Sodium monitoring in infants

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Dear Editor:

We would like to congratulate Storey C et al. [1] for the excellent report entitled “Hyponatremia in children under 100 days old: incidence and etiologies”. The authors find that in infants 100 days of age or less this electrolyte disturbance is rather common, hospital-acquired in >85% and iatrogenic in >30% of the cases.

The report does not state the method used for sodium testing. This electrolyte is nowadays measured using either the direct or the indirect potentiometric technique [2, 3]. Direct potentiometry, which does not require sample dilution prior to measurement, is used in point-of-care blood-gas analyzers, while indirect potentiometry, which requires sample dilution prior to measurement, is used in main laboratory analyzers [2-4].

Clinicians usually assume that the mentioned techniques may be used interchangeably and generally place more trust in results from the main laboratory analyzers rather than point-of-care instrument [2-4]. However, the two methods show good agreement exclusively as long as circulating protein and lipid concentrations remain normal. Direct potentiometry is unaffected by altered protein and lipid levels but indirect potentiometry is affected [2-4]. Reduced levels of circulating proteins such as clotting and anticlotting factors and immunoglobulins, which is are common in newborns and infants, may spuriously increase sodium level. Between 2013 and 2018, we measured sodium both by direct and indirect potentiometry in 93 consecutive newborns infants with a community acquired infectious disease, as shown in figure 1. Median sodium level was lower by 3 mmol/L (P<0.001) when measured by the direct (134 mmol/L) as compared with the indirect (137 mmol/L) method. Similar results have been observed in adults and in a neonatal intensive care unit [5, 6].

Because of these substantial differences, pediatricians and neonatologists should preferentially use the direct technology or, at least, exclusively a single type of measurement, as recommended by many authorities [2-4].

References


