High whole-body bone mineral density in ossification of the posterior longitudinal ligament

Abstract

Objectives: Recent studies suggested that ossification of the posterior longitudinal ligament (OPLL) is exacerbated by systemic metabolic disturbances, including obesity. However, evidence on the relationship between OPLL and systemic bone metabolism is insufficient. We aimed to investigate whether patients with OPLL develop increased whole-body bone mineral density (BMD).

Methods: In this cross-sectional study, we analyzed whole-body BMD was in symptomatic OPLL patients (OPLL [+]; n = 99) and patients without spinal ligament ossification (OPLL [-]; n = 226) at a single institution in Japan from 2018 to 2022. Subjects were categorized based on sex, age (middle-aged [<70 years] and elderly [≥70 years]), and OPLL type (localized OPLL [OPLL only in the cervical spine] and diffuse OPLL [OPLL in regions including the thoracic spine]). We assessed an association of OPLL with whole-body BMD by multiple regression analysis.

Results: Compared with the OPLL (-) group, the OPLL (+) group of elderly women had significantly higher BMD in all body parts ($P < 0.01$), and the OPLL (+) group of elderly men had significantly higher BMD in all body parts except the ribs, forearm, and head ($P < 0.01$). The factors associated with increased BMD of both the femoral neck (load-bearing bone) and head (non-load-bearing bone) were age, body mass index (BMI), and diffuse OPLL in women and BMI and localized OPLL in men.

Conclusion: Patients with OPLL have increased whole-body BMD, suggesting that an imbalance in systemic bone metabolism rather than focal mechanical irritation could be related with the etiology of OPLL.