Femoral geometric parameters and BMD measurements by DXA in adult patients with different types of osteogenesis imperfecta.

Source
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Abstract

OBJECTIVES:
Osteogenesis imperfecta (OI) is an inherited disorder characterized by increased bone fragility with recurrent fractures that leads to skeletal deformities in severe cases. Consequently, in most OI patients, the hip is the only reliable measuring site for estimating future fracture risk. The aim of the study was to assess the applicability of hip structure analysis (HSA) by DXA in adult patients with osteogenesis imperfecta.

MATERIALS AND METHODS:
We evaluated bone mineral density (BMD) and hip structure analysis (HSA) by DXA, including cross-sectional area (CSA), cross-sectional moment of inertia (CSMI) and femoral strength index (FSI) in 30 adult patients with different types of OI and 30 age-matched healthy controls (CO). The OI total group (OI-tot) was divided into two subgroups: the mild OI I group (OI-I) and the more severe OI III and IV group (OI-III-IV).

RESULTS:
The mean neck BMD of OI-I and OI-III-IV were significantly lower compared to CO (-15.9 %, p < 0.005 and -37.5 %, p < 0.001 respectively). Similar results were observed at trochanter and total hip. CSA and the CSMI value were significantly lower for OI-I (-23.2 %, p < 0.001) and OI-III-IV (-45.9 %, p < 0.001) in comparison to CO. In addition, significant differences were found between the mild OI-I and the severe OI-III-IV group (-29.6 %, p < 0.05). FSI was significantly decreased in the OI-III-IV (25.7 %, p < 0.05) in comparison to the CO. Furthermore, significant correlations between BMD and HSA and between HSA and height and weight were found in osteogenesis imperfecta and controls.

CONCLUSION:
BMD measurement in osteogenesis imperfecta patients is very critical. The combination of BMD and geometric structural measurements at the hip in osteogenesis imperfecta patients may represent an additional helpful means in estimating bone strength and fracture risk.