Reviewer’s report

Title: Hospital variation in transfusion and infection after cardiac surgery: a cohort study

Version: 1 Date: 5 April 2009

Reviewer: Søren Paaske P Johnsen

Reviewer’s report:

In this follow-up study of 24,789 Medicare beneficiaries in Michigan who received coronary artery bypass graft surgery from 2003-2006, Dr. Rogers and colleagues examined variation in use of transfusion across hospitals and risks of adverse outcomes, including mortality and infection, associated with transfusion. The authors report substantial unexplained variation in use of transfusion across hospitals and an increased risk of adverse outcomes associated with transfusion. These findings are in accordance with numerous other studies and are as such not very surprising or original. This does not mean the work is without merit. The paper is well-written and clear, the data are recent and the statistical analyses appear sound. There are, however, also some important limitations – many of which the study has in common with the majority of the existing studies on this topic. More attention on these limitations and methodological problems are needed.

Major Compulsory Revisions:

1. The most important limitation is inadequate control for confounding. Important confounders that were not adjusted for include preoperative hemoglobin concentration, lowest hemoglobin concentration during surgery (which is an important confounder because it likely varies across hospitals, is strongly related to risk of red blood cell transfusion, and is an important prognostic factor), number of transfusions (it is quite possible that most of the risk is driven by patients who received large amount of transfusions, which would mean that they had large-volume blood loss, which is an important confounder), storage time of the transfused blood and timing of transfusions (if the date of transfusion is available, then only perioperative transfusions should be included since late transfusions may be due to an adverse event rather than the cause of an adverse event). The problem with the missing information on timing of the transfusion is underlined by the longer length of stay among patients receiving transfusion compared with non-transfused patients (page 8). This difference in length of stay could reflect that at least some of the transfusions were given to patients with complicated admissions and the transfusions could therefore just reflect rather than cause an increased risk of adverse outcomes.

2. Another limitation is the use of administrative data, which are often not highly accurate. No data is provided on the accuracy of the data used for this study. Please elaborate further on this important aspect.
Minor Essential Revisions:

1. Methods-, Results and Discussion sections: The readability of the paper could be increased by subdividing these sections and include relevant subheadings.
2. Statistical analyses: The analyses for aim one (i.e. variation in use of transfusions across hospitals) are not specified in the Methods section.

Which journal?: Appropriate or potentially appropriate for BMC Medicine: an article of importance in its field

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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