

Hyponatremia in Children with Acute Central Nervous System Diseases

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Background: Hyponatremia is a common electrolyte disturbance and its potential neurological sequelae make its differential diagnosis mandatory before any therapeutic intervention.

Objective: The study was conducted to estimate the frequency of hyponatremia among children hospitalized with acute cerebral insult and to look for the possible causes of hyponatremia.

Design: Prospective case-control study.

Setting: Basrah maternity and children hospital.

Method: Case-control study performed on 150 children (87 boys and 63 girls), during 9 months (from the first of October 2003 till the end of June 2004). Their ages ranged from 2-108 months. Seventy five of them presented with acute central nervous system (CNS) manifestations, while the rest were considered as control.

Serum sodium, potassium, glucose and urea nitrogen were estimated and serum osmolality was calculated. In addition, urinary sodium, potassium, glucose, urea and creatinine determination was done, and urine osmolality was calculated.

Result: Eight of 75 pediatric patients (10.7%) with acute CNS diseases had hyponatremia syndrome, 3 of which were diagnosed with inappropriate antidiuretic hormone secretion. Another 2 patients showed signs of dehydration and evidence of cerebral salt wasting. In the remaining 3 patients the clinical and laboratory data were insufficient for further classification. The highest percentage of hyponatremia (3 out of 6 patients; 50%) was found in patients with intracranial diseases. Four out of 38 patients (15.5%) presented with CNS infections.

Mean serum levels of glucose, sodium and osmolality were significantly lower in all patients with acute CNS diseases compared with the control, while urinary urea and osmolality levels were significantly higher in those patients as compared with the control group.

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The study showed that there was a significant decrease in the mean serum level of glucose, sodium and osmolality in hyponatremic patients compared to non-hyponatremic patients. There was also a significant increase in urine sodium/creatinine ratio, urea, and osmolality in hyponatremic patients compared to non-hyponatremic patients.

The study has demonstrated that serum urea was significantly higher in patients with cerebral salt wasting compared to those with syndrome of inappropriate antidiuretic hormone secretion. In addition to that, the 3 groups of hyponatremia have significant differences in the mean urine sodium, urea, osmolality and serum osmolality.

Conclusion: From this study, we may conclude that hyponatremia is not uncommon in patients with acute central nervous system (CNS) insults. Serum sodium should be routinely monitored in these patients to enable early diagnosis and treatment of hyponatremia.

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