

EFFICACY OF 20% MANNITOL VERSUS 3% HYPERTONIC SALINE IN DECREASING INTRACRANIAL PRESSURE IN THE PEDIATRIC AGE GROUP: A SYSTEMATIC REVIEW

Tracy Anne P. Victorino-Rivera, M.D., Marilyn Ortiz, M.D. FPPS, FPNA, FCNSP | Philippine Children's Medical Center

INTRODUCTION

There are no established guidelines preferring mannitol over hypertonic saline in managing increased intracranial pressure in children.

OBJECTIVE

Assess the available data on the efficacy of 20% mannitol and 3% hypertonic saline in decreasing intracranial hypertension in the pediatric age group.

METHOD

- Search done through PubMed/MEDLINE, Cochrane and EMBASE yielded 280 studies.
- After applying the inclusion and exclusion criteria, a total of 7 articles were deemed eligible for assessment.

RESULTS

- Seven studies with a total of 1,892 pediatric patients met the eligibility criteria: three RCTs and four retrospective studies.
- Two randomized controlled studies showed statistically significant evidence that 3% hypertonic saline was superior to 20% mannitol in reducing ICP while two other studies had results that were insufficient to establish statistical significance.
- Length of stay was shorter in patients given hypertonic saline than in the mannitol group (SMD=0.68, 95% CI: 0.17 to 1.17, p=0.008)
- Relative risk of mortality was comparable in both groups 1.36 (95%CI: 0.70 to 2.62, p=0.36)
- More episodes of hypotension and rebound increase in ICP was seen with mannitol.
- Both agents reported occurrences of acute kidney injury, hemolysis and hyperchloremic metabolic acidosis.

CONCLUSION

- While both agents effectively decreased intracranial pressure, 3% hypertonic saline showed better results compared with 20% mannitol.
- Due to the limited number and heterogeneity of studies, a pooled analysis of the effects in ICP could not be done.

RECOMMENDATIONS

Larger prospective controlled studies using 20% mannitol and 3% hypertonic saline in the treatment of increased ICP in the pediatric age group are needed to render valid affirmations.

KEYWORDS

Mannitol, Hypertonic Saline, Intracranial Pressure