Efficacy of hypertonic 7.5% saline and 6% dextran-70 in treating trauma: a meta-analysis of controlled clinical studies

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Authors' objectives
To examine the efficacy of hypertonic saline with and without dextran-70 for the initial treatment of trauma.

Searching
Meeting abstracts and conference proceedings. No details of database searches given. Letters were sent to international experts requesting information on unpublished studies.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were included.

Specific interventions included in the review
Hypertonic 7.5% saline (HS) alone or with dextran-70 (HSD), usually at a 6% concentration. In all cases, administration of 250 mL of HSD or HS was compared with a control group administration of 250 mL of isotonic crystalloid for the treatment of hypotension either in the field or at admission to the emergency department.

Participants included in the review
Adult patients (16 years or older) with a systolic blood-pressure of less than 100 mmHg associated with traumatic injury.

Outcomes assessed in the review
The outcome was survival until discharge or 30-day survival.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
None given, though all but one study was double-blinded. The authors do not state how the papers were assessed for validity, or how many of the authors performed the validity assessment.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis
How were the studies combined?
A fixed-effect meta-analysis using the Mantel-Haenszel method was undertaken.

How were differences between studies investigated?
Differences between the studies were investigated using sensitivity analysis.

Results of the review
There were 6 studies (n=719) of HS versus isotonic controls and 8 studies (1,233) of HSD. HS alone was not effective in improving survival compared to control, with a weighted mean difference of 0.6% in survival of the HS group, compared to the isotonic control group. The results with HSD showed an increase in survival in 7 of the 8 trials. The mean difference in survival rates favouring HSD over controls was 3.5% (p=0.14, two-tailed; p=0.07, one-tailed). The odds ratio was estimated to be 1.20 in favour of HSD (95% CI: 0.94, 1.57).

Authors' conclusions
This meta-analysis suggests a favourable survival benefit for HSD treatment of traumatic hypotension.

CRD commentary
It is unclear whether there are trials which have been excluded from this review, as few details of the literature search are included. No test for heterogeneity was carried out, though exclusion of the most influential studies in a sensitivity analysis did not markedly change the results.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.