Reviewer's report

Title: Non-invasive mechanical ventilation in patients with diffuse parenchymal lung diseases

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Reviewer: Miguel Ferrer

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GENERAL COMMENTS

The authors have reported a retrospective series of consecutive patients with diffuse interstitial lung disease (DILD) treated with non-invasive ventilation (NIV) for an episode of acute respiratory failure (ARF). They have compared causes potentially reversible such as pneumonia or acute heart failure (Group A) and acute exacerbations of fibrosis (Group B). They found a better response to NIV in terms of oxygenation in Group A only, with similar clinical efficacy, assessed by a composite outcome that included intubation, extracorporeal membrane oxygenation or hospital death.

This series is valuable as there are no larger published series that describe the use of NIV in ARF in patients with DILD. There are, however, several important questions that deserve further clarification and discussion.

Major Compulsory Revisions

1. The manuscript would benefit from a revision by an expert in the English medical language

2. The term diffuse parenchymal lung disease is misleading since other diseases such as emphysema are also parenchymal diseases. I suggest the authors to use along the manuscript the term “diffuse interstitial lung disease (DILD)”, which fits better with the type of patients included in the study.

3. Inclusion of both pneumonia and acute heart failure. I agree with the authors in that causes of ARF potentially reversible would benefit better from NIV than other causes. However, there is extensive information in the literature illustrating that patients with acute heart failure respond to NIV much better than patients with pneumonia. Therefore, analysing together both groups of patients may lead to significant bias. Since there are only 5 patients with acute heart failure, I suggest the authors to compare patients with pneumonia with those with acute exacerbation of fibrosis. With only 5 patients with acute heart failure, a simple informative description of their outcomes would be enough.

4. Pooling together patients treated with CPAP and NIV. In spite of a case report from the authors (reference 16), CPAP and NIV should not be equivalent in patients with DILD and therefore analysing together both treatments may lead to significant bias. Additionally, CPAP was preferentially delivered with Helmet, while NIV with face mask. The authors are not clear when they define what
criteria was used to choose between both treatments (in page, lines 2 to 4 they should explain more clearly what treatment corresponds these criteria). This possible bias deserves a comment in the discussion, probably in the limitations section. In addition to compare the current Groups A and B, a comparison of the characteristics and outcomes between patients treated with CPAP or NIV would improve the manuscript.

5. In general, do not repeat most of the numeric values that are already shown in tables; just state the message or the information, since number can be read in the tables.

6. Discussion, last paragraph of page 14 and first paragraph of page 15. The authors suggest that NIV is a valuable option in patients with ARF triggered by acute heart failure or pneumonia; however, the can’t state this since actually their clinical outcomes were completely similar to those from acute exacerbation of fibrosis. In the same paragraph, the statement on the special indication of NIV in lung transplant based on the experience with patients with cystic fibrosis is somewhat speculative since there is no data to sustain this statement.

Minor Essential Revisions

a. Abstract, page 3, fourth line of results. “A significant …” or perhaps “No significant …”.

b. Information on patients with do-not-intubated decisions. The authors describe that the minority of majority with treatment failure were not intubated or did not undergo ECMO. Therefore, a clear description of patients with decisions to limit therapeutic effort or do-not-intubate is needed, both in the methods and the results.

c. Results, page 10, last line of paragraph 1). The sentence “A first diagnosis of DPLD was made in two patients” should be better explained.

d. Results, page 10, second paragraph). In the description of group C, only 7 cases as stated, while this group consisted of 10 patients.

e. Discussion, page 13, paragraph 2, line 3. At the light of the present results the authors can not state that NIV represents a valuable option since they did not demonstrate this treatment to be better than standard medical care and indeed there is no evidence on this. A better statement here would be that NIV is often used in this indication.

f. Discussion. In the same paragraph, line 9. The authors did not observe different NIV response according to the cause of ARF. They found immediate improvement of oxygenation in patients from Group A, but actually both groups had similar clinical response in terms of clinical failure rate. This statement should be tempered.

g. Table 3. There are no significant differences between the 3 groups regarding the outcomes; therefore the right column on comparisons between groups A and B is no necessary.

h. Figure 1. The clarity of this figure can be substantially improved. First, the scales in the Y axes can be amplified so that differences between groups and time points can be better observed; I may suggest either using breaks in these
axes and/or using SEM bars instead of SD, since SEM bars are shorter. Second, values at each time point can be put in the same vertical line and connect both time points with lines so that changes between before and 6-h after NIV can be more clear. Third, the entire population values can be deleted since this figure is intended to compare the 3 groups.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests