ORIGINAL RESEARCH

75. Prevalence and prognostic significance of sodium levels in adults with traumatic brain injury: A meta-analysis

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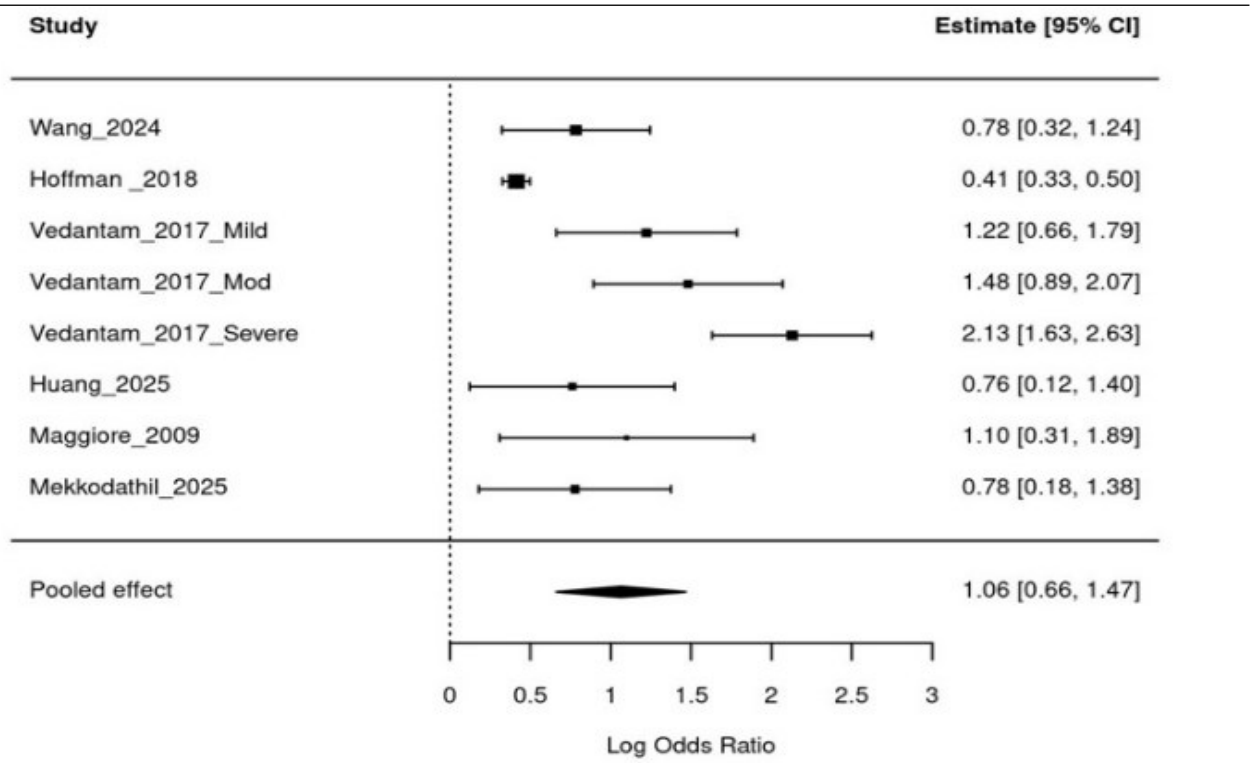
Background: Traumatic Brain Injury (TBI) is one of the leading causes of morbidity and mortality worldwide. Sodium disturbances occur commonly after traumatic brain injury and causes many complications. This study is aimed at determining prevalence and prognosis of sodium levels in adult with traumatic brain injury.

Methods: A meta-analysis was performed following PRISMA guidelines. A systematic search was conducted at PubMed and Google Scholar from 2009 to 2025 for studies reporting sodium disturbances in adults with traumatic brain injury. Risk of bias was assessed using Newcastle-Ottawa Scale (NOS).

Results: A total of 8 studies with 94,874 patients were involved. Data was analyzed using R software (version 4.5.1). The studies suggest that hypernatremia was associated with increased risk of mortality (OR 2.9 [95% CI 1.939-4.332] p-value <0.0001, I^2 = 85.05%) and worsened outcomes. Limited data on hyponatremia is not sufficient to make pooled analysis but few studies suggests that it is associated with increased severity and worsened outcomes.

Conclusion: Hypernatremia is associated with increased risk of mortality and poorer outcomes. This study emphasizes the importance of incorporating sodium monitoring into standardized management protocols.

Figure 1. Forest Plot Showing Association Between Hypernatremia and Mortality in Adults with Traumatic Brain Injury. Mod = Moderate, CI = Confidence Interval. The Figure was Generated Using R.



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