



Letter to the Editor

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Noninvasive versus invasive ventilation: one modality cannot fit all during COVID-19 outbreak

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Noninvasive ventilation (NIV) is considered as the first-line treatment for conditions, namely, acute exacerbations of chronic obstructive pulmonary disease (COPD), acute cardiogenic pulmonary edema, acute respiratory failure in the immunocompromised and in weaning COPD patients off-invasive ventilation; however, its role as respiratory support in patients with acute lung injury and acute respiratory distress syndrome (ARDS) remains highly controversial. Though various studies have reported favorable usage of NIV in such clinical conditions, the demographics of patients actually benefiting from its use are still indefinable. The current approach of maintaining a low threshold for endotracheal intubation in patients suffering from COVID-19 related ARDS is followed by most clinicians globally that have resulted in an undermined role of NIV for management of ARDS associated with COVID-19. Herein, we would like to briefly review this approach while dealing with patients during the COVID-19 pandemic.

Clinical benefit of NIV in COVID-19: Several studies have reported the use of NIV in severe acute respiratory illness and have demonstrated that it can avoid intubation in up to 70% of patients with mild hypoxic respiratory failure. In a retrospective study on COVID-19 patients, Zhou et al. [1] reported that the mortality was higher in the intubated group (96%) than in the NIV group (92%). A similar study on COVID-19 patients by Yang et al. [2] revealed a mortality rate of 86% and 57% in the intubated group and the NIV group, respectively. Cascella et al. [3] showed a favorable outcome of NIV in COVID-19 patients suffering from a non-severe form of respiratory failure along with a low risk of airborne transmission to healthcare providers (HCPs) with the proper fitting interface.

Exaggerating disadvantages of NIV in COVID-19: The most important concern raised by clinicians with regards to the NIV approach during the COVID-19 pandemic is its potential for aerosol generation and transmission of infection to HCP. Cheung et al. [4] studied the effectiveness of NIV in 20 patients with SARS coronavirus (SARS-CoV) infection and its risk of transmission among the HCPs and reported that NIV was effective in the treatment of acute respiratory failure associated with SARS-CoV and none of the HCPs tested positive for SARS-CoV at end of the study.

ARDS in COVID-19: COVID-19 results in the massive alveolar damage because of the release of inflammatory exudates in the alveoli and infiltrates in the interstitium, thus, leading to the development of ARDS. Evidences have shown that COVID-19-associated severe ARDS displayed atypically high compliance and shunt fraction that were markedly different from severe ARDS resulting from other causes. Pan et al. [5] used the recruitment-to-inflation ratio (R/I ratio) to assess the potential for lung recruitment in COVID-19 patients and found a poor R/I ratio in more than 80% of patients with severe SARS-CoV-2 associated ARDS, suggesting a poor lung recruitability. Since disturbed pul-

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monary vascular autoregulation has been implicated for hypoxemia and poor oxygenation during the early stages of ARDS, using the common protocol of applying high positive end-expiratory pressure to all the patients might aggravate the lung injury resulting in a poor outcome.

Disadvantages of invasive ventilation: The procedures associated with invasive ventilation such as preoxygenation, bag-mask ventilation, intubation or extubation, and suctioning of the airway are aerosol-generating and pose a serious risk of infection for HCPs. Ventilator-associated complications such as lung injury, pneumonia, and prolonged intubation should also be considered before making the choice for the invasive or non-invasive ventilation approach for COVID-19 associated ARDS.

We hereby conclude that there is a certain population of COVID-19 patients with ARDS having a particular demographic profile (younger age and lesser comorbidities) who may benefit from an early and meticulously supervised NIV procedure instead of blindly intubating all patients with hypoxemia and ARDS.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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