Bone density, body composition, and markers of bone remodeling in type 1 diabetic patients.

Abd El Dayem SM, El-Shehaby AM, Abd El Gafar A, Fawzy A, Salama H.

Department of Pediatrics, National Research Center, Cairo, Egypt.

Abstract

OBJECTIVE:
To assess bone mineral density (BMD), body composition by dual X-ray absorptiometry (DXA), and various biochemical markers of bone growth and resorption in a group of children with type 1 diabetes mellitus (T1DM).
PATIENTS AND METHODS:
The study included 47 patients with T1DM and 30 age- and sex-matched controls. Anthropometric measurements, biochemical markers for bone formation, bone resorption and DXA were done for all patients and controls.
RESULTS:
Of our diabetes patients, seven (16.7 %), three (7.3 %), and 17 (41.5%) met diagnostic criteria for osteopenia at the right femur, lumbar spine and total body, respectively. On the other hand, osteoporosis as defined by the WHO criteria was diagnosed in 21 patients (51.2%) at the total body by DXA. Lean body mass and lean fat ratio were lower, while, total fat mass, abdominal fat%, soft tissue fat mass%, and fat/lean ratio were higher in diabetics compared to controls. Also, our patients showed lower serum osteocalcin, osteoprotegerin, procollagen type 1, and higher urinary deoxypyridinoline. Pubertal (diabetics and controls) have higher BMD and BMC than prepubertal.
CONCLUSION:
Diabetic patients had a low BMD after adjustment (Z score), low bone formation and high bone resorption markers. Diabetes control and increase in BMI leads to a decrease in the incidence of low bone mineral density. Diabetes causes an increase in body fat especially abdominal fat which leads to an increase in insulin resistance and decrease in lean mass.

Published In: Scand J Clin Lab Invest. 2011 Sep;71(5):387-93. doi: 10.3109/00365513.2011.573574. Epub 2011 Apr 8.