Reviewer's report

Title: Changes of cerebral regional oxygen saturation during pneumoperitoneum and Trendelenburg position under propofol anesthesia: a prospective observational study

Version: 1 Date: 21 Feb 2019

Reviewer: Reviewer 2

Reviewer's report:

"REVISION ASSESSMENT FROM THE ACADEMIC PEER REVIEWER:

Has the author addressed the previous reviewer's concerns sufficiently for you to recommend the revised work as a technically sound contribution? No

Reviewer comments: The authors did revise the manuscript to answer some of the reviewers' concerns, but I still have some comments and suggestions.

This is an interesting study, and the questions the authors are trying to answer are important. However, I have some concerns about their reporting and conclusions. The paper would be greatly improved with English language editing. It is often challenging to follow their data, follow their arguments and conclusions. I'm not sure if this is largely due to the grammar, phrasing and choice of words or because of their actual results and conclusions.

The discussion section is too long and unfocused. Needs some major editing.

"Ten minutes after the onset of pneumoperitoneum, significant increase in the rSO2 was observed (left: 67.9 ± 6.3%, right: 70.6 ± 7.4%)." This only shows an increase on the right side. You should state this specifically. How do you explain the change on right but not on left?

"Was the conduct of anesthesia altered in any way by the rSO2, or was this measure blinded to the anesthesiologist?"

Answers)
Anesthesia was not altered by the rSO2.

The measurements were not blinded to the anesthesiologists." If the anesthesiologists were NOT blinded to the rSO2, how can you say the anesthesia was not altered by the results???

"but decreased to the baseline afterwards." This is vague. After what? After patient out of Tburg?

"rSO2 was correlated with MAP and PaCO2." Just say "correlated with MAP", not "was correlated"
"not aggravate cerebral oxygenation." "aggravate" is vague. Say what it did "did not worsen"

"in the cerebral oxygenation." Remove "the" Paper can be greatly improved with some English language editing.

"under propofol anesthesia:" Why do you note "under propofol" when the patients also received remi?

"with large titling angles" What is this?

"attack, and subarachnoid" I think you mean "or" not "and"

"general anesthesia with room air breathing" I think the mean before induction of general anesthesia while the patient breathed room air.

" The patient's lungs were mechanically ventilated in a volume controlled mode with a positive end-expiratory pressure of 3 cm H2O" Need to report tidal volumes, peak and plateau airway pressures as these can have effects of CO, central venous pressures and potentially alter cerebral blood flow.

Need to report baseline demographics of patients- BMI, baseline BPs (before DOS), age, presence or absence of pertinent comorbidities such as COPD, obesity, HF, HTN.

We also need a table with intraop results to know the blood loss, amt of propofol and remi administered, fluids given, urine output, amt of phenylephrine and ephedrine (different mechanisms which affect PVR, CO, central pressures, etc), FiO2. All of this info may affect and/or inform about intravascular volumes, perfusions pressures, etc.

Need to include a CONSORT diagram. ALL patients who were approached for study consented?

"and blood pressure measurement failure (bending of the arterial catheter) (n = 3)." How was this determined and at what time point? Weren't the anesthesiologists monitoring BPs intraop and wouldn't they have immediately been aware and fixed the problem?

Why didn't you measure rSO2 after patient returned supine and after pneumoperitoneum removed? This would be very valuable to corroborate that these interventions did or did not influence rSO2 rather than other aspects such as blood loss, fluids, effects of anesthetics, surgery, etc.

"Mean arterial blood pressure at 30, 45, and 60 min after the Trendelenburg position significantly decreased compared with that before the Trendelenburg position." This is not what one would expect. How do you explain this? Did the pts bleed? How was fluid being managed?

PaO2 decreased after the pneumoperitoneum, and increased after the Trendelenburg position. I would not expect the PaO2 to increase with T burg, especially since BP decreased. How to you explain this?
In the abstract you write this: "Ten minutes after the onset of pneumoperitoneum, significant increase in the rSO2 was observed (left: 67.9 ± 6.3%, right: 70.6 ± 7.4%)" but in the Results section of the paper (pg 10) you write this: "Ten min after the pneumoperitoneum, left and right rSO2 significantly increased to 69.6 ± 5.9% and 70.6 ± 7.4%." the numbers don't match up. This doesn't give the reviewer great confidence that you have accurately reported other data in your paper.

"Contrary to the previous study [9], one study reported that increase of intracranial pressure produced systemic hypertension [10]. Our study concurs with the latter study that MAP increased after the pneumoperitoneum" In the last sentence you refer to the "latter study" and say your findings concur. But, you talk about MAP increasing after pneumoperitoneum but from the "latter study" you reference you refer to intracranial pressure and systemic HTN. What do these 2 have to do with MAP and pneumoperitoneum?

