Nephrogenic syndrome of inappropriate antiuresis (NSIAD) managed with fluid restriction and salt supplementation

**BACKGROUND**

NSIAD is a rare genetic cause of hyponatraemia, due to activating mutations in the AVPR2 gene, encoding the Arginine Vasopressin Receptor Type 2, and located on Xq28. Of the fewer than 30 reported cases, most have been managed with fluid restriction and urea.

**OBJECTIVE:** Illustration of the presentation of a family with NSIAD and approach to management.

**METHODS:**

The clinical, biochemical and genetic findings of the case are presented.

**CASE HISTORY:**

- 14 month old boy presented with hyponatraemic seizures, following increased water intake the previous day
- Previously healthy and developmentally normal
- Initial investigations consistent with inappropriate antidiuresis (serum Na 114 mmol/L, serum K 3.7 mmol/L, urine sodium 51 mmol/L and urine osmolality 301 mmol/kg)
- Vasopressin level associated with hyponatraemia (Na 127 mmol/l) was low (1.7 pmol/l)
- Thyroid and adrenal function and imaging of the head, chest and abdomen were normal
- No evidence of intracerebral, respiratory or renal infection
- Water restriction was ineffective until salt supplementation was given as extra salt sprinkled on food

**DISCUSSION**

- Activating mutations of AVPR2 first described in 2005
  - 4 distinct mutations now identified
- Phenotypic variability described, with varying severity of symptoms and age at presentation, even in families who carry the same genetic mutation
  - 5 week old brother developed RSV bronchiolitis and right upper lobe pneumonia, requiring respiratory support, 5 months after presentation of the index case
  - Associated with hyponatraemia (serum Na 125, serum osmolality 272 mmol/kg, urine osmolality 191 mmol/kg)
  - Urea given for 24 hours whilst acutely unwell but otherwise managed with fluid restriction and oral/iv sodium supplementation
  - No genetic results to date
- Mother found to carry the same genetic mutation

**CONCLUSIONS:**

- This case illustrates the importance of considering NSIAD in children with hyponatraemia, with unexplained SIAD, low vasopressin levels and/or a positive family history
- Treatment is possible with water restriction but osmole replacement may also be required in some patients and this can be given as oral salt supplementation or urea
- The long term outcome is good