

It Is All About the Sodium

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Dear Editor,

Hypernatremia is a common electrolyte disturbance. However, severe, life threatening hypernatremia is a rare presentation among paediatric population. In contrast to hyponatremia, guidelines regarding treatment and the rate of correction of the high sodium levels is not standardized and is largely opinion based¹. Hence, there are lot of challenges encountered in the management of severe hypernatremia with choice of intravenous fluid, rate of correction and monitoring for complications.

In our case we describe severe hypernatremic dehydration in 11-year-old autistic male with acute oliguric renal failure caused by impaired thirst drive. He was referred to paediatric Emergency Department (ED) by General Practitioner (GP) with symptoms of upper respiratory viral illness, nausea, fatigue, and decreased fluid intake secondary to fear of vomiting.

Patient's behaviour has significantly changed in the last 24 hours, and he became irritable, intermittently delirious. His gait was ataxic. Vital signs revealed a tachycardia of 146 beats per minute and GCS of 14. Laboratory work confirmed hypernatremic dehydration with levels of serum sodium of 182 mmol/L on venous blood gas and 179 mmol/L on biochemistry laboratory report. His urea was 50.6 mmol/L. Glucose levels were normal. Physical examination revealed sunken eyes, dry mucous membranes, and unsteady gait. Basic blood tests were obtained, and he was commenced on the maintenance intravenous rehydration with Dextrose 5% in 0.9% Sodium Chloride at rate of 82ml/hour. Case was discussed with Nephrology team and we were advised to give 10ml/kg of 0.9% sodium chloride over one hour and then continue 50ml/hr. He has been urgently transferred to Intensive Care Unit (ICU) in tertiary centre for further management. In Paediatric Intensive Care Unit in a tertiary hospital, intravenous fluids were continued over a period of the next 72 hours and gradually sodium and urea improved. Regular bloods were done every 6 hours to monitor the decline rate.

Severe hypernatremia as described in this case is a life-threatening condition with mortality rate of maximum of 15%². Neuronal cell shrinkage can lead to the cortical bridging veins tear, and subsequently cause brain haemorrhage¹. Therefore, correction of hypernatremia has to be calculated carefully. Rapid correction of serum sodium can potentially lead to osmotic demyelination syndrome³. Hence, it is vital to establish whether hypernatremia is acute or chronic before the treatment. Rapid correction is acceptable and indicated if onset of hypernatremia is within the 48 hours. Thus, lowering serum sodium at rate of 10-12 mmol/L per day is advised. On the contrary, chronic hypernatremia has to be corrected slowly and gradually not exceeding the rate of 8-10 mmol/L per day¹. This case emphasises the challenges in treating an anxious child with autism, sensory processing disorder, and oral aversion for fluids and fear of intravenous interventions.

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