

Sodium chloride and water intake in children

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GUIDELINES

No recommendations possible based on Level I or II evidence

SUGGESTIONS FOR CLINICAL CARE

(Suggestions are based on Level III and IV sources)

- **Supplements of 4–7 mmol/kg/day of sodium chloride may be required to maximise growth in children with chronic kidney disease (CKD) and renal dysplasia (Coleman 1994).**
- **Sodium chloride supplements should be given to the limit of tolerance as indicated by raised blood pressure (Chantler 1988).**
- **Sodium chloride supplements may be added to a standard infant formula (¼ metric teaspoon of table salt = 17 mmol).**
- **A paediatric renal milk formula (Kindergen, Scientific Hospital Supplies, Baulkham Hills, Australia) contains 20 mmol/L sodium compared with standard infant formulae, which contain 7 mmol/L, or breast milk, which contains 6 mmol/L.**

Background

Many infants have CKD secondary to polyuric salt-wasting diseases. Sodium chloride excretion in these infants may exceed the intake from standard infant formulae or breast milk. Inadequate water and salt intake may contribute to growth retardation.

There are no data on the relationship between growth and water and sodium chloride depletion in children with CKD (Haycock 1993). However, it is known that 2 mmol/kg/day sodium chloride is essential for normal growth (Gamble 1953) and that growth failure associated with sodium chloride loss in pseudo-hypoaldosteronism may be reversed with sodium supplements (Raine & Roy 1962).

The objectives of this guideline are to review the available evidence for the benefits and adverse effects of sodium chloride and water supplementation in children with CKD or ESKD.

Search strategy

Databases searched: Medline (1996 to November Week 2 2003) and Embase (1980 to November 2003). MeSH terms for kidney disease were combined with MeSH terms and text words for sodium chloride and water consumption. The Cochrane Renal Group Specialised Register of randomised controlled trials was also searched for relevant trials not indexed in Medline.

Date of searches: 1 December 2003.

What is the evidence?

No randomised controlled trials examining supplementation with sodium chloride and water in children with CKD or ESKD were identified.

A prospective cohort study (Parekh et al, 2001) examined the effect on growth of sodium (sodium chloride and/or bicarbonate to 2–4 meq/100 mL of feed) and water supplements (0.3–0.5 kcal/mL) in 24 infants with CKD and compared the results with 12 infants receiving adequate nutrition from the literature (Abitbol et al 1993) and 42 from the US Renal Data Systems (USRDS). Children on this regimen maintained their height SDS at 1 and 2 years, unlike the comparison groups.

What do the other guidelines say?

Kidney Disease Outcomes Quality Initiative: No recommendations.

British Renal Association: Many children with CRF have renal dysplasia with renal tubular losses of salt and water that may require salt supplementation.

Canadian Society of Nephrology: No recommendations for children.

European Best Practice Guidelines: No recommendations for children.

Implementation and audit

Data on height, weight and head circumference in relation to energy, protein and sodium intake and the number of children who require nutritional supplementation by enteral feeding could be collected and analysed by paediatric renal dieticians.

Suggestions for future research

No recommendation.

References

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