

## **Micronutrient intake in children**

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**Author:** Elisabeth Hodson

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<p style="text-align: center;"><b>No recommendations possible based on Level I or II evidence</b></p>
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### **SUGGESTIONS FOR CLINICAL CARE**

(Suggestions are based on Level III and IV sources)

- **Supplements of water soluble vitamins are indicated in dialysis patients who are not receiving nutritional supplements.**
- **Supplements of vitamins A, B<sub>12</sub> and E are not indicated, since the dietary intake of these vitamins meets recommended daily intakes (RDIs) in children on dialysis.**

### **Background**

There are no data available on the optimum intake of vitamins and micronutrients in children with chronic kidney disease (CKD) or end-stage kidney disease (ESKD).

There remains controversy as to whether children with CKD or ESKD should receive routine supplementations of vitamins and micronutrients.

The objectives of this guideline are to review the available evidence for the benefits and adverse effects of supplementation of vitamins and micronutrients 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 micronutrients. 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 the intake of vitamins and micronutrients in children with CKD or ESKD were identified.

Dietary intake of water soluble vitamins is below 100% RDI in dialysis patients not on dietary supplements (Pereira et al 2000).

Children on dialysis and receiving additional nutritional supplements have similar dietary intakes of water soluble vitamins to healthy controls (Kriley & Warady 1991).

Adult multivitamin preparations given to children on dialysis may result in dietary intake and serum levels of some vitamins that exceed the levels in healthy controls (Kriley & Warady 1991, Pereira et al 2000).

With vitamin supplements designed for renal paediatric patients, daily intake and serum levels of water soluble vitamins are similar in dialysis patients receiving nutritional supplements to those in healthy controls (Coleman & Watson 1991, Coleman & Watson 1992).

Dietary intake of vitamins A, B<sub>12</sub> and E meets RDIs in children on dialysis, whether they are receiving (Coleman & Watson 1991) or not receiving nutritional supplements (Kriley & Warady 1991). Serum levels of these vitamins are normal or elevated without supplements (Coleman & Watson 1991, Kriley & Warady 1991).

Dietary intakes of copper and zinc do not differ from those in healthy children but are lower than the RDI (Coleman & Watson 1991, Rättsch et al 1992). This is of uncertain clinical significance.

Dialysis patients receiving a paediatric vitamin and mineral supplement achieve serum levels of copper and zinc within the normal range for healthy children (Coleman & Watson 1992).

## **Summary of the evidence**

No guidelines based on Level I or II evidence can be formulated.

## **What do the other guidelines say?**

**Kidney Disease Outcomes Quality Initiative:** Children on dialysis should receive 100% recommended intake of vitamins and micronutrients. Intake and serum levels of water soluble vitamins; zinc and copper should be monitored every 4-6 months and supplementation considered if the intake is below 100% recommended intake, if serum levels are low or if clinical evidence of deficiency exists (Evidence and Opinion). There are no recommendations for children with CRF.

**British Renal Association:** No recommendations for children.

**Canadian Society of Nephrology:** No recommendations for children.

**European Best Practice Guidelines:** No recommendations for children.

### **Implementation and audit**

The number of children on dialysis who receive a vitamin supplement with or without nutritional supplements and the supplement used could be assessed through the paediatric renal dietitians and the Australian & New Zealand Paediatric Nephrology Association (ANZPNA).

### **Suggestions for future research**

No recommendation.

## **References**

Coleman JE, Watson AR. Micronutrient supplementation in children on continuous cycling peritoneal dialysis (CCPD). *Adv Perit Dial* 1992; 8: 396–401.

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