Reviewer’s report

Title: Lasting effects of short term non-invasive ventilation in the PACU on postoperative lung function in obese adults

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Reviewer: Onnen Moerer

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Lasting effects of short-term non-invasive ventilation in the PACU on postoperative lung function in obese adults

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The authors responded to all comments of the first review and improved the manuscript considerably.

Thus there are only few minor remaining aspects that need revision:

1. I suggest language editing by a native speaker.

2. Page 2, line 11: "Nevertheless it seems feasible that an early initiation of a NIV therapy immediately after surgery may be beneficial when lingering drug effects likely to peak and thus trigger pulmonary morbidity"

Complicated, make it two sentences.

3. Page 5, line 1: "Anaesthesia maintenance and respiratory settings were standardized as previously described [32]."

Comment: The authors refer to reference number 32. However, I doubt that reference number 32 fits!


Please carefully again if all citations within the manuscript correspond to the reference list.

4. General anaesthesia: I suggested shortening this part. However, instead of taking away the rather crucial information on mechanical ventilation I would have shortened the part on anaesthetic management. I think, that the paragraph can be reduced without loosing the information that is necessary for the reader.

I don’t want to interfere with your manuscript too much but; please take the following suggestion as a proposal that is not required to follow.

Missing Information: What was the mode of ventilation? Please provide the tidal volume target, to complete the information.

General anaesthesia
Twelve hours before surgery patients were premedicated with chlorazepat 20 mg per os. After pre-oxygenation for 3 minutes with an inspired oxygen fraction (FiO2) of 1.0, anaesthesia was induced with fentanyl (2-3 µg kg\(^{-1}\)) and propofol (2 mg kg\(^{-1}\)) and maintained with Remifentanil (0.1-0.2µg kg\(^{-1}\) min\(^{-1}\), ideal body weight) and propofol (3-6 mg kg\(^{-1}\) h\(^{-1}\)). Orotracheal intubation was performed after a single dose of rocuronium (0.5 mg kg\(^{-1}\) ideal body weight). The cuff pressure was adjusted continuously to 30 cmH2O by the respective anaesthetist using a continuous cuff pressure device (Rüsch GmbH, Kernen, Germany). Standard monitoring (pulse oximetry, non-invasive blood pressure and electrocardiography), monitoring of anaesthetic depth levels (BIS-EEG, BIS QuatroTM; Aspect Medical Systems, Freising Germany) was established. Recovery from neuromuscular blockade was monitored with a peripheral nerve stimulator (TOF-Watch, Organon Teknika Germany) by Train-Of-Four (TOF) assessment to ensure a ratio >0.9 before extubation [15].

During volume controlled mechanical ventilation respiratory rate was adjusted to maintain an end-tidal CO2 pressure of 4–4.7 kPa at a inspiration to expiration ratio of 1:1.5 and a positive end expiratory pressure of 10 cmH2O. A maximum peak pressure of 30 cmH2O was allowed. FIO2 during anaesthesia was 0.5.

Patients received dolasetron (25mg i.v.) and dexamethason (4mg i.v.) as PONV prophylaxis fifteen minutes before extubation. Before extubation oral cavity was suctioned. When the patient was fully awake and spontaneously breathing, the trachea was extubated without suction in a head up position with a positive pressure of 10cmH2O and a FiO2 of 1.0. Thereafter patients were transported to the post-anaesthesia care unit (PACU). Each patient nursed in the half sitting head up position for recovery during stay in the PACU.

5. Page 6, line 3: “Pain sensations were treated during course as previously described.”

Comment: The authors refer to a previous description but describe the pain management later on. This sentence can be deleted and any information on pain management left for the next paragraph where it is explained in detail.

6. Paragraph “spirometric measurements”, results section, page 10

It is written two times that the NIV group almost reached preoperative values. This is a bit disturbing and I suggest revising the text.

7. Results, paragraph „blood gas analysis“

„This improvement was located at 10-15% during PACU stay. Please check if this is a correct use of „located at“

8. results „pulse oxymetry”, page 9

- The paragraph needs revision; please follow the time line when presenting the data. Right now the first hour difference follows the 24h hour difference.
- if you present the result it is enough to state that the data differed when you present the p-value, you don’t have to write that the results differed significantly if the p-value is shown since that is self explaining.
- During the first hour in the PACU (T0h-T1h; p<0.0001, Fig 1d) we found significantly differences within the study groups (ANOVA).
See suggestion above, but anyhow significant not significantly.

9. Discussion first paragraph:
- Anyhow atelectasis within the perioperative setting occurs within minutes mostly based on compression atelectasis and oxygen reabsobtion due to a high fraction of inspired oxygen (FiO2) [22].
Please delete „anyhow“, correct reabsorbtion and atelectasis

- Thus hypoventilation as well as lack of vigilance may contribute to overall lung impairment in the early postoperative period.
Why „Thus“ ?

- It seems feasible that an early initiation of a goal directed therapy focusing on postoperative respiratory mechanics may be beneficial.
How should the concept of an early goal directed therapy of early postoperative respiratory mechanics look like? I suggest deleting “early goal directed therapy” within this sentence.

10. Page 11, line 8: „Several studies have documented the favorable effects of NIV in acute respiratory failure, most having observed that numerous trials of NIV were often required, at times uninterrupted for several hours, before positive results became evident [25-29].“
Hard to read, not easy to follow, please revise.

11. Page 11, third paragraph: “There is no question about that NIV and CPAP improve gas exchange, minimize atelectasis formation, and increases functional residual capacity [4/32/33]. Moreover previous findings indicated that an early (pre-emptive) initiation of either CPAP or NIV therapy can reduce overall pulmonary complications but with the addition that study objectives were inhomogeneous and overall treatment times were up to 24 hours [25/26/34]. In contrast to this short term approaches or an initiation several hours after surgery failed to exhibit a clinical benefit [35/36].“
Hard to read, not easy to follow, please revise.

12. Overall comment for the discussion: The text flow is still not easy to follow the new paragraphs don’t fit.
Example, page 11, last sentence: “Additionally we do know that an...“
„Additionally”doesn’t rely fit. I suggest starting the discussion about the alternative approach using physiotherapy by beginning a new paragraph.

13. Figure 1 and 2: Please delete the outer frames of each of the four figures within Fig 1 and Fig. 2. Please try to adapt the length of the axis of each Figure and the distances in-between.
With best regards
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**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:**

I declare that I have no competing interests.