Abstract

Eur J Clin Nutr. 1994 Feb;48 Suppl 1:S161-76; discussion S177.

Adequacy of dietary mineral supply for human bone growth and mineralisation.

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BACKGROUND: The evidence on the relationship between dietary mineral supply and bone development in children has been extensively reviewed. Data from children and primates suggest that overt deficiencies of Ca, P and Zn are likely to produce rickets and growth retardation, while the effects of Mg deficiency on human bone are unknown. The manifestations of marginal deficiencies are little understood.

DISCUSSION: The biological needs for Ca, P, Mg and Zn in childhood have been calculated based on mineral deposition rates, using published values for the mineral content of the human body, and on obligatory endogenous losses. As a rough guide, the estimated biological requirements for the Ca, P, Mg and Zn can be taken as 200, 100, 4 and 1 mg/d respectively. A comparison of measured daily intakes of children in developing countries with biological requirements was made. This revealed that P and Mg intakes were many times higher than estimated needs. Ca intakes at all ages were found to be close to the biological requirement for children in many Third World societies, before any allowance for possible poor absorption. Zn intakes approach estimated needs in breast-fed infants, particularly during weaning, but are 4-5 times higher in older children. Poor absorption from phytate-rich diets could affect Zn supply. Supplementation studies indicate that raising Zn intakes can increase height gains in certain vulnerable groups, such as infant and adolescent boys.

CONCLUSION: In conclusion, the evidence suggests that inadequate dietary intakes of Ca and Zn may contribute to linear growth retardation in children of developing countries but more research is needed.

PMID: 8005083