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Comments on "Comparison of immediate withdrawal and stepwise reduction in duration of non-invasive ventilation in chronic obstructive pulmonary disease patients presenting with acute hypercapnic respiratory failure"

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Dear Editor

The recent study published by Purohit et al. provides new evidence on the safety of immediate withdrawal of non-invasive ventilation (NIV) in chronic obstructive pulmonary disease (COPD) patients admitted with acute hypercapnic respiratory failure (AHRF) after recovery [1]. The article suggests that stepwise reduction of NIV may prolong hospital stay and increase the risk of hospital-acquired infections along with the cost. This is a clinically important study with multiple practical implications.

The American thoracic society/European respiratory society (ATS/ERS) 2017 guidelines strongly recommend NIV for AHRF in COPD exacerbation but do not provide for the duration [2]. The Indian society of critical care medicine (ISCCM) 2020 guidelines recommend a protocolised rather than physician-directed withdrawal of NIV even though it suggests using either of the three strategies of reduction in pressures of NIV, duration of NIV or immediate cessation [3]. Even though it may not seem immaterial which of the 3 options is chosen, it has great implications on the duration of intensive care and the cost of therapy. Though, it can be easily predicted that immediate withdrawal will have minimum intensive care unit (ICU) duration, the cost analysis is lacking. Even Purohit et al. [1] found a reduced hospital and ICU stay in immediate withdrawal group without any adverse outcome in the patients. The authors could have also done a cost-benefit analysis of the immediate against stepwise NIV withdrawal in acute COPD.

Another important aspect is the predictors to successful NIV cessation which the authors have evaluated. The pCO₂ is an important criterion for home NIV in COPD [4]. In the study by Purohit et al. [1], the pCO₂ is a predictor of successful weaning. This can be explained by the underlying pathophysiology of COPD exacerbation wherein the main mechanism of hypercapnia is hypoventilation which can be easily corrected by NIV. The expiratory positive airway pressure (EPAP) requirement is low (unless there is obstructive sleep apnea concomitantly) and the inspiratory positive airway pressure (IPAP) is generally kept high to provide an adequate pressure support. Once the hypoventilation is reversed, the bronchodilators, steroids and antibiotics can easily help in recovery [5]. Thus, similar to phenotyping COPD based on etiology and severity, a phenotypic approach to COPD exacerbation based on underlying disease, superimposed infection, hypercapnia and the correction of the same can help these patients get the appropriate and timely therapy.

However, one factor which also remains ignored in all such evidence providing studies is the detailed evaluation of the indication for which NIV was acutely used in COPD. The Global initiative against lung diseases (GOLD) guidelines recommend using NIV in acute exacerbation for hypercapnia, refractory hypoxia and even in signs of muscle fatigue. Most patients in ICU with COPD exacerbation often have hypoxia or hypercapnia or both. However, those patients who have a near normal blood gas analysis and require NIV for muscle fatigue or high work of breathing are weaned off from NIV based on clinical symptoms and vitals like respiratory rate only which are often a subjective decision of the treating physician. It is imperative to have institutional guidelines for such patients also as to when NIV can be weaned. Stepwise reduction in NIV seems physiologically better in such patients so that respiratory muscles get time to recover. However, there is no evidence for the same due to studies majorly taking acute hypercapnic COPD patients in NIV trials.

Thus, the major conclusions at present which can be drawn are that NIV can be weaning immediately or in a stepwise manner in COPD exacerbation. However, pCO₂ monitoring and cost analysis must be considered while determining the choice. Larger studies focussing on indication of NIV in COPD exacerbation comparison with the weaning strategy can help formulate guidelines

References

1. Purohit S, Madan M, Kumar R, et al. Comparison of immediate withdrawal and stepwise reduction in duration of non-invasive ventilation in chronic obstructive pulmonary disease patients presenting with acute hypercapnic respiratory failure. *Monaldi Arch Chest Dis* 2023;2755. Online ahead of print.
2. Rochwerg B, Brochard L, Elliott MW, et al. Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure. *Eur Respir J* 2017;50:1602426.
3. Chawla R, Dixit SB, Zirpe KG, et al. ISCCM Guidelines for the use of non-invasive ventilation in acute respiratory failure in adult ICUs. *Indian J Crit Care Med* 2020;24:S61-S81.
4. Macrea M, Oczkowski S, Rochwerg B, et al. Long-term noninvasive ventilation in chronic stable hypercapnic chronic obstructive pulmonary disease. An official American Thoracic Society clinical practice guideline. *Am J Respir Crit Care Med* 2020;202:e74-e87.
5. Suri TM, Suri JC. A review of therapies for the overlap syndrome of obstructive sleep apnea and chronic obstructive pulmonary disease. *FASEB Bioadv* 2021;3:683-93.
6. Global Initiative Chronic Lung Obstructive Disease (GOLD). Global Strategy For Prevention, Diagnosis and Management of COPD: 2023 Report. Accessed: 20 October 2023. Available from: <https://goldcopd.org/2023-gold-report-2/>