Reviewer's report

Title: Novel Approaches to Minimize Ventilator-Induced Lung Injury

Version: 1 Date: 27 December 2012

Reviewer: Hermann Wrigge

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Review of the manuscript with the title „Novel Approaches to Minimize Ventilator-Induced Lung Injury“ by doctors Fan, Villar and Slutsky.

MAJOR COMPULSORY REVISIONS

GENERAL COMMENTS: According to its website, BMC Medicine is “the flagship medical journal of the BMC series, publishing original research, commentaries and reviews that are either of significant interest to all areas of medicine and clinical practice, or provide key translational or clinical advances in a specific field”

I doubt whether the abovementioned manuscript actually falls within the scope of BMC Medicine. Given the expertise of the authors, I will limit my comments to the more general points below.

1. Nevertheless, I read the review whose authors are all renowned authors in the field of mechanical ventilation and acute respiratory distress syndrome with significant interest. I was surprised to find a rather boring review of a variety of options to reduce the risk of ventilator induced lung injury in mechanically ventilated patients. For the general medical reader, however, a brief introduction in the pathophysiology of VILI is missing (see below).

2. I was unable to detect any didactic structure leading the reader through the text. Before providing detailed information on physiological approaches for minimizing VILI, I think that an introduction into the pathophysiology of VILI would be essential for the readers of a general medical journal. The lack of such important background information is in contrast to detailed information, for example dosages, p-values or number of experimental animals in previous studies.

3. Also, some parts of the text are surprisingly casual, for example do the authors repeatedly state the slogan “no mechanical ventilation, no VILI”. The latter is simply incorrect considering the demonstration of VILI in spontaneously breathing subjects (cf. Mascheroni D, Kolobow T, Fumagalli R, Moretti MP, Chen V, Buckhold D. Acute respiratory failure following pharmacologically induced hyperventilation: an experimental animal study. Intensive Care Med. 1988;15(1):8-14.).

4. I strongly recommend restructuring the article. In my opinion, focusing on novel and less injurious ways to ensure gas exchange and pulmonary ventilation in acute respiratory failure and the underlying pathophysiology would be more
adequate for the readers of a general medical journal such as BMC Medicine.

5. I am surprised that the authors focus parts of their manuscript on NAVA, which at least in my opinion is a ventilation mode which has its strenghts in patients with increased WOB and weakness of the respiratory muscles (ventilatory muscle pump failure) rather than in ARDS patients. On the other hand, little is said about topics such as individualized PEEP titration, pulmonary imaging, recruitment strategies, HFOV, APRV ect.

MINOR ESSENTIAL REVISIONS

There are some typos:
Page 4, line 6 from top: “… in ARDS patients with ARDS.”
Page 11, line 5 from top: “To examine test the implications …”

Quality of written English: Acceptable

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.