On pg 12 you write: "In agreement with those studies, we observed that MAP increased by 16-17 mmHg at 5-10 minutes after the Trendelenburg position combined with CO2 pneumoperitoneum compared with that before the pneumoperitoneum. However, arterial blood pressure did not change immediately after the onset of the Trendelenburg position compared with that just before the Trendelenburg" But in the discussion section you write: "Mean arterial blood pressure before anesthesia was 95 ± 9 mmHg. As shown in Figure 1, it decreased to 67 ± 10 mmHg before the pneumoperitoneum, and increased significantly after the pneumoperitoneum. Mean arterial blood pressure at 30, 45, and 60 min after the Trendelenburg position significantly decreased compared with that before the Trendelenburg position." This is confusing. You should NOT introduce new data in your discussion section. Especially when you use that data to make specific points or arguments. Please be sure to report all data points of changes in MAP with timing of pneumoperitoneum and t Burg positioning. You need to help the reader follow the timeline.

"Therefore, it is assumed that the cerebral perfusion pressure did not change after the Trendelenburg position combined with that at the CO2 pneumoperitoneum" How can you make this assumption? Since CPP affected not only by MAP was also CVP and ICP?

"Cerebral autoregulation deteriorated with Trendelenburg position combined with pneumoperitoneum [18]." Are you making this statement based on YOUR study or ref 18? It is not clear as written.

"Thus, cerebral blood flow increased temporarily when the posture was changed from the supine to the Trendelenburg position." Again, the way this is written it is unclear if you are referring to the previously published papers you cite (ref 18 and 19) or if you are stating this based on your findings. (but you didn't measure CBF). The use of "Thus" is confusing.

"Therefore, rSO2 initially increased after the Trendelenburg position combined with CO2 pneumoperitoneum." The word "Therefore" makes this sentence confusing as well. See my comments just above.

"We recently reported that changes in rSO2 were well correlated with ventilation changes [20]" precisely why you have to report on ventilation parameters as I mentioned above.
"This study also detected that change of rSO2 was significantly correlated with the change of PaCO2." It was not "significantly correlated with"; it just "correlated with" Suggest: "This study also detected that changes in rSO2 significantly correlated with changes in PaCO2."

"respiration" should be "ventilation"

"Thus, rSO2 was increased along with" Again, just say "Thus, rSO2 increased along with"

"On the other hand, MAP decreased from 10 min after the Trendelenburg position." Here you give us an entirely new time for MAP changes. Before you reported on 5-10 minutes and then 30, 40, etc. It's very hard to follow your timelines of MAP which is important since the ultimate conclusion you are making with your study is that rSO2 correlated with MAP.

"over a long time period" Vague. Provide numbers

"Cerebral oxygenation status can be monitored by rSO2" This is confusing. Isn't cerebral oxygenation what rSO2 measures??? What do you mean by "oxygenation status?" Do you really mean cerebral oxygen CONSUMPTION? "status" is vague

"In addition, cerebral metabolic rate decreases after the induction of anesthesia that results in decrease in cerebral blood flow [22]" How does a decrease in cerebral metabolic rate decrease cerebral blood flow???

"This phenomenon may indicate that rSO2 is firmly affected by MAP and cerebral blood flow rather than arterial oxygenation status." Really? Under all conditions? If pt was hypoxic would this not affect rSO2?

"cerebral blood flow might depend on MAP." Don't we know this to be true already??

"When the cerebral perfusion pressure was below the lower limit of autoregulation, cerebral blood flow should have been changed directly with the fluctuation of MAP." This entire section is a bit confusing given that your patients NEVER had MAPs low enough to be "below lower limit of autoregulation.

"Forehead skin blood made an impact on rSO2" Again, the way you write these statements it is not clear that you are referring to information from study #23 rather than your own results.

"It has been reported that the extracranial contamination potentially affected rSO2 [23]. Forehead skin blood made an impact on rSO2 [23]. Trendelenburg position may cause venous stasis, which could result in the increase of venous portion of blood. Therefore, Trendelenburg position may have affected the relative arterial and venous content of the forehead skin blood.

Extracranial contamination might have influenced rSO2 in this study." Clearly this goes with the "limitations" section
"protection pads that supported the patient during the surgery, there was no space on the patient's head for the Doppler probe attachment." Really??

"Changes of rSO2 were along with the alteration of MAP and PaCO2, but did not correlate with the changes of HR, PaO2, or SaO2, indicating that arterial blood pressure is the critical factor in the cerebral oxygenation." Grammatically incorrect.

Legends for your figures are awfully long.

For Fig 1, the second graph has 2 plots but on the y axis, you only list O2 saturation (%)

You need to combine all the data points in the figures onto one figure so one can easily see how the various parameters intersect."

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

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.

Not relevant to this manuscript

Quality of written English
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