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## Serum sodium values and their association with adverse outcomes in moderate-severe traumatic brain injury (TBI)


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## SERUM SODIUM VALUES AND THEIR ASSOCIATION WITH ADVERSE OUTCOMES IN MODERATE-SEVERE TRAUMATIC BRAIN INJURY (TBI)

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### **Abstract:**

Hypernatremia in neurocritically ill patients has been associated with worse neurological outcomes. There may, however, be a treatment effect from osmotherapy combating herniation and hyponatremia, which in turn may exacerbate brain edema, resulting in iatrogenic sodium repletion. In moderate-severe TBI, serum sodium (sNa) disturbances are common, but their impact on patient outcomes is unknown. In a prospective observational cohort study of 144 consecutive moderate-severe TBI patients admitted to a Level I trauma center (UMASS) over the period 11/2009–11/2011, we examined the association of mean, nadir, and peak sNa and hospital discharge neurological outcome (Glasgow Outcome Scale [GOS]). The mean age of this cohort was 51 years, 70% were men, and the median GCS and injury severity scores were 5 and 32, respectively. Using ordinal regression analysis, controlling for admission variables, length of ICU stay, severity of injury, presence of brain edema on head CT, administered hypertonic saline and mannitol, higher mean ( $p<0.001$ ), higher peak ( $p=0.01$ ), and higher nadir ( $p<0.001$ ) sNa values were significantly associated with worse outcome. Our findings suggest that higher sNa values are associated with worse neurological outcome, independent of treatment effect by osmotherapy.