

Liberal versus restrictive transfusion thresholds after cardiac surgery: systematic review & meta-analysis

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Context: Restrictive transfusion threshold has been proposed as a method to circumvent the adverse complications of blood transfusion following cardiac surgery. Several randomised controlled trials (RCTs) have been funded to determine the effects of this postoperative strategy. Reviewing the literature and pooling suitably compatible data may add consensus to previous trial findings and better inform guidelines for postoperative management. The author is likely to draw on experience from a recent elective in Western Ukraine during presentation.

Methods: (population & design) Any adult patient who is in the immediate postoperative phase of cardiac surgery. Where haemoglobin or haematocrit values indicate transfusion requirement Randomised to receive transfusion if:

-a) they reach the conventional threshold ('liberal' group)

or

-b) they reach a pre-determined higher threshold ('restrictive' group)

Followed-up to determine whether adverse outcomes of blood transfusion are significantly different in either group. Systematic review and meta-analysis in accordance with the PRISMA guidelines. Search terms "(liberal versus restrictive) AND (blood transfusion) AND (cardiac surgery)" and in PubMed, Medline and Web of Science. Screened to collect RCTs that arranged their patients according to the PICO specified in the 'Patients' section. Trials reviewed and suitable data was pooled and analysed using Review Manager 5.3. Sensitivity analysis and bias-detection tools used to determine internal and external validity of statistical outcomes.

Results: Twelve RCTs were identified through screening. Data for four primary outcomes and eight secondary outcomes were sequestered and pooled for analysis. Primary outcomes: Stroke, AKI, Infection and Mortality. Secondary outcomes: Myocardial Infarction, Cardiac Arrhythmias, ICU Stay and Hospital Stay. All outcomes showed insignificant differences between liberal and restrictive transfusion threshold. ICU stay duration significantly less in liberal group, but dataset failed sensitivity analysis- discarded.

Conclusion: Excellent study quality examining the effect of restricted transfusion thresholds on the adverse outcomes of blood transfusion. Data is randomised, controlled, and peaks the hierarchy of evidence. Pooling of high-quality trial data affirms the insignificance of restricted transfusion thresholds on



the adverse effects of blood transfusion. Restrictive blood transfusion threshold does not reduce the adverse effects of blood transfusion. Conversely, restrictive blood transfusion threshold does not result in greater morbidity or mortality. Implications for both the well-resourced and the humanitarian setting.

