Letter to the Editor

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Early Use of High Flow Nasal Cannula in Postextubation Period: Can It Reduce Reintubation Rate?

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We have read with much interest the article by Sim et al.[1] who observed that cardiac dysfunction was not associated with increased reintubation rate within 72 hours when high flow nasal cannula (HFNC) was applied immediately after planned extubation. The study is indeed a valued addition to medical literature. However, we would welcome the authors' views for clarity on certain aspects of their study.

First, the respiratory rate oxygenation–heart rate (ROX-HR) index appears to be a promising tool for early identification of patients at risk of HFNC failure in the post-extubation period[2]. The ROX index is calculated as peripheral oxygen saturation (SpO_2) over the fraction of inspired oxygen (FiO_2), divided by respiratory rate. As the authors have measured parameters such as SpO_2, FiO_2, and heart rate, we are curious whether they had considered the ROX-HR index as well.

Second, monitoring N-terminal pro B-type natriuretic peptide (NT-proBNP) levels can predict post-extubation respiratory distress during spontaneous breathing trial (SBT)[3]. A high sensitivity (95%) and a negative likelihood ratio of 0.09 was observed with the cut-off value of NT-proBNP levels of no greater than 1,000 pg/mL[3]. We wonder whether the authors had considered monitoring NT-proBNP levels.

Third, some patients on dobutamine support might show elevated ejection fraction despite their underlying cardiac dysfunction. Combined monitoring of BNP and echocardiography can identify cardiac dysfunction patients with better accuracy than either method alone owing to the marked additive diagnostic value[4].

Fourth, certain independent predictors for reintubation at any time during hospitalization, such as higher simplified acute physiology score (SAPS II score) on admission, higher secretion burden (either suctioning frequency or the total amount of secretions in 24 hours), higher minute ventilation (either immediately before or during the SBT), a higher number of previously failed SBTs prior to extubation, and lower diastolic pressure, were already identified[5]. HFNC is associated with lower secretion and less discomfort compared to non-invasive ventilation (NIV). The authors assessed disease severity with Acute Physiology and Chronic Health Evaluation (APACHE) II score and Charlson Comorbidity Index. It would be further interesting to know whether they have also evaluated the SAPS II score and the secretion burden.

Fifth, the early indicators of HFNC failure are the persistence of tachypnoea with a respiratory rate higher than 30 breaths/min, thoraco-abdominal asynchrony, and lack of improvement in oxygenation at 30 minutes after initiation of HFNC[6]. It would be further interesting to know whether the authors had considered using these parameters for the prediction of HFNC failure.

Lastly, the estimated inspiratory collapse of the inferior vena cava (IVC) is reduced by more than 20% during HFNC therapy[7] owing to the continuous positive

airway pressure effect[8]. Furthermore, HFNC can cause a reduction of right heart preload, and improvement in the respiratory rate in heart failure patients[7]. We are curious to know whether they had considered measuring IVC collapsibility to corroborate the beneficial effect of HFNC in patients with cardiac dysfunction.

In the current study, the authors have found post-extubation HFNC application to be an effective modality in preventing reintubation in cardiac dysfunction patients. We hope that clarity on the above-mentioned points would add to the evaluation of outcome parameters of this study and further studies, especially well-designed, high-powered, randomized control trials on the effectiveness of HFNC as a post-extubation bridging therapy in the subset of patients with cardiac dysfunction can be immensely useful.

Authors' Contributions

Conceptualization: Mukherjee P, Mandal M, Esquinas AM. Formal analysis: Mukherjee P, Mandal M, Esquinas AM. Writing - original draft preparation: Mukherjee P, Mandal M, Esquinas AM. Writing - review and editing: Mukherjee P, Mandal M, Esquinas AM. Approval of final manuscript: all authors.

Conflicts of Interest

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

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References

1. Sim JK, Choi J, Oh JY, Min KH, Hur GY, Lee SY, et al. Cardiac dysfunction is not associated with increased reintubation rate in patients treated with post-extubation high-flow nasal cannula. Tuberc Respir Dis (Seoul) 2022;85:332-40.
2. Goh KJ, Chai HZ, Ong TH, Sewa DW, Phua GC, Tan QL. Early prediction of high flow nasal cannula therapy outcomes using a modified ROX index incorporating heart rate. J Intensive Care 2020;8:41.
3. Ouanes-Besbes L, Dachraoui F, Ouanes I, Bouneb R, Jalloul F, Dlala M, et al. NT-proBNP levels at spontaneous breathing trial help in the prediction of post-extubation respiratory distress. Intensive Care Med 2012;38:788-95.
4. Bajraktari G, Pugliese NR, D'Agostino A, Rosa GM, Ibrahimi P, Percuku L, et al. Echo- and B-type natriuretic peptide-guided follow-up versus symptom-guided follow-up: comparison of the outcome in ambulatory heart failure patients. Cardiol Res Pract 2018;2018:3139861.
5. Miu T, Joffe AM, Yanez ND, Khandelwal N, Dagal AH, Deem S, et al. Predictors of reintubation in critically ill patients. Respir Care 2014;59:178-85.
6. Sztrymf B, Messika J, Mayot T, Lenglet H, Dreyfuss D, Ricard JD. Impact of high-flow nasal cannula oxygen therapy on intensive care unit patients with acute respiratory failure: a prospective observational study. J Crit Care 2012;27:324.e9-13.
7. Roca O, Perez-Teran P, Masclans JR, Perez L, Galve E, Evangelista A, et al. Patients with New York Heart Association class III heart failure may benefit with high flow nasal cannula supportive therapy: high flow nasal cannula in heart failure. J Crit Care 2013;28:741-6.
8. Esquinas AM, Papadakos PJ. High-flow nasal cannula supportive therapy in chronic heart failure: a partial or completed "CPAP-like effect"? J Crit Care 2014;29:465.