



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

<https://doi.org/10.4046/trd.2022.0161>
 ISSN: 1738-3536(Print)/
 2005-6184(Online)
 Tuberc Respir Dis 2023;86:65-66

Jae Kyeom Sim, M.D.  and Young Seok Lee, M.D., Ph.D. 

Division of Pulmonary, Allergy, and Critical Care Medicine, Department of Internal Medicine, Korea University Guro Hospital, Seoul, Republic of Korea



Copyright © 2023 The Korean Academy of Tuberculosis and Respiratory Diseases

We thank Mukherjee et al. for their comments on our study, in which there was no association between cardiac dysfunction and reintubation rate in patients following application of a postextubation high-flow nasal cannula (HFNC)¹. In their letter, the authors questioned whether we considered several factors relevant to extubation failure. Perhaps they were concerned about the possibility that these factors acted as confounding variables.

We were able to calculate the respiratory rate-oxygenation-heart rate (ROX-HR) index from our raw data². We only calculated the ROX-HR index after 2 hours of HFNC because the number of patients from whom the ROX-HR index could be obtained decreased over time. In the normal function group, the ROX-HR index was 9.99 (range, 7.23 to 14.80). However, the value was not available in five patients. In the cardiac dysfunction group, the ROX-HR index was 10.60 (range, 8.18 to 13.58). There was no significant difference in the ROX-HR index between the two groups ($p=0.517$). Thus, it was not a confounding variable.

Unfortunately, we did not have data regarding N-terminal pro-brain natriuretic peptide (NT-proBNP), the Simplified Acute Physiology Score 2 score, or the secretion burden. It was not feasible to analyze all factors known to predict extubation failure. The possibility of hidden confounding variables is an inherent limitation of a retrospective study, which is why a randomized controlled trial is needed.

With regard to NT-proBNP, 11% of patients were treated with renal replacement therapy on the day of extubation. Therefore, prediction of extubation failure using NT-proBNP would not be reliable in our study population. Patients with renal impairment were also excluded in the study³ cited by Mukherjee et al. Although secretion burden was not documented objectively, it was taken into consideration when assessing weaning readiness.

We do not understand the meaning of the third question. We have already addressed the issue of dobutamine. Moreover, the study cited by Mukherjee et al. focused on a treatment strategy, rather than the diagnosis, for heart failure⁴. Thus, it is not related to our study.

The fifth question is also difficult to understand. Tachypnea, thoracoabdominal asynchrony, and lack of improvement in oxygenation are signs of extubation failure rather than predictors thereof. They are not mentioned at all in the cited paper⁵.

Finally, we have also mentioned the study of Roca et al.⁶, which measured inferior vena cava (IVC) collapsibility to show a potential benefit of HFNC. However, measuring physiological parameters such as IVC collapsibility and confirming beneficial effects of HFNC were not the focus of our study.

Our study started with the recognition that the definition of high-risk extubation patients is broad, heterogeneous, and inconsistent and that it is not practical to

Address for correspondence
Young Seok Lee, M.D., Ph.D.
 Division of Pulmonary, Allergy, and Critical Care Medicine, Department of Internal Medicine, Korea University Guro Hospital, 148 Gurodong-ro, Guro-gu, Seoul 08308, Republic of Korea
Phone 82-2-2626-3256
Fax 82-2-2626-1166
E-mail avonlea76@korea.ac.kr
Received Dec. 8, 2022
Revised Dec. 9, 2022
Accepted Dec. 9, 2022
Published online Dec. 12, 2022



© It is identical to the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>).

apply noninvasive ventilation (NIV) in all cases. A recent study has shown that the beneficial effect of NIV in high-risk patients is dependent on obesity status⁷. Further studies are warranted to determine the appropriate level of postextubation respiratory support according to patient characteristics, which will improve patient outcomes and enable efficient use of intensive care resources.

Authors' Contributions

Conceptualization: Sim JK, Lee YS. Methodology: Sim JK, Lee YS. Formal analysis: Sim JK, Lee YS. Data curation: Sim JK, Lee YS. Writing - original draft preparation: Sim JK, Lee YS. Writing - review and editing: Sim JK, Lee YS. Approval of final manuscript: all authors.

Conflicts of Interest

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

Funding

No funding to declare.

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, Ibrahim 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. 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.
6. 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.
7. Thille AW, Coudroy R, Nay MA, Gacouin A, Decavele M, Sonnevile R, et al. Beneficial effects of noninvasive ventilation after extubation in obese or overweight patients: a post hoc analysis of a randomized clinical trial. *Am J Respir Crit Care Med* 2022;205:440-9.