Reviewer's report

Title: Morphological and molecular effects induced by repeated endotracheal suctioning in a rabbit model of ARDS

Version: 1 Date: 13 August 2013

Reviewer: Marcus J Schultz

Reviewer's report:

In a lung injury model in rabbits, Sakuramoto et al. studied morphological and molecular effects induced by repeated endotracheal suctioning. This study expands present knowledge on endotracheal suction in ARDS. The originality of this study is that it attempts to determine the effects of endotracheal suctioning over a longer period of time. Several issues need attention.

Major comments

1. Introduction – page 7: The authors defined research questions, but the hypothesis is lacking. A clear hypothesis could help to translate the research questions into a prediction of expected outcomes. Could the authors provide a clear hypothesis?

2. Methods # page 10: After induction of lung injury the fraction of inspired oxygen was set at 100%. This could result in resorption atelectasis and as such add to development of lung injury. Also, this is not easily translated into clinical practice. The authors should discuss this in the Discussion–section.

3. Results # page 13: Gas exchange in this study has been reported as PaO2, which is not sufficient: usually the PaO2 to FiO2 ratio (P/F) is used. Unless the fraction of inspired oxygen was set at 100% during the whole experiment.

4. Methods – The aim of this study was to assess the effects of repeated derecruitment due to suctioning in a model for ARDS; PaO2 levels (and thus P/F) were far higher than those in patients with ARDS. Then, were the animals suffering from lung injury at all, or at least as severe as with ARDS? The authors should discuss this in the Discussion–section.

5. Discussion – The authors advocate the use of closed endotracheal suction in patients with acute lung injury, however the authors should also mention the finding of previous reports that closed endotracheal suction seems less efficient in terms of secretion removal compared to open endotracheal suctioning (Lasocki Anesthesiology 2005).

6. Discussion – In addition, previous studies show both OS and CS to cause derecruitment. A recruitment maneuver immediately following endotracheal suctioning could be effective in counteracting the deterioration in PaO2 and lung volume. The authors could discuss prevention of arterial desaturation by performing recruitment maneuvers.

7. General – Overall the manuscript has English grammar and syntax issues.
Minor comments
1. Title – The title should describe better what was found in this study.
2. Introduction – page 6: “During these interventions, patients may be…” It is not clear which interventions are referred to.
3. Introduction – page 6: The authors wrote: “The reports suggest that OS induces alveolar de-recruitment” and refer to Wolf CCM 2007. Wolf however discussed endotracheal suctioning without disconnection from the ventilator, i.e., closed suctioning.

Level of interest: An article of importance in its field

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: none