

思春期生徒における骨密度の増加スパートの 経年観察と運動及び食生活の影響

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Peak Bone Mineral Accrual Effected by Diet, Physical Activity and Other Lifestyle Factors in Adolescent Girls and Boys : A 5-year Longitudinal Study

by

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ABSTRACT

The purpose of this study was to investigate the age of reaching peak bone mass and the factors associated with bone mineral acquisition in pubertal girls and boys.

Two hundreds and sixty two girls and 282 boys aged 10-15 were recruited from 1995 to 1999. Bone measurements were made at one year intervals over 5 years by ultrasound densitometer (Achilles A1000) at the calcaneus together with questionnaires about menstrual status, physical activity, diet and other lifestyle factors from childhood to the

present.

Each bone data compared with the mean value of the same age was returned to the students in their class of health education. The students also had learned about what osteoporosis was including the risk factors and the importance of the prevention from very young.

Peak bone mass should be accumulated by the age of 15 years old in girls and older in boys by longitudinal observation, which was one to two years later than height spurt. Their bone minerals were associated with body weight, height, body mass index (kg/m^2), intake of dairy products in girls and boys, age at menarche and Japanese life-style living on Tatami mat in girls. Yearly increase in bone mass was associated with their increase in vegetable and fish in both girls and boys and with Japanese life-style and increase in physical activity in girls. The fracture rates of girls in Japanese life-style was significantly lower than girls in westernized life-style on sofa and chair. The yearly increase in boys was associated with their consciousness of previous levels of bone mass measurement.

These data suggested that the age 10 to 15 years be critical age especially in girls to accumulate the higher peak bone mass which enable to prevent osteoporosis in the later of their lives. Thus bone measurement and the education of bone health in pubertal age could help to improve their diet and physical activity and to induce their level of peak bone mass fully elevated.

要 旨

思春期生徒の骨量の経年変化から、最大骨量に達する年齢を明確にし、また、学校での骨量測定や保健教育が子供の骨量を上昇させることができるのかを検討した。

1995年から毎年1回5年にわたり、郡部に住む10～15歳の全員である、女子262名、男子286名の右足踵骨骨量を超音波法で測定し、運動、食生活等生活習慣をアンケートにより調査を行い、骨量測定結果返却時に骨粗鬆症予防のための保健教育を行った。

女子では15歳頃（初経発来2年後）、男子は16歳以降に最大骨量に達するものと考えられる。初測定骨量との相関は男女とも体格、乳製品摂取、

女子に畳の生活様式が観察された。骨量の経年変化との相関因子は男女とも野菜、魚摂取の増加であり、女子の畳生活者はイス式の者より高い骨量上昇と低い骨折率が認められ、初経発来前の運動量の増加とも相関が観察された。男子では骨量値への関心、運動や食生活に変容のあった者に高い骨量増加が認められた。

以上のことより最大骨量獲得期における学校での骨量測定、骨量上昇のための保健教育は、より高い最大骨量の獲得を可能にし、骨粗鬆症予防に有効である可能性が示唆された。