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Vigorous physical activity increases fracture risk in healthy children irrespective of bone mass

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Low bone mass is a determinant of fractures in healthy children. Small studies provide limited evidence on the association between ethnicity, birth weight, family size, socioeconomic status, dietary calcium intake, or physical activity and fracture incidence. Whether these determinants of fracture risk act through affecting bone mass or through other mechanisms is not known. The aim of this study [1] was to use a population-based birth cohort to confirm which variables are determinants of fracture risk and to further study which of these risk factors act independently of bone mass. Children were followed up from birth to 11 y of age. Maternal self-reported data were collected contemporaneously on early life factors, diet, puberty, and physical activity. These were linked to reported fractures between 9 and 11 y of age. Multivariable logistic regression techniques were used to assess whether these potential determinants were independent of, or worked through, estimated volumetric bone mineral density or estimated bone size relative to body size measured by total body DXA scan at 9.9 y of age.

A total of 2692 children had full data. One hundred ninety-three (7.2%) reported at least one fracture over the 2-y follow-up period. Children who reported daily or more episodes of vigorous physical activity had double the fracture risk compared with those children who reported less than four episodes per week (OR, 2.06). No other independent determinants of fracture risk in healthy children were found.

In conclusion, reported vigorous physical activity is an independent risk factor for childhood fracture risk. However, the interrelationship between physical activity, bone mass, and childhood fracture risk suggests that the higher bone mass associated with increased physical activity does not compensate for the risk caused by increased exposure to injuries.

1. Clark EM et al. J Bone Miner Res. 2008;23:1012-1022.

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Vigorous physical activity in children increases bone density and bone size relative to body size. However, fracture risk is increased in this condition, meaning that increased bone density and size do not compensate for the increased exposure to injuries.

Vigorous physical activity is therefore an independent risk factor for childhood fracture risk.