

Diagnostic Performance of Urine Sodium to Assess Volume Status in hyponatremic patients: Data from a Prospective Study

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Background/Introduction:

Hyponatremia (serum sodium < 135 mmol/l) is common in hospitalized patients. Accurate assessment of extracellular fluid volume state (ECFV) is key to appropriate treatment, but remains challenging. Current European guidelines suggest urine sodium ≥ 30 mmol/l indicates euvolemia. However, this is based on scarce evidence and may be unreliable in case of diuretic therapy. This analysis aimed to determine the optimal urine sodium threshold for predicting ECFV in a large hyponatremic cohort.

Methods:

This preplanned secondary analysis used data from an international, randomized-controlled trial (2018-2024) of hospitalized adults with hypotonic hyponatremia (serum sodium < 130 mmol/l), randomized to either targeted plasma sodium correction or standard care.

Urine sodium was measured at baseline. Treatment response (≥ 2 mmol/l plasma sodium increase on day 1 following treatment based on initial clinical evaluation) served as the reference standard. ROC analysis was performed to detect the optimal urine sodium threshold.

Results:

Treatment response on day 1 was documented in 684 patients with available urine sodium values. The standard threshold of 30 mmol/L provided a high sensitivity of 85% and a specificity of 39% for identifying euvolemia. Raising the threshold to 40 mmol/l showed slightly lower sensitivity 75% but enhanced specificity to 54%. A higher cutoff of 50 mmol/L further decreased sensitivity (64%) with a modest gain in specificity (66%).

For identifying hypovolemia, the standard threshold of 30 mmol/l showed a sensitivity of 43% and specificity of 80%. Increasing the threshold to 40 mmol/l improved sensitivity to 58% but reduced specificity (69%).

Conclusion:

The standard threshold of 30 mmol/l for detecting euvolemia showed higher sensitivity at the cost of lower specificity. A higher threshold of 40 mmol/l offered a better compromise between sensitivity and specificity in this analysis.