Reviewer’s report

Title: Association of neuromuscular reversal by sugammadex and neostigmine with 90-day mortality after non-cardiac surgery

Version: 0 Date: 30 Dec 2019

Reviewer: Christoph Czarnetzki

Reviewer's report:

I had the pleasure to review a retrospective trial on the association of neuromuscular reversal by sugammadex and neostigmine with 90-day mortality after non-cardiac surgery. I have few comments.

- Abstract, results. Please report if the 56% reduction is an absolute or relative decrease, and report also 95% confidence interval.

- Abstract, results. Some details on the population (age, type of surgery, ASA, elective/emergency) could increase the clarity of the manuscript.

- Methods. Please report if all patients underwent TOF monitoring before extubation.

- Results. Some details on the population (age, ASA, elective/emergency, major co-morbidities) could increase the clarity of the manuscript.

- Results. Can authors report the cause of death (e.g.; cardiac, pulmonary, cancer)?

- Results. There is an error in the results (Table 2). The mortality rate of 45/3906 (1.2%) is a subset of 26/4578; the number of deaths after matching should therefore be a maximum of 26/3906. However, the erroneously increased mortality is found in the table to the disadvantage of sugammadex, but in the text to the disadvantage of neo-stigmine. Can the authors explain where the number 45 comes from. Probably the numbers in the table have been twisted and the mortality rate of 45/3906 belongs to neostigmine (which is possible because 45/3906 is a subset of 365/61124).

However, in my opinion the result is highly suspicious for bias, as the mortality rate doubled after matching from 0.6% to 1.2% (= selection of unfavorable patients ...). This risk exists of course if one has to select almost 4000 patients out of 60000. The authors could perhaps have tried a 1:5 match (i.e. 5 neostigmine patients per Suggamadex patient) ...
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

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 recommend additional statistical review

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

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.
I received an unsrestrited grant from MSD for an investigator driven study (MagNeoSug and MagSug).

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal