Reviewer’s report

Title: Intraoperative Bispectral Index Monitoring and Time to Extubation after Cardiac Surgery: Secondary Analysis of a Randomized Control Trial

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Reviewer: Stefano Romagnoli

Reviewer’s report:

Thank you for the opportunity to review the paper entitled “Intraoperative Bispectral Index Monitoring and Time to Extubation after Cardiac Surgery: Secondary Analysis of a Randomized Control Trial” by Vance et al. The main issue is focused on the potential effects of instrumental anesthesia depth monitoring (BIS) on extubation time and ICU length of stay after cardiac surgery. Before the paper can be reconsidered for publication, some important concerns should be addressed.

Major concerns

- Among the reasons for using an anesthesia depth monitoring is to limit the risk of intraoperative awareness (e.g. Prevention of intraoperative awareness with explicit recall in an unselected surgical population: a randomized comparative effectiveness trial. Mashour GA, Shanks A, Tremper KK, Kheterpal S, Turner CR, Ramachandran SK, Picton P, Schueller C, Morris M, Vandervest JC, Lin N, Avidan MS. Anesthesiology. 2012 Oct;117(4):717-25). Did the authors evaluated this issue? Some information about this point could be useful for the reader even if this is not the end-point of the study.

- Page 6 – Line 87 – “Anesthetic Technique and Interventions” # did the authors use halogenates during the CPB time?

- Page 8 – line 133-135 - “There are many factors that can prolong postoperative intubation following cardiac procedures, including: presence of an intra-aortic balloon pump (IABP), excessive bleeding, vasopressor use, preexisting lung disease, prolonged surgical time, or excessive depth of anesthesia.[4]”. The authors indicate “excessive depth of anesthesia” as one of the main factors influencing the intubation time. Classically, sedation is maintained during the post-operative phase in order to maintain mechanical ventilation while checking for bleeding, getting hemodynamic stabilization, and reaching the normal body temperature. How can be explained that the “depth of anesthesia” may influence the intubation time considering that “anesthesia” is interrupted at the end of surgery? The authors should explain this issue in the discussion.

- Table1:
  o The reviewer thinks that the “odds ratio” and “CI” columns are not informative for the reader and should be eliminated.
  o Ejection Fraction values were not tested. A p value should be provided.
Airway difficulties indicators are not useful for the reader. Please eliminate them.

- Page 9 - line 149 – “In non-cardiac surgery patients, initial efficacy studies suggested that BIS-monitoring may decrease time to extubation”. Monitoring the depth of anesthesia may influence the extubation time as anesthetics are withdrawn at the end of surgery. Cardiac surgery differs from all the other settings because the modern fast-track anesthesia is replaced with sedation. A difference in extubation time may be found by comparing “old” anesthesia techniques with the modern ones. Differently, it could be suspected that the type of sedation (benzodiazepines vs. propofol vs. opiates) may influence the extubation time. The reviewer believes that this is an important point that has to be discussed.

- Moreover, it could be interesting to evaluate the influence of BIS monitoring in the ICU on extubation time but as the authors state … “As BIS is not routinely employed in our ICU, it cannot be concluded from the current study whether BIS monitoring in the ICU is beneficial for earlier extubation time”.

Minor concerns

Page 2 – line 12: Intensive care unit (ICU) was already been mentioned (line 3 same page). Therefore, the acronym should be indicated the first time.

Page 4 – line51 - intensive care unit – please use ICU

Page 8 – line 127-128: “The median [inter quartile range (IQR)] times to extubation in the BIS-based alert and MAC-based alert groups were 307 [215 to 771] and 323 [196 to 730] minutes, respectively.” A p value should be indicated in the text and not only in the table.

Page 8 – line 130 “The median [inter quartile range (IQR)] times to extubation in the BIS-based alert and MAC-based alert groups were 307 [215 to 771] and 323 [196 to 730] minutes, respectively”. A p value should be indicated in the text and not only in the table.

Page 8 – line 132 “there was no difference between the groups for the secondary outcome of total postoperative hospital length of stay with median [IQR] times of 6 [5 to 8] days in each group (Table 2)”. A p value should be indicated in the text and not only in the table.

Page 8 – line 138 – “FFP” and “pRBC” should be indicated in extended form before using the acronym.

- Table 4: the measure unit is missing (minutes?)
- Table 5: the measure unit is missing (n/tot?)
- Table 5: the “odds ratio” and “CI” columns are not informative for the reader and should be eliminated.

Page 10 – line 183 – use the ICU acronym.

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:
I declare that I have no competing interests