Reviewer's report

Title: Efficacy of tranexamic acid in reducing blood loss in posterior lumbar spine surgery

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Reviewer: Jean Wong

Reviewer's report:

This manuscript describes a retrospective case control study of the effect of tranexamic acid on blood loss in posterior spinal fusion surgery for degenerative lumbar spinal stenosis and instability in adults.

The question posed by the authors is not well defined in the abstract, and needs to be revised.

The methods are not well described. Please see below.

There is missing data that should be reported. Please see below.

The manuscript does not adhere to relevant standards for reporting and data deposition.

The discussion needs to include the limitations of the study.

The title should be changed to: Efficacy of tranexamic acid in reducing blood loss in posterior lumbar spine surgery: a retrospective case control study

Major Compulsory Revisions

Abstract

1. Background

The background should be revised to indicate clearly what the purpose or objective of this study is.

2. Results

The actual blood loss with mean and SD, and the red cell transfusions and complications should be reported. In the methods, it was stated that ‘the amount of given red cell transfusions and complications associated with tranexamic acid were assessed’. Please add these results.

Background

1. The authors should state the usual blood loss expected with this procedure and transfusion rate. The lack of difference between the treatment and control group may be due to insufficient power depending on the expected blood loss.

2. In the fifth paragraph of the methods, the authors mention the use of erythropoietin, did any of the patients receive erythropoietin?
Methods

1. In the first paragraph of the background, the authors mention elderly patients, was older age a criteria for inclusion in this study? It is unclear whether there were any exclusion criteria for the study.

2. There is no mention of the period of time over which the surgery was performed. This is important and relevant since this study is a retrospective case control study. If the treatment group was compared to a retrospective control, there may be changes in surgical techniques, lowering of transfusion triggers, other changes in practice, etc. that may affect the outcomes measured.

3. In the second paragraph of the methods, the average age is reported, but the standard deviation should be added.

4. The authors should state the rationale for the doses of tranexamic acid used in this study, and rationale and/or references for administration of the 3 doses preoperatively, at 6 hours and 12 hours postoperatively. The time of administration of the preoperative dose should be stated.

5. It is unclear whether the patients were offered preoperative autologous blood donation.

6. The method of measuring intraoperative blood loss is not mentioned. Measuring estimated blood loss has previously been shown to be inaccurate. The authors should also determine the calculated blood loss.

7. The authors do not mention whether there were criteria for transfusing either autologous or allogeneic blood. The authors do not mention any co-morbid conditions that the patients in the two groups may have, as this may influence the decision to transfuse, e.g. history of cardiovascular disease.

8. In the background, the authors state that they “…observed the appearance of absence of preoperative complications that may be associated with the use of tranexamic acid”. However, in the methods, there is no mention of whether the authors reviewed the charts for adverse effects from tranexamic acid and what they considered as adverse effects.

Results

1. In the results and table 2, the authors have not reported the type of fluid administered intraoperatively, i.e. Crystalloid, type of colloid. This should be added to the table.

2. There is no reference to Table 1.

3. The authors have not reported the intraoperative blood loss in either the tables or the text of the results. This should be added.

4. The amount of blood transfused in each group should be reported, i.e. Number
of units or ml.

5. The authors do not report complications of tranexamic acid, however, it is unclear whether they reviewed the charts for complications/adverse effects.

Discussion

1. The first paragraph should be revised to summarize the findings of this study.

2. In the second sentence, the authors state “However no adequate randomization and blinding of the study participants took place”. Are the authors referring to their own study or the cardiac surgery studies? This needs to be clarified.

3. The authors do not state the limitations of their study, and the limitations of retrospective case control studies need to be clearly stated. The authors state that the lack of benefit may be due to ‘smaller overall blood loss of a pure posterior approach”, however the actual intraoperative blood loss was not reported. The lack of significant difference in blood loss may be secondary to the small numbers of patients, and minimal blood loss. The last sentence of the conclusions states that “…the routine use of tranexamic acid in posterior spinal surgery has to be carefully considered to avoid unnecessary complications”, however, the authors did not report any complications.

Minor Essential Revisions

1. In the background, 7th paragraph, last sentence, the sentence “Consequently aprotinin was taken of…” “of” should be changed to “off.”

2. In the methods, third paragraph, it is unclear what the authors mean by “…preoperative blood sample…”, this should be changed to “…preoperative hemoglobin…”

3. In the third paragraph of the discussion, first sentence “reduce” should be changed to “reduction”.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

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'