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Response to “High-Flow oxygen as non-invasive ventilation may complicate timely intubation in patients with ARDS”

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We appreciate the thoughtful comments from Drs. Attebery, Lin and Remy (1) and thank them for the opportunity to comment in greater detail on the use of non-invasive ventilation among patients in our study.(2) We agree that it is an important question to assess whether initial attempts of non-invasive positive pressure ventilation (NIPPV) obscure acute respiratory failure requiring mechanical ventilation. In our study, we did not find evidence to suggest that the increased mortality observed in the late intubation group was explained by use of NIPPV. The proportion of patients that were trialed on NIPPV was the same in both the never intubated and late intubated groups (19%), and both bivariate and multivariate analyses accounting for NIPPV use did not attenuate the association between late intubation and death. Finally, an interaction test to determine whether the use of NIPPV modified the effect of late intubation on mortality was found to be non-significant.¹ However, more detailed studies on the timing, duration and patient response to noninvasive ventilation will be needed to further assess the role of NIPPV on clinical outcomes.

With regards to whether high-flow (HFNC) oxygen via nasal cannula may contribute to a delay in intubation, we agree that this is a very important question; however, our patients were enrolled prior to the widespread use of HFNC, making it unlikely that use of HFNC had any impact on our findings,.

Finally, the authors suggest additional variables including acid-base balance, PaCO₂, respiratory rate and ETCO₂ levels may be important factors to consider in determining whether a trial of NIPPV is likely to be successful. However, since only 20 initially non-intubated patients underwent an NIPPV trial in our study, our power to evaluate risk factors for NIPPV failure is very limited.

Overall, the authors' suggestions highlight a very important point about how future studies should be conducted. We need detailed, prospective studies with data collection surrounding timing of deterioration and timing and settings of the interventions used including level of positive end-expiratory pressure for NIPPV, flow levels for HFNC as well as patient related factors including comfort level and alertness. Rigorous prospective studies designed to evaluate these endpoints will be needed to adequately answer questions about what clinical risk factors predict success and failure in attempts to safely avoid intubation.

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