LETTER TO THE EDITOR

Analgo-sedation in Patients on Non-invasive Mechanical Ventilation: Need for Guideline Recommendation

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Dear Editor,

We are writing this to bring attention to a grey area of critical care that warrants consideration and discussion—the unmet need for guideline recommendations regarding analgosedation in patients on noninvasive mechanical ventilation (NIV). The use of NIV has expanded significantly with increased evidence of its efficacy in acute respiratory failure. Noninvasive mechanical ventilation is now being used in intensive care and high-dependency units to manage patients with hypercapnic and hypoxemic respiratory failure. The success of NIV depends on proper patient selection and interface tolerance by the patient. The ideal patients who will benefit from NIV therapy are those with respiratory failure who have an intact sensorium without any severe facial deformity, facial burns, or fixed upper airway obstruction. Noninvasive mechanical ventilation interface intolerance on the other hand is multifactorial and is the leading cause of NIV failure. Noninvasive mechanical ventilation intolerance can be due to improper interface, ventilator setting, lack of humidification, excessive air leaks, delirium, anxiety, pain, pressure sores, and claustrophobia. Proper interface is the most important factor in NIV tolerance. A properly fitting interface reduces air leaks, and improves ventilator triggering, and patient ventilation.

A systematic approach must be taken to manage patients with NIV intolerance. Interface, humidification, and air leaks must be assessed and corrected first. Ventilator settings must be reviewed so that inspiratory sensitivity, cycling and rise time suit the underlying pathology and patient. The role of pharmacological therapy in the form of analgosedation arises when these non-pharmacological methods are exhausted and the patient's NIV intolerance is attributed to delirium or anxiety. Even with ever-increasing evidence on the use of NIV, the risk-benefit ratio of sedatives and analgesics for these patients is poorly studied and the choice of drugs remains controversial with absent guidelines. The ERS/ATS guidelines and ISCCM guidelines have not offered any recommendation on analgosedation for NIV.[1,2] The BTS guidelines have recommended the use of sedative drugs in NIV with close monitoring in the ICU setting but have not offered any clarification on patient selection, drug selection, or drug dose.[3]

The use of analgosedation in NIV can have important patient benefits. It can reduce pain and anxiety whereby calming down the patient and improving ventilation. By reducing tachypnea and respiratory distress it can reduce ventilator-induced lung injury. Analgo-sedatives can modulate autonomic system response to stress and can improve sleep in patients on NIV therapy. There is good quality evidence that the use of analgosedation is associated with improved NIV tolerance and reduced risk of invasive mechanical ventilation.[4,5] While the use of sedation or analgesia alone is beneficial, their combined use is associated with increased NIV failure.[6] An ideal analgo-sedative drug should have a rapid onset and offset of action, minimal respiratory depression, wide therapeutic window, good reversibility, minimal impact on cognitive function, and should have predictive pharmacokinetics. Even though there are no ideal analgo-sedative drugs, the drugs which have been mostly studied in NIV patients include dexmedetomidine, remifentanil, midazolam, and propofol. The administration of these drugs should be closely monitored to attain a target sedation score like Ramsay score of 2–3, Richmond agitation and sedation scale (RASS) of -1–1, or sedation agitation scale (SAS) of 3–4.

Dexmedetomidine is the most studied drug for NIV sedation. Compared to other sedatives dexmedetomidine is associated with a reduced risk of intubation, shorter duration of NIV therapy, and reduced risk of delirium.[7] Most studies with dexmedetomidine have used a continuous intravenous infusion rate of 0.2–0.7 µg/kg/hr with or without a loading dose of 1.0 µg/kg over 10 minutes. It has the advantage of providing good analgesia and sedation without respiratory depression. The most common adverse effects encountered are bradycardia and hypotension.

Though the amount of evidence is small, remifentanil is another drug that is as effective as dexmedetomidine in patients with NIV intolerance. There are no significant differences between the two drugs in terms of tracheostomy, in-hospital mortality, or ICU length of stay.[8] It is given as an intravenous infusion of 0.05–0.12 µg/kg/hr. The advantage of the drug is that it is not affected by hepatic or renal dysfunction and is easy to titrate.

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Though midazolam, propofol, morphine, and haloperidol have been tried as analgo-sedatives in NIV patients dexmedetomidine and remifentanil are far superior.

In conclusion, it is high time that proper guidelines are laid out to identify patients on NIV therapy who will benefit from analgo-sedatives. The guidelines should cover the prerequisites before initiating therapy, the drug of choice, preferred dosing, and sedation goals that must be targeted.

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