Reviewer’s report

Title: Xenon for the prevention of postoperative delirium in cardiac surgery: study protocol for a prospective randomized controlled clinical trial

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Reviewer: Jan Poelaert

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This manuscript describes a well-designed protocol with respect to a randomized controlled and prospective study of xenon versus sevoflurane in patients undergoing cardiopulmonary bypass. The primary aim of the study is to find a difference in postoperative dementia after cardiac surgery.

Major remarks

1. The null hypothesis is not clearly stated.
2. One problem with xenon anesthesia is the depth of anesthesia and postoperative awareness. This will be assessed by BIS monitoring, though the indicated levels of xenon are quite low (less than 1 MAC). Both xenon and sevoflurane seem to be dosed quite low in the respective subsets.
3. All patients undergoing cardiac surgery will be enrolled. However, extensive valve surgery could hardly be compared with a patient with two-vessel disease in whom CABG has to be performed in terms of postoperative neurologic outcome.
4. Postoperative analgesia should be indicated in view of the potential postoperative hyperalgesia after use of remifentanil.
5. Anesthesia is extensively described. However, what about the anesthetic during cardiopulmonary bypass? Xenon will certainly not be continued. What impact has this on the anesthetic management?

Minor comments

1. Cisatracurium will be administered during induction of the anesthesia. However, no indication is provided concerning further curarization.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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

Declaration of competing interests:

none