Abstract

Patients with ankylosing spondylitis (AS) have low BMD and high fracture risk. BMD, bone microarchitecture and strength determine bone fragility. This study aimed to analyze how AS affects bone microarchitecture and strength. Volumetric BMD (vBMD) and microarchitecture were measured using HRpQCT, and bone strength was estimated using finite element analysis. Multