Reviewer's report

Title: Endotracheal Tube Cuff Pressure

Version: 1 Date: 8 July 2004

Reviewer: Alexander Dullenkopf

Reviewer's report:

General

The authors Sengupta et al. present a study (1) to show that estimation of endotracheal tube cuff pressure by finger palpation is inaccurate, (2) to evaluate cuff pressure provided during clinical routine, (3) to determine the volume of air required to achieve a cuff pressure of 20 cm H2O, and (4) to determine the compliance of the cuff-trachea system in-vivo.

Although the authors address an interesting topic related to patient safety and well-being, there are some major drawbacks in the methodology of the presented study.

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

1. Estimation of endotracheal tube cuff pressure by finger palpation
   In the Abstract’s Background section (p2) the authors state they tested the hypothesis that estimation of tube cuff pressure by finger palpation is inaccurate. If that is the main outcome mentioned in the abstract, the authors should include it in the Introduction section. Further on, the authors do not really assess this question. To test the mentioned hypothesis, the estimation by finger palpation should be compared to the obtained findings by manometer, or at least the anesthetist should have aimed at a given range or target for cuff pressure. The background of the study and the conclusion in the abstract (p2) should be redefined.

2. Evaluation of cuff pressure provided during clinical routine
   The finding that cuff pressure, if not monitored, exceeds safety margins by far is not that new. Sathiskumar and Young (Br J Anaesth. 2002 Mar;88(3):456) reported similar findings for anesthetized and ICU patients previously in a similar design. As the authors comment in the Introduction section (p4), increased awareness of over-inflation risks may improve clinical practice. The authors state in the Methods section (p5), that anesthesia providers were blinded to the nature of the study. However, the fact that a study related to cuff pressure takes place may per se have increased the awareness of the anesthesia providers. It therefore seems not reasonable to test the same anesthesia provider twice. It is not stated in the manuscript how often the same anesthesia providers were incorporated in the study. Further on, in the Author’s contributions section (p11) it is stated that SP, the first author, did many of the patients, in contrast to PM, SW, and AV, who took measurements. To me this means SP (not being blinded to the nature of the study) inflated or observed many of the tube cuffs, which pressures were later measured.
   The authors should restrict their findings to the first measurement concerning each anesthetist.

3. Volume of air required to achieve a cuff pressure of 20 cm H2O, and
4. Compliance of the cuff-trachea system
It is stated in the manuscript (p6) that in one of the tested hospitals Mallinckrodt tubes (what type exactly?) were used. If the data about required volume of air and cuff-trachea-compliance shall be of any value, it is necessary to provide more details about all tubes used during the study. Without these data it is not possible to replicate the presented work. It is further stated (p6) that muscle paralysis was achieved by succinylcholin or a non-depolarizing muscle relaxant. To compare different patients it is necessary to provide details about the administration of muscle relaxants and control of muscle paralysis, and about respirator settings and the patients lungs being mechanically ventilated or the patients breathing spontaneously, because this will potentially affect the compliance of the cuff-trachea system and therefore the volume of air required.

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

Background (p3, line 14): References for lower limit of cuff pressure should be given here.
Background (p3, line 20): In the reference of Lomholt et al., is 25 cm H2O given as lower or upper limit for cuff pressure? If it really is lower limit, as stated in the manuscript, please delete.
Background (p3, line 22): …to prevent aspiration and leaks past the cuff during aspiration… The sentence should be rephrased.
Methods (p5, line 4): Whereas it is interesting to compare different levels of anesthesia providers regarding their attention to cuff pressure, it remains unclear, why to mention and differ between the two different private hospitals. It is also of minor relevance to the reader to learn about the appointments of the anesthesiologist from the private hospitals at the University hospital, if they were included in the study only at their base institutions.
Methods (p6): Please, provide details, about the selection of the different tubes sizes according to patients characteristics.
Methods (p6, line 16): As the first cuff pressure in this study was obtained 60 min after intubation, I would recommend to define it as e.g. registered cuff pressure instead of initial cuff pressure.
Methods (p6, line 21): The authors state they completely emptied the cuffs by a syringe and noted the volume of air. How exactly did they determine the emptiness of the cuffs?
Results (p7, line 21): The authors state it interestingly that the amount of air required to achieve a cuff pressure of 20 cm H2O did not differ between tube sizes. In many tubes the only difference between certain tube sizes is the internal diameter, whereas, the same cuff may be applied on different tube shafts. With no given comparison of the patients having received the different tube sizes and no details about used tubes and cuff dimensions, it may well be possible, that comparable patient groups received tubes with comparable cuffs, what would make the results predictable.
Conclusion (p11): The conclusion should be rephrased. Cuff pressure should be monitored and corrected if necessary by a manometer.

Discretionary Revisions (which the author can choose to ignore)

References (p12): There are references cited in English, Chinese, Japanese, French, and German. This makes re-reading a little bit difficult for not so multilingual readers.

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:
None