

Hypertonic Saline (HTS) versus Standard (Isotonic) Fluid Therapy for Traumatic Brain Injuries: A Systematic Review

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Traumatic Brain Injury (TBI) is one of the foremost causes of mortality secondary to trauma. Poorer outcomes are associated with secondary insults, after the initial brain injury occurred.

The management goal of TBI is to prevent or minimise the effects of secondary brain injuries. The primary objective of this systematic review/meta-analysis was to assess the effects of Hypertonic Saline (HTS) compared to Standard Fluid Therapy (SFT) in the treatment and resuscitation of TBI patients.

We searched CENTRAL, MEDLINE (from 1966), EBSCOhost, Scopus, ScienceDirect, Proquest Medical Library and EMBASE (from 1980) in May 2010 and updated searches in February 2011. Data were assessed and extracted by two independent authors. Risk ratios (RR) with a 95% confidence interval (CI) were used as the effect measure.

The review included three RCTs (1184 participants) of which two were of high to moderate quality (1005 participants). HTS was not found to be associated with a reduction in mortality (3 RCTs, 1184 participants, RR 0.91, 95%CI 0.76 to 1.09) and morbidity in TBI patients. No significant improvement in haemodynamical stability was found whereas insufficient data were available to indicate a reduction in the intracranial pressure (ICP). In the HTS group, cerebral perfusion pressure (CPP) (MD 3.83 mmHg, 95%CI 1.08 to 6.57) and serum sodium level (MD 8 mEq/L, 95%CI 7.47 to 8.53) were higher.

Existing studies show no indication that HTS, in comparison to SFT, reduces mortality or morbidity after the occurrence of TBI. Against this backdrop, some uncertainties still exist in terms of the use of different concentrations and volumes of HTS, the timing of administration as well as the benefit in specific injury profiles. As a result, formulating conclusive recommendations is complex.