



Comment on “Excessive Sodium Bicarbonate Infusion May Result in Osmotic Demyelination Syndrome During Treatment of Diabetic Ketoacidosis: A Case Report” by Hsieh et al.

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Dear Editor,

We read with great interest the case report recently published in *Diabetes Therapy* by Hsieh et al. [1], describing a paradigmatic case of diabetic ketoacidosis (DKA) complicated by osmotic demyelination syndrome (ODS). The initial estimate was based on a plasma sodium concentration (P_{Na}) correction factor of 1.6 mEq/L every 100 mg/dL increase in plasmatic glucose above 100 mg/dL, but more recent evidence supports the use of higher correction factors (up to 4 mEq/L) [2]. This underestimation could be partially responsible for a liberal administration of sodium bicarbonate and hypertonic solutions during fluid therapy that led, despite the absence of hyponatremia, to an overly rapid P_{Na}

increase and to a fall in plasma osmolality (P_{osm}) and, eventually, to ODS.

Although we find the possible correlation between ODS and hypokalemia mentioned by the authors [1] very fascinating, we would like to emphasize the importance of proper management of DKA and hyperglycemic hyperosmolar state (HHS), with a focus on the fluctuations of P_{osm} and P_{Na} . In our previous works, we set up several mathematical models that allowed us to develop a quantitative approach for the treatment of HHS with the aim of limiting the risk of harmful complications, notably ODS [3, 4]. Recently we proposed a “pragmatic approach” that, in our opinion, could represent a valuable tool in treating HHS patients [5]. Our method is based on a simple algorithm that provides the P_{Na} expected on the basis of the water shift caused by hyperglycemia (P_{NaG}); the difference between the P_{NaG} and the measured P_{Na} allows one to stratify patients into three groups: exclusive water shift, sodium deficit greater than water losses, and absolute water deficit. Further formulas allowed us to quantify the alteration. These data are useful in determining the appropriate treatment and, in our opinion, a therapeutic approach based on accurate quantitative estimate of water and solute imbalances should always be recommended since it represents the most reliable strategy to prevent ODS.

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Compliance with Ethics Guidelines. This letter is a response to a previously published article and does not contain any studies with human participants or animals performed by any of the authors.

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