Reviewer's report

Title: The effect of changing ventilator settings on indices of ventilation inhomogeneity in small ventilated lungs

Version: 1 Date: 22 May 2006
Reviewer: Frans B. Plötz

Reviewer's report:

General
This manuscript addresses an important issue in ventilation of newborns with respiratory problems, for instance surfactant deficiency. It would be very useful to have non invasive bedside techniques to evaluate lung volumes and ventilatory inhomogenity.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Although I think the question in the present study is relevant and well defined, I would have preferred if the authors would refer more often to the results of their previous work (Crit Care Med 2006)in which they studied the effect of both PIP and PEEP were increased in healthy and surfactant depleted animals. This would help to interpret the present results.

In the description of the animal model precise data about how the pigs were ventilated are lacking (PEEP, respiratory rate, PIP). As the ventilator settings are not mentioned I do not know what is exactly calculated. There is a essential difference between FRC and end expiratory lung volume (EELV). Was FRC measured at zero PEEP ?

In the animal model the influence of only one parameter (PIP) on indices was examined. This significantly limits the study. For example, the effect of different levels of PEEP would also be interesting. This gives a more extensive idea how indices are influenced by PEEP because PEEP is commonly applied in newborns with respiratory disease. Also studying these effects in a surfactant deficient animal model would be interesting ?

The computer program should be described in more detail and not in the statistics section.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

The title could be adjusted (comparable with the 3rd point of the key messages)
Abstract: nothing is said about within-subject variability of the measurements in the results.
Introduction: In the last paragraph of the introduction can any number be given for Vd/Vt. This can give a good reference for how to interpret all figures.
Results: Referal to figure 4 is missing.
Legends and figures: In figure 2 there is no legend, the arrows are confusing. The legend of figure 4 is not correct. The legend does not correspond with the curves.

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:
I declare that I have no competing interests