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Association of lean and fat body mass, bone biomarkers and gonadal steroids with bone mass during pre-and midpuberty

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Aims: The association of bone mass with body composition, bone turnover markers and gonadal steroids was examined in Hungarian children during pre-and midpuberty.

Methods: Two hundred and thirty-seven, 7-16 year old subjects (56% girls) were investigated. Bone mineral density (BMD), fat mass and total and appendicular lean mass was estimated with dual-energy X-ray absorptiometry (Lunar Prodigy). The fat mass index and appendicular lean mass index (LMI) were calculated. Serum bone markers, parathyroid hormone, estradiol, and testosterone were analyzed. Associations between variables were evaluated by multiple regression analysis.

Results: During pre-puberty, bone biomarkers, gonadal steroids and appendicular LMI were associated with bone mass in both genders ($p < 0.05$). During midpuberty, girls' bone turnover markers were negatively associated with bone mass ($p < 0.001$). In pre-puberty, appendicular LMI and β -crosslaps were predictors of bone mass in both genders. During midpuberty, appendicular LMI and gonadal steroids positively contributed to bone mass in both genders, while osteocalcin exerted a negative influence on total and L1-L4 spine BMD in girls and on L1-L4 BMD in boys (all $p < 0.001$).

Conclusions: Predictors for bone development varied according to tanner stage and gender. The most significant determinants of bone mass were appendicular LMI and estradiol.

Biography

Violetta Csákváry is a Paediatrician, Neonatologist, Endocrinologist from Hungary. She has completed her PhD in the field of investigation of bone metabolism in healthy 6-18 years old children and Postdoctoral studies from Medical University of Pécs. She has had 57 presentations of endocrinology and has published 9 papers in reputed journals.

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