

**Conclusion:** While the intravenous PG did not significantly reduce the mortality rate in study population, it did improve survival rate of those with severe sepsis. Further studies are necessary to identify the group of patients who might benefit maximum from immunoglobulin therapy and ascertain on timing of initiation of the therapy.