



Association of Obesity or Overweight with Bone Health in Childhood and Adolescence: Another Health Risk Never to Be Underestimated

Obesity and its related medical conditions in both children and adolescents are significant health problems. Numerous pediatric health conditions are related with excess adiposity, altered body composition, or endocrine disturbances that can affect bone accretion. The majority of clinical research evaluating the relationship between weight status and bone mineral density (BMD) have been performed in adult populations, which have shown a positive association of body mass index with total body BMD (1). However, the effects of obesity or overweight on bone health are less extensively studied in children and it is still controversial whether overweight or obesity during childhood is beneficial or harmful for the acquisition of bone mass (2,3). The relationship between adiposity and BMD in the pediatric population is not completely understood. But, since childhood and adolescence are critical stages for skeletal mineralization, it is important to understand how body composition during this period may influence bone mineralization and may affect bone health.

In this issue, Kim et al. (4) reported the role of overweight and obesity on bone Health in Korean Adolescents from the Korea National Health and Nutrition Examination Survey (KNHANES) from 2009 to 2010. They also investigated the independent effects of lean mass (LM) and fat mass (FM) on bone mass and density in male and female adolescents. What is noticeable from their report is that this was the first study that has been conducted among Korean adolescents. In addition, they found a beneficial effect of overweight or obesity as well as LM on bone mass and density in both sexes through multivariate regression model and gender- and skeletal site-specific differences in the effect of FM on bone health. This could be in line with a recent meta-analysis about the differences in BMD between normal-weight children and children with overweight or obesity which showed overweight and obese children have a significantly higher BMD compared with normal-weight children (5). Another pooled analysis reported on the current evidence on effects of LM and FM on bone mass and density among the children and adolescents indicated that the increase in bone parameters seen in overweight and obese children and adolescents is due to an increase in LM and not to greater FM (6). The other cross-section-

al survey of U.S. children and adolescents from the NHANES reported that both total body BMD and lumbar spine BMD decreased with increasing percent body fat and total FM in both genders and all races, suggesting regional differences in the relationship of adiposity to BMD in children and adolescents (7). Considering that LM has a direct mechanical impact on the bone, clinicians need to pay attention to the LM as a major contributor to enhance bone health in overweight or obese pediatric populations.

Finally, the study by Kim et al. (4) is limited by insufficient assessment of the different Tanner's pubertal staging and hormonal changes during the pubertal period, since information on those potential confounders affecting bone health seemed unavailable. Besides, given the results of the cross-sectional study design, which did not prove causality, this study was unable to provide more knowledge on the significance of childhood obesity or overweight on the quality and strength of the bones. As this retrospective clinical study cannot directly evaluate mechanisms for the findings in the current study, still more data from studies with a prospective study design and a representative sample are needed to get further insight of potential long-term consequences and the development of bone mineral content and BMD in the Korean pediatric population, using both dual-energy X-ray absorptiometry (DXA) and quantitative computed tomography (QCT) methods.

DISCLOSURE

The author has no potential conflicts of interest to disclose.

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