EDITORIAL

Prone for COVID: Are You Awake?

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The management of respiratory failure of patients with coronavirus disease-19 (COVID-19) revolves around the ventilator strategies used for ventilating patients with acute respiratory disease syndrome (ARDS).[1] The basic pathophysiology involved in the worsening of respiratory system is interstitial edema due to inflammatory mediators leading to atelectasis. This leads to ventilation perfusion (V/Q) mismatch and a significant shunt fraction.[2] Another interesting finding in COVID-19-confirmed patients is the presence of microthrombi which cause varying degrees of inefficient ventilation due to dead space ventilation.[3] In ventilated, sedated patients with ARDS, the strategy of prone position ventilation has been shown to reduce mortality and has become a part of the treatment regimen.

Prone position has shown to have some basic physiological advantages.[4] By proning, the dependent areas of the lung become nondependent and this helps in reducing the V/Q mismatch as more perfused part of the lung gets more ventilation. Secondly, the weight of the thoracic structures also reduces on the already inflamed lung. Thirdly, prone position has been associated to better secretion clearance. But all these advantages have been documented in patients who are mechanically ventilated for ARDS. The pandemic of COVID-19 pushed the clinicians against the wall as a reasonable proportion of patients required invasive ventilation, hence putting high burden on the ICU workload and forcing them to devise alternative strategies to avoid intubation in such patients.

Necessity is the mother of invention! And hence came the concept of "awake proning." The concept was an extrapolation of the physiology that showed improvement in ventilated patients. Here the nonintubated patient was made to lie in the prone position as long as the patient could tolerate and then used to keep changing his/her position so that they do not lie in the supine position for longer periods. The other probable advantage that was considered with awake proning was prevention of patient self-inflicted lung injury (P-SILI) that happened due to large respiratory excursions that occurred due to spontaneous breaths by a patient in ARDS in supine position.[5]

Very limited literature is available on awake proning in nonintubated patients. Caputo et al.[6] could demonstrate a significant increase in SpO_2 within 5 minutes of proning (preproning: 84%, postproning: 94%, $p = 0.001$). Elharrar et al.[7] did an observational pilot study on prone positioning in COVID patients and concluded that 63% patients tolerated a 3-hour session but only 25% patients showed improvement in oxygenation. Sartini et al.[8] managed to demonstrate an increase in SpO_2 in all 15 patients who were on continuous positive airway pressure with FiO_2 0.6.

This month, in our journal, a small retrospective case series on prone position for acute hypoxemic respiratory failure in nonintubated patients has been published by Rao et al.[9] The authors looked at the data over the past 5 years and captured data of 13 patients. They categorized the patients as having mild, moderate, or severe hypoxemia based on P/F ratio with severe category having a P/F ratio <100. The patients were given support with noninvasive ventilation or high-flow nasal cannula oxygen. They concluded that the P/F ratio improved from 154.3 ± 52.3 to 327.8 ± 65.4 ($p < 0.0001$) over an average of 65.4 hours. They also found an improvement in alveolar-arterial gradient. First of all, it is a very small study and among 13 patients, 2 patients did not have radiological features of ARDS, so actually speaking, they could have been breathless due to any reason. Secondly, they continued to nurse the patients in the prone position even if the P/F ratio was <150, which was present in six of their patients. As per the Florali[10] and Lungsafe[11] study, P/F ratio <200 is an indication for intubation, and prolonging such patients on noninvasive ventilation techniques is associated with poor outcome. The authors conclude that awake proning can be done safely in patients with various etiologies of respiratory failure, which, in my opinion, requires a lot of validation and should be followed very cautiously.

Does improvement in hypoxemia prevent intubation? This is the question which needs to be answered precisely as intubation is a clinical decision and one cannot avoid it purely based on hypoxemia. The improvement in oxygenation status may prevent the clinicians from intubating their patients and may lead to delayed intubation culminating in poor outcome. The other question that one needs to answer is the efficacy of the reduced duration of proning as in awake patients. In the PROSEVA trial,[12] patients showed clinical benefit when the duration of proning was at least 16 hours. As awake proning is a discomforting posture for a tachypneic hypoxemic patient, the maximum tolerated duration has been found to be around 3 hours only. Unless we have large trials showing the subset of patients who will benefit from awake proning, till that time, the clinicians should closely monitor their patients who are on awake proning and not delay the need of intubation and mechanical ventilation based on improvement in P/F ratio alone.

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