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LETTER TO THE EDITOR

In response to the article *'Transient Pseudohypoaldosteronism in an Infant: A Case Report'* by T. Latt et al., published in JAFES Vol. 33 No. 1.

Severe Hyponatremia in a 6-month-old Infant

Joanna Mańdziuk, Magdalena Okarska-Napierała, Ernest Kuchar

Department of Pediatrics with Clinical Assessment Unit, Second Medical Faculty Medical University of Warsaw, Poland

We want to congratulate Latt and colleagues on the article describing a case of a patient with transient pseudohypoaldosteronism.[1] Electrolyte derangements in course of this rare entity may be much more severe, as in our patient presenting with hyponatremia of 103 mmol/L. We feel that we can contribute to the topic by reporting our patient and discussing hyponatremia management.

We admitted a 6-month-old girl with irritability and 580 g weight loss within a month, presenting with severe dehydration. Laboratory tests revealed profound derangements: Na^+ 103 mmol/L, K^+ 7.8 mmol/L, Cl^- 76 mmol/L, metabolic acidosis and hyperaldosteronism (aldosterone 1857 ng/dl). Abdominal ultrasound revealed bilateral megaureters. Urine test confirmed a urinary tract infection (UTI).

Neurologic sequelae of both severe hyponatremia and its overly rapid correction are life-threatening. Therefore, careful therapeutic strategy must be provided. The safe rate of severe hyponatremia correction varies in the literature. Guidelines concerning adult patients with hyponatremia agree on the limit of correction being 10 mmol/L/d.[2] Nevertheless, for patients posing high risk for osmotic demyelination, such as patients with hyponatremia <110 mmol/L, recommendations for natremia correction vary from 8 mmol/L to 6 mmol/L/d.[2] Somers et al.,[3] in their review about hyponatremia in children recommend the rate of correction of 8 mmol/L/d, as grade 1a recommendation.

Another issue is achieving the target correction rate. Some authors suggest universal equations to predict the change in natremia. However, they can be inaccurate as they do not refer to dynamic sodium balance changes (due to, e.g., changing aldosterone and antidiuretic hormone release). The safest method of controlling natremia correction seems to be monitoring natremia every 4-6 hours, as suggested by Spasovski et al.,[4] who also state that in case of correction exceeding 10 mmol/L in the first 24 hours or 8 mmol/L in consecutive days, re-lowering serum sodium is warranted.

We want to present the scheme of severe hypovolemic hyponatremia treatment that may help clinicians dealing with this electrolyte imbalance.

Initially, increasing serum sodium by 5 mmol/l within 4 hours is frequently recommended,[5] which one can achieve following a simple equation:

sodium dose [mmol] = TBW x 5 = 0,6 x body mass [kg] x 5 = 3 x body mass

TBW – total body water

The preferred initial fluid for hypovolemic hyponatremia correction is 0.9% NaCl, with Na concentration of 15 mmol/100 ml, which means that preferred initial dose of 0.9% NaCl is 20 ml/kg/4 hours. By measuring sodium concentration after 4 hours one can assess patient's response to treatment and predict further change.

Further sodium correction should not exceed 8 mmol/L/d, which means 2 mmol/L/6 hours. This can be achieved by regular, every 6 hours, controls. Fluid sodium content should be guided by serum sodium, fluid volume – by patient's water need. In our patient, after initial quick correction of serum sodium we continued with hypotonic fluid (0.3% NaCl + 5% glucose) which guaranteed slower rate of correction as recommended. We corrected hyponatremia within 4 days (Table 1). The girl responded well to therapy, and after three months follow up, her physical and neurological development is appropriate for age.

Table 1. Consecutive sodium concentration values in our patient

Day	Hour	Sodium level [mmol/L]
1	19:33	103
1	22:05	107
2	06:30	110
2	09:40	115
2	15:16	118
2	20:00	107
3	00:06	117
3	06:18	119
3	12:42	120
3	16:44	123
3	19:40	126
4	00:01	125
4	13:38	127
5	13:36	136

To conclude, management of severe hyponatremia can provide a challenge for physicians. We feel that success can be achieved by regular, at least every 6 hours checking of serum sodium and adequate fluid therapy.

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