Early use of HFNC in postextubation period: can it reduce reintubation rate?: Authors’ reply

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Dear Editor,

We thank Mukherjee et al. for their comments on our study, in which there was no association between cardiac dysfunction and the reintubation rate in patients following the 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 data (2). We only calculated the ROX-HR index after 2 h 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 (7.23–14.80), but the value was not available in five patients. In the cardiac dysfunction group, the ROX-HR index was 10.60 (8.18–13.58). There was no significant difference in the ROX-HR index between the two groups ($p = 0.517$), so it was not a confounding variable.

Unfortunately, we do not have data regarding N-terminal pro-brain natriuretic peptide (NT-proBNP), the Simplified Acute Physiology Score 2 score, or the secretion burden. It is not feasible to analyze all factors that are 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, the prediction of extubation failure using NT-proBNP would not have been reliable in our study population. Patients with renal impairment were also excluded in the study cited by Mukherjee et al. (3).

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 for, rather than the diagnosis of, heart failure and it is not related to our study (4).

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, and they are not mentioned at all in the cited paper (5).

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

From the outset, our study recognized that the definition of high-risk extubation patients is broad, heterogeneous, and inconsistent, and that it is not practical to apply noninvasive ventilation (NIV) in all cases. A recent study showed that the beneficial effect of NIV in high-risk patients is dependent on obesity status (7). 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.
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(1) Substantial contributions to the conception or design of the work: Jae Kyeom Sim, Young Seok Lee

(2) The acquisition, analysis, or interpretation of data for the work: Jae Kyeom Sim, Young Seok Lee

(3) Drafting the work or revising it critically for important intellectual content: Jae Kyeom Sim, Young Seok Lee

(4) Final approval of the version to be published: Jae Kyeom Sim, Young Seok Lee
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