

Incidence and aetiology of infants presenting with low sodium and high potassium

Objectives

To ascertain the incidence, underlying diagnosis and outcome of infants presenting with low sodium and high potassium.

Background

Many neonatologists and paediatricians will encounter sick infants presenting with life threatening low serum sodium concentrations (hyponatraemia) and high serum potassium concentrations (hyperkalaemia) [1]. The differential diagnosis includes abnormally low aldosterone production or renal resistance to aldosterone action. Recognised causes of low aldosterone production include congenital adrenal hyperplasia (incidence 1:18 000 liveborn in UK 2007-9) [2], and renal resistance to aldosterone such as transient infantile pseudohypoaldosteronism due to urinary tract malformation or infections (incidence 1:13 200 liveborn in Ireland 2013-4) [3], or much rarer genetic pseudohypoaldosteronism.

Management of these children requires rapid diagnosis and correct treatment. No incidence data exist with respect to the frequency of this clinical problem and the underlying diagnosis.

The aim of our surveillance study is to ascertain the incidence and mechanism behind infants presenting with a low sodium and high potassium across Wales. We have defined low sodium as a serum or plasma sodium < 2.5 SD below the age-related mean together with a serum or plasma potassium > 2.5 SD above the age-related mean.

Criteria for inclusion, including the case definition

All infants <12 months of age with sodium <130 mmol/L AND Potassium >5.5 mmol/L

Information required on individual cases

We will ask clinicians to provide information about:

- Abnormalities detected on antenatal ultrasound screening
- Electrolyte values
- Emergency treatment received: e.g. potassium lowering agents, hydrocortisone
- Eventual underlying diagnosis
- Patient outcome at one month

Will patient confidentiality be maintained?

Yes, data will only be presented in an aggregated form.

Duration of study

2 years

Will additional contact with the patient be required?

No

Purposes for which the data collected will be used

To ascertain incidence, underlying diagnosis and outcome in infants presenting with low sodium and high potassium

References

1. Tse Y, Singhal N, McDonald L, et al. Problem solving in clinical practice: the sick infant with low sodium and high potassium. *Archives of Disease in Childhood - Education and Practice* 2021;106:23-27
2. Khalid JM, Oerton JM, Dezateux C, et al. Incidence and clinical features of congenital adrenal hyperplasia in Great Britain. *Archives of Disease in Childhood* 2012;97:101-106.
3. Kaninde, A, Grace, M, Joyce, C, et al. The incidence of transient infantile pseudohypoaldosteronism in Ireland: A prospective study. *Acta Paediatr.* 2021; 110: 1257– 1263. <https://doi.org/10.1111/apa.15688>

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