

Reviewer 2, v.1

Comments to the Author

I have carefully read the manuscript entitled “noninvasive ventilation failure in patients with hypoxemic respiratory failure: the role of sepsis and sepsis shock by Duan and colleagues.

In this manuscript authors attempted to demonstrate an association between non-invasive ventilation failure and sepsis throughout a prospective, observational, multicentre trial.

NIV failure is an important area of research because it is associated with poor outcomes in ICU patients.

Overall the MS is well-written. Below are several points that require the attention of the authors.

Introduction.

1. The authors wrote “The possible reason is delaying intubation associated complications”. I think authors would like to write “is a delayed intubation associated with complications.” In any case, this affirmation is particularly true and should be developed to emphasize the importance of not delaying intubation when caring patients with acute hypoxemic respiratory failure.
2. “a previous study has reported that severe sepsis was associated with NIV failure”. In fact, Meerer and colleagues reported that sepsis was one of the factors associated with failure by comparing the hospital outcomes of patients with NIV failure to those intubated primarily without prior NIV testing. However, to my knowledge, this is not the only study showing association between sepsis and NIV failure. For example, in a prospective multicentre cohort, Antonelli et al. included 354 patients with hypoxemic respiratory failure and reported an association between sepsis and NIV failure (OR 3 [1.7-5.8]) (doi 10.1007/s00134-001-1114-4). I recommend the authors to update their MS accordingly.

Methods.

3. page 6. “NIV was managed by attending physicians, respiratory therapists and nurses.” Levels of knowledge between physicians, respiratory therapist and nurses could vary largely. An experimented team providing NIV is necessary to avoid failure. I suggest that authors add data about level of knowledge of their team providing NIV in the selected ICU.
4. “When the respiratory failure was reversed, the liberation from NIV was considered”. Could the authors precise which criteria were used to consider a reversed respiratory failure.
5. Page 7. Intubation criteria. I suggest the authors to better define intubation criteria. Hemodynamic instability. How was defined hemodynamic instability? Loss of consciousness. Which scale was used to measure it? Were the intubation criteria strictly predefined before the study began and were they the same in all ICUs?

Results.

6. "a total of 582 patients were enrolled." How many patients were screened for the study and how many patients were admitted in the ICUs during the study period? I suggest adding a study flowchart to know how many patients were eligible, and how many were actually included, in order to rule out or not a recruitment bias.

Discussion.

7. "To our knowledge, this is the first study to detailedly report the characteristics and outcomes of NIV in patients with sepsis and septic shock." This is not the main objective of the manuscript. The first sentence of the discussion must report a global answer to the main objective of the present study.

8. "In no-sepsis, the NIV failure was 61.1% [...] the majority as cardiogenic pulmonary edema" In my opinion, you could not compare respiratory failure due to "de novo" acute respiratory failure to respiratory failure due to acute cardiogenic pulmonary edema. Page 9, authors say that "the use of NIV was controversial in hypoxemic respiratory failure". This affirmation is true, but does not include cardiogenic pulmonary edema. Consequently, I think cardiogenic edema should have been excluded from the study.

9. p10 "However, few studies have reported the associations between sepsis and NIV outcome" cf comment #2 + doi : 10.1186/1471-2466-14-19. The new data provided in our manuscript is to compare sepsis to sepsis shock.

10. p11. "And [pulmonary infection] became an independent risk factor for 28-day in-hospital mortality. The reasons were unclear." Maybe, this is due to ARDS?

11. Tables are clear and pleasant to read.

12. References are clear and correctly reported in the manuscript.

In conclusion, I suggest the authors to better explain their methodology and to highlight the data that are novel in their manuscript.