Effects of 23.4% Sodium Chloride Solution in Reducing Intracranial Pressure In Patients With Traumatic Brain Injury: Preliminary Study
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Bottom Line:
Hypertonic saline requires further studies as a safe and effective alternative to mannitol for treatment of traumatic brain injury (TBI).

Why It’s Important for Emergency Medicine:
Management of TBI is clearly a heavily debated topic in emergency medicine. Although there is no clear magic bullet, mannitol has long been the cornerstone of management. Hypertonic saline is also being explored as an option in patients who have a tenuous fluid status.

Major Points:
There was no difference between ICP reduction after 23.4% hypertonic saline (23.4NS) compared with mannitol (P=0.174). There was a difference between mean durations of effect of hypertonic saline (96 min) and mannitol (59 min) (P=0.016). No complications associated with hypertonic saline.

Design & Results:
Retrospective case control study; included patients with TBI that were treated with 23.4%NS, age >18 yrs, had TBI <12 hours of admission, required monitoring of ICP because of a Glasgow Coma Scale (GCS) <8 or post-op monitoring of ICP, CT head showing mass effect, patients with ICP that could not be controlled with mannitol. Of 141 patients with severe TBI, only 13 met inclusion criteria. 19 treatments of mannitol were given among 13 patients; 22 treatments of 23.4%NS were given. Average reduction of ICP: 15mmHg after 23.4%NS; 20 mmHg after mannitol

Criticisms:
Excruciatingly limited study with very small sample size. An overwhelming majority of the patients had terrible outcomes (i.e. vegetative state, death), thus no clear clinical benefit can be concluded. It is unknown how they measured the duration of decreased ICP in both treatment groups? Also, because HTS was often used as a refractory treatment after mannitol, it is unclear if the effect of HTS was additive. It appears as if the only benefit to using 23.4%NS is duration of decreased ICP, however that was not explicitly made clear in the study.

References: