Reviewer's report

Title: Smaller self-inflating bags produce greater guideline consistent ventilation in simulated cardiopulmonary resuscitation

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Reviewer: Peter Paal

Reviewer's report:

The authors present a prospective, randomized study evaluating ventilation quality, as defined by tidal and minute volume, with a 1600mL and a 1000mL ventilation bag in a bench model of a simulated and intubated cardiac arrest patient. The authors conclude that a smaller, 1000mL, results in better ventilation quality than a larger, 1600mL, ventilation bag.

Major Essential Revisions

The fact that smaller ventilation bags results in a lower tidal volumes is not new, as also stated by the authors.1 Additionally, other important factors of bag ventilation in a cardiac arrest patient, for instance, peak airway pressure, peak airway flow and inspiratory time should also be discussed.2-5 Please mention the compliance of your test lung, this is very important, because compliance varies within patients and also during cardiopulmonary resuscitation,6 and influences study outcomes of course.

The authors should include a power sample size. Based on which assumption did they decide to enroll 30 paramedics? What clinical relevant difference did they want to demonstrate with this study?

Also, I would like to know the year when this study was performed. For example, the authors cite the AHA 2000 guidelines (ref. 1), but now in 2008 we should base our clinical practice on the 2005 guidelines. Based on the discussion, I think the authors relied on the 2005 guidelines (10 ventilations/min, 6-7ml/kg tidal volume), thus the reference should be changed accordingly.

The term “suboptimal” is vague. It would be more correct to use hypo- and hyperventilation. Change “suboptimal” throughout the manuscript accordingly.

Minor Essential Revisions

Abstract

Page 2, line 11 and 4: Insert the model of the mechanical lung model and the ventilation bags in parenthesis.

Page 4, lines 7-8: Insert references for the quoted examples cardiac arrest, hypovolaemic shock and severe head injury.

Page 4, line 15: Ref. 5 referes to prehospital emergency physicians an not
paramedics.

Methods
Page 5, line 18: Name the model of the full-torso manikin in parenthesis. Every study should be reproducible, thus it is important to specify all study components.
Page 5, line 19: “measured” not “measure”
Page 5, line 20: Which test lung did you use, there are many models? Be precise.

Results
Page 7: Please add demographic data of your study cohort.
Page 7, lines 10-11; delete sentence “Optimal tidal volumes … inclusive.” This has been already said before. Avoid repetitions.
Page 7, lines 19-20; delete sentence “Optimal minute volumes…” It is again a repetition.

Discussion
Page 8, lines 9 and 10: Add 1000mL to smaller, for instance “… by using a smaller, 1000mL, self-inflating bag.”
Page 8, line 13: Delete ref. 7, it is mainly a review of the ref. 11 results. When citing articles try to cite original articles not reviews.
Page 9, lines 3-4: Delete sentence “While the smaller…”
Page 10, line 15: Insert a newer reference than ref. 17.
Page 10, lines 15-17: Delete sentence “Suboptimal ventilation…”
Page 10, lines 17-20: I do not agree with this sentence. Hypoxia and Hypercapnia have been shown to be independent risk factors for lower survival.7 Please change this part of the discussion.

Conclusions
Page 11, line 14 and 16; change to “… ,1600mL, adult self inflating bag” and “smaller, 1000mL, self-inflating bag”.

Figures
What is the scale and unit of the y-axis of Fig.2-4? Mention scale and unit, and also if the y-axis scale does not start at zero.
Delete Fig. 1, there is nothing scientifically new with it
Combine Fig. 2-4 in a single Figure (maybe three figures next to each other) to save space. Improve readability of figures. For example, the y-axis legend of Fig. 2 should be “n=23/30; 77%”, and the same for Fig. 3-4.
References


Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

No.
I declare that I have no competing interests