

## Childhood obesity and bone metabolism: another problem to deal with

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Dear Editor,

the problem of childhood obesity is reaching a worrying epidemiological volume and the age of onset seems to be constantly anticipated. Therefore, these pediatric patients are often faced with complications typical of the adult. In a recent article by Wang JW et al. (1), the authors conclude that body composition is related to serum osteocalcin levels in overweight and obese children. We really appreciated their attempt to deal with a controversial and not yet clarified issue in an original way. However, we believe that their findings can be discussed in the light of recent evidence.

Sabhaney V et al. with a prospective cross-sectional study of 2213 children, conclude that obese children had a minor but statistically significant decreased odds of fracture relative to children with a normal BMI (2).

Kwan C. et al., through a retrospective analysis of 1340 patients, demonstrate that in children with extremity fractures, obese children were not at increased risk for extremity fractures or subsequent complications compared with non-obese children (3).

Furthermore, Chan MY et al. show that there is no significant direct effect of body mass index (BMI) on fracture, and that the observed association between BMI and fracture risk is mediated by femoral neck BMD in both men and women (4).

We believe it is useful to recall the inverse relationship between parathyroid hormone (PTH) and vitamin D in children obesity: serum 25(OH)D levels are lower in obese, likely due to sequestration of vitamin D in the adipose tissue, in association with a PTH increase. In overweight and obese children, the PTH axis is activated at much lower 25(OH)D levels than in normal eight children. These findings are a consequence of similar ionized calcium levels in these groups despite lower

serum 25(OH)D levels in obese children (5).

In conclusion, we emphasize that the correlation between BMI and risk of fracture appears to be extremely controversial. We first need to better define the real influence of nutritional status on bone metabolism and then defining the biochemical mechanisms of mutual influence. Certainly, the need for childhood obesity prevention campaigns is compelling.

### References

1. Wang JW, Tang QY, Ruan HJ, et al. Relationship Between Serum Osteocalcin Levels and Body Composition in Obese Children. *J Pediatr Gastroenterol Nutr.* 2013 Nov 16. [Epub ahead of print]
2. Sabhaney V, Boutis K, Yang G, et al. Bone Fractures in Children: Is There an Association with Obesity? *J Pediatr.* 2014 May 13. pii: S0022-3476(14)00334-5. doi: 10.1016/j.jpeds.2014.04.006. [Epub ahead of print]
3. Kwan C, Doan Q, Oliveria JPet al.. Do obese children experience more severe fractures than nonobese children? A cross-sectional study from a paediatric emergency department. *Paediatr Child Health.* 2014 May;19(5):251-5.
4. Chan MY, Frost SA, Center JR, et al. Relationship Between Body Mass Index and Fracture Risk Is Mediated By Bone Mineral Density. *J Bone Miner Res.* 2014 May 24. doi: 10.1002/jbmr.2288. [Epub ahead of print]
5. Amini Z, Bryant S, Smith Cet al.. Is the serum vitamin D-parathyroid hormone relationship influenced by obesity in children? *Horm Res Paediatr.* 2013;80(4):252-6. doi: 10.1159/000354645. Epub 2013 Sep 25.

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