

Letter

Intelligent Volume-Assured Pressure Support vs. Spontaneous/Timed Mode as a Weaning Strategy in COPD—Evaluation of a New Ventilation Strategy

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We thank Salama S et al. for their evaluation of noninvasive positive-pressure ventilation (NPPV) strategies in patients with chronic obstructive pulmonary disease (COPD) and who are suffering an acute exacerbation thereof [1]. We would like to query some choices for and aspects of the methodology of the study.

Firstly, higher HACOR (a composite of heart rate, acidosis, consciousness, oxygenation, and respiratory rate) scores, as well as the trend in the scores, better predicts NPPV failure when assessed within 24 h [2,3]. We wondered whether the authors had considered this for predicting NPPV failure?

Secondly, they evaluated patient comfort and quality of mask-fitting using a visual analogue scale to determine overall acceptance, as well as tolerance to NPPV, using the iVAPS mode. iVAPS is a novel dual-hybrid mode of NPPV which offers continuous automatic breath-to-breath adjustment of the level of pressure support to achieve a desired target alveolar ventilation [4]. Hence, it may be better than the S/T mode of NPPV during sleep in COPD patients due to the changing respiratory mechanics and variable ventilatory demands [5,6]. Ekkernkamp E et al. found a favourable sleep score with the use of the iVAPS mode compared to the high-intensity assist-control NPPV mode in COPD patients [5]. iVAPS was also found to improve the apnoea-hypopnoea and arousal indices in patients with chronic respiratory failure [7]. The use of iVAPS is known to improve health-related quality of life after recovery from acute illness [5,8]. It is not clear whether Salama S et al. observed any improvement in sleep quality with the use of iVAPS in their patients.

Thirdly, only the height of patients was used to predict physiological dead space which was used to calculate target alveolar ventilation in the iVAPS group. Ideally, body weight and height, and hence, body mass index, might have been used. They are known to affect functional residual capacity and respiratory mechanics [9].

Fourthly, although the groups were comparable regarding the duration of NPPV use and intensive care unit (ICU) stay, it is not clear what criteria the authors used to guide the discontinuation of NPPV or discharge from the ICU. This warrants clarification.

Finally, the authors used the ratio of partial pressure of arterial oxygen tension and the fraction of inspired oxygen concentration ($\text{PaO}_2/\text{FiO}_2$) as criteria for detecting NPPV failure and the subsequent need for re-intubation, as well as the initiation of invasive mechanical ventilation (IMV). The respiratory rate oxygenation (ROX) index, on the other hand, can evaluate the combined impact of oxygenation ($\text{PaO}_2/\text{FiO}_2$) as well as respiration [10]. ROX



Citation: Bhakta, P.; Mandal, M.; Mukherjee, P.; O'Brien, B.; Esquinas, A.M. Intelligent Volume-Assured Pressure Support vs. Spontaneous/Timed Mode as a Weaning Strategy in COPD—Evaluation of a New Ventilation Strategy. *Adv. Respir. Med.* **2022**, *90*, 279–280. <https://doi.org/10.3390/arm90040037>

Received: 4 July 2022

Accepted: 13 July 2022

Published: 28 July 2022

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monitoring could have been used during weaning from the NPPV when they used RSBI for detecting the NPPV weaning failure.

In the study in question, the authors did not find any differences in the outcomes or satisfaction scores between the iVAPS and S/T modes of NPPV in acute exacerbations of COPD during weaning from IMV. We think clarity on the above-mentioned points might aid the overall evaluation of the outcome of this study. Further well-designed, higher-powered studies are perhaps warranted to identify the subset of patients who might benefit most from the use of this innovative NPPV mode.

Funding: No external funding supported the preparation of this manuscript. The authors have no financial and/or personal relationships with other people or organizations that might inappropriately influence our work.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Salama, S.; Mohamed-Hussein, A.A.-R.; Magdy, D.M.; Hashem, S.M. Intelligent volume assured pressure support (iVAPS) vs. spontaneous/timed mode as a weaning strategy for intubated COPD patients with acute exacerbation. *Adv. Respir. Med.* 2022, *ahead of print*. [[CrossRef](#)] [[PubMed](#)]
2. Duan, J.; Wang, S.; Liu, P.; Han, X.; Tian, Y.; Gao, F.; Zhou, J.; Mou, J.; Qin, Q.; Yu, J.; et al. Early prediction of noninvasive ventilation failure in COPD patients: Derivation, internal validation, and external validation of a simple risk score. *Ann. Intensiv. Care* 2019, 9, 108. [[CrossRef](#)] [[PubMed](#)]
3. Ding, M.; Han, X.; Bai, L.; Huang, S.; Duan, J. Impact of HACOR Score on Noninvasive Ventilation Failure in Non-COPD Patients with Acute-on-Chronic Respiratory Failure. *Can. Respir. J.* 2021, 2021, 9960667. [[CrossRef](#)] [[PubMed](#)]
4. Pluym, M.; Kabir, A.W.; Gohar, A. The use of volume-assured pressure support noninvasive ventilation in acute and chronic respiratory failure: A practical guide and literature review. *Hosp. Pract.* 2015, 43, 299–307. [[CrossRef](#)]
5. Ekkernkamp, E.; Storre, J.H.; Windisch, W.; Dreher, M. Impact of Intelligent Volume-Assured Pressure Support on Sleep Quality in Stable Hypercapnic Chronic Obstructive Pulmonary Disease Patients: A Randomized, Crossover Study. *Respiration* 2014, 88, 270–276. [[CrossRef](#)] [[PubMed](#)]
6. Esquinas, A.M. Noninvasive Mechanical Ventilation in Stable Hypercapnic Chronic Obstructive Pulmonary Disease: Is Restful Sleep a Suitable Distinctive Parameter? *Respiration* 2015, 90, 175. [[CrossRef](#)] [[PubMed](#)]
7. Khayat, A.; Medin, D.; Syed, F.; Moraes, T.J.; Bin-Hasan, S.; Narang, I.; Al-Saleh, S.; Amin, R. Intelligent volume-assured pressured support (iVAPS) for the treatment of congenital central hypoventilation syndrome. *Sleep Breath.* 2017, 21, 513–519. [[CrossRef](#)] [[PubMed](#)]
8. Magdy, D.M.; Metwally, A. Effect of average volume-assured pressure support treatment on health-related quality of life in COPD patients with chronic hypercapnic respiratory failure: A randomized trial. *Respir. Res.* 2020, 21, 64. [[CrossRef](#)] [[PubMed](#)]
9. Dixon, A.E.; Peters, U. The effect of obesity on lung function. *Expert Rev. Respir. Med.* 2018, 12, 755–767. [[CrossRef](#)]
10. Colaianni-Alfonso, N.; Montiel, G.; Castro-Sayat, M.; Siroti, C.; Vega, M.L.; Toledo, A.; Haedo, S.; Previgliano, I.; Mazzinari, G.; Alonso-Íñigo, J.M. Combined Noninvasive Respiratory Support Therapies to Treat COVID-19. *Respir. Care* 2021, 66, 1831–1839. [[CrossRef](#)] [[PubMed](#)]