Reviewer's report

**Title:** Effect of individualized PEEP titration guided by intratidal compliance profile analysis on regional ventilation assessed by electrical impedance tomography – a randomized controlled trial

**Version:** 1 **Date:** 22 Oct 2019

**Reviewer:** Elena Spinelli

**Reviewer's report:**

The major limitations of the study are the study population and (related to this) the sample size calculation. The study indicates that when the incidence of nonlinear compliance profile is very low (less than 20% in control group), an individualized PEEP titration approach results in few minor PEEP adjustment. As a consequence, the study might be underpowered to detect significant changes in ventilation distribution: the differences in regional gain and loss values might suggest that the individualized approach could decrease the loss of ventilation in the dependent areas (and the subsequent relative increase of ventilation in the non-dependent regions), but the effect is very limited, thus resulting in a not detectable difference in ventilation distribution (as indicated by not different TVv and TVd values between groups).

Even if "there are no data available concerning the variance of frequencies of compliance profiles", the sample size calculation should be based on the expected difference in the frequency of nonlinear intratidal CRS profiles, which is the study endpoint.

These drawbacks in the study design hinder the interpretation of the results.

**Additional comments:**

**Methods**

You state that "regional ventilation was measured via electrical impedance tomography (EIT, PulmoVista 500, Dräger 11 Medical) every 10 minutes for a duration of 2 minutes". It is not clear which f-EIT recordings were used and compared to assess tidal variation, gain and loss. Did you refer to images obtained at the beginning and at the end of surgery? Or did you average parameters from the comparisons of all images obtained at 10 minutes intervals?

Tidal variation is actually defined as the difference between gain and loss (ΔVT = TVG - TVL) (ref 28), while what you are reporting is the percentage of tidal volume going to ventral and dorsal areas, based on the fraction of impedance values in ventral (TVv) and dorsal areas (TVd).
Results:

You need to report p values for baseline characteristics (Table 1) to exclude confounding differences between the study groups.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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