

Systematic review protocol: single-dose histidine-tryptophan-ketoglutarate vs. intermittent crystalloid or blood cardioplegia

J. James B. Edelman, Michael Seco, Ben Dunne, Shannon J. Matzelle, Michelle Murphy, Pragnesh Joshi, Tristan D. Yan, Michael K. Wilson, Paul G. Bannon, Michael P. Vallely, Jurgen Passage

Corresponding to: J James B Edelman. Department of Cardiothoracic Surgery, Sir Charles Gairdner Hospital, Nedlands, Western Australia; The Baird Institute, Sydney Medical School, University of Sydney, Sydney, Australia. Email: jjbedelman@gmail.com.



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Objectives

The purpose of this systematic review and meta-analysis is to assess the efficacy and safety of HTK compared with conventional crystalloid or blood cardioplegic solutions.

Methods

Participants

Adult patients undergoing cardiac surgery.

Interventions

Use of HTK will be compared with conventional blood or crystalloid cardioplegia.

Outcome measures

The primary outcome measure of interest will be mortality. Secondary outcome measures include myocardial protection (Tn), post-crossclamp arrhythmia, inotropic support, use of mechanical support, duration of operation, length of ICU stay, other end-organ dysfunction.

Search strategy

Studies that compare the use of HTK *vs.* blood or crystalloid cardioplegia for myocardial protection in cardiac surgery, randomized or non-randomized, will be selected. Large

case series of adult cardiac surgery with the use of HTK for myocardial protection but without a comparator, including more than 100 patients will be included in a separate analysis.

Electronic searches will be performed of Medline, the Cochrane Database of Systematic Reviews, Pubmed and EMBASE. Manual searches of reference lists will be used to identify any studies not found in the initial search. Only studies in English will be included. Abstracts, letters, and review articles will be excluded. Differences of opinion between reviewers will be discussed with a senior investigator.

An in/out form will be prepared to assess studies for inclusion or exclusion using predetermined inclusion criteria. The inclusion of studies will be assessed by two independent reviewers, with differences of opinion resolved by discussion with a senior investigator. A PRISMA flow-diagram will summarize inclusion/exclusion of studies. Level of evidence for each study will be reported to assess the quality of the evidence.

Statistical analysis

The relative risk (RR) will be used as a summary statistic. Both fixed and random effect models will be tested: should there be variations between studies then a random effect model will be used as the calculated ratios will have a more conservative value. Heterogeneity will be tested using χ^2 tests will be used to study heterogeneity between trials. If there was a substantial heterogeneity, the possible clinical and methodological reasons for this will be explored qualitatively.