

Bone disease and growth 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 evidence)

- **Children with chronic kidney disease (CKD) or end-stage kidney disease (ESKD) should be monitored regularly for renal osteodystrophy, and treated with vitamin D if this develops.**
- **Calcitriol or synthetic analogues are suitable for use in children. Calcitriol liquid is available in Australia through the SAS scheme, being imported from New Zealand. Alternatively, the fluid can be aspirated from capsules. The parathyroid hormone (PTH) level should be maintained under a level twice the upper limit of the normal range.**

Although Level I or II evidence is not available, published clinical studies do not support the notion that correcting biochemically evident secondary hyperparathyroidism improves linear growth in children with CKD.

Severe renal osteodystrophy associated with radiological changes is associated with short status (Betts & Magrath 1974, Broyer et al 1983, Hodson et al 1985).

Hodson et al (1985) studied bone histology, biochemistry, and height velocity in 18 children with CKD. Eight were treated with calcitriol, and 7 with ergocalciferol. No consistent change in growth rate was noted following treatment with either calcitriol or ergocalciferol despite improved bone histology. Chan et al (1994) compared calcitriol and dihydrotachysterol treatment in 82 children with CFR. There was no difference in linear growth scores with or without either therapy, or with either treatment.

Correction of secondary hyperparathyroidism and renal osteodystrophy prevents pain and deformity, but may also benefit linear growth in individual patients (Dent et al 1961, Chesney et al 1978). Improved growth velocity and reversal of bone lesions was reported in a case series of 6 pre-pubertal children, who were treated with calcitriol after receiving ergocalciferol for up to 26 months (Chesney et al 1978).

Background

Bone disease is a universal finding in children with CKD and may impair linear growth. Treatment of renal osteodystrophy aims to eliminate pain and deformity and is standard practice in children with renal insufficiency. A potential benefit of treatment of renal osteodystrophy is an improvement in linear growth, although there are no clinical studies to support this. The objective of this guideline is to review the available evidence regarding the effect of treating renal osteodystrophy on linear growth in children with CKD or ESKD.

Search strategy

Databases searched: MeSH terms and text words for kidney diseases were combined with MeSH terms and text words for bone disease then combined with the Cochrane highly sensitive search strategy for randomised controlled trials. The search was carried out in Medline (1996 – November Week 2 2003). The Cochrane Renal Group Trials Register was also searched for relevant trials not indexed in Medline.

Date of searches: 1 December 2003.

What is the evidence?

There are no reported randomised controlled trials that examine this question.

What do the other guidelines say?

Kidney Disease Outcomes Quality Initiative: No recommendations for children.

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

No recommendation.

Suggestions for future research

An interesting study would be to evaluate the use of high-dose pulse intravenous calcitriol therapy in comparison with daily oral treatment with respect to bone disease and growth.

References

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