Reviewer’s report

Title: A simple clinical model for planning transfusion quantities in heart surgery

Version: 3 Date: 17 March 2011

Reviewer: Peng Wei

Reviewer’s report:

General comments: Simeone and co-authors proposed a multiple regression model for predicting packs of red blood cells (PRBC) transfused during heart surgery using preoperative and intraoperative variables. Prediction model was fitted using the training data and subsequently validated using the testing data. Patients whose PRBC were either over or underestimated were found to be associated with higher morbidity rate. Because the subject of this paper is outside my expertise, my review will primarily focus on the statistical methods and analyses. The overall statistical analyses were sound, but there are several points needing clarified. I have the following specific comments.

Major Compulsory Revisions

(1) Since the predictive model was fitted using the training data, the training and testing data should be treated differently when looking at the discrepancy between the estimated and actual PRBC. However, the authors pooled all patients (in the training and testing sets) together and divided them into Groups I, II & III (top of page 10). Could the authors justify it?

(2) Because the dataset used to build the predictive model is observational in nature, it’s not convincing to conclude causal effect based on association, i.e., unnecessary transfusions lead to increased morbidity rate. It could be that adverse events during heart surgery increased PRBC and subsequent postoperative morbidity. It seems that the authors tended to conclude that over transfusion led to increased morbidity. The authors need to elaborate more on this.

(3) Third paragraph in “Model design and validation” (page 7): the authors stated that “A regression model without an intercept was used…” This seems problematic to me. Unless the data have been centered, there should be an intercept term.

Minor Essential Revisions

(1) Last paragraph on page 8: “A statistical significance of 95% (p<0.05) was used for all statistical tests” should be changed to something like “p<0.05 was ascertained as statistical significant for all statistical tests”.

(2) Table 4: statistical tests of association between variables and three groups should be provided

Discretionary Revisions

(1) Table 4: it would be better if variables included in the final predictive model
Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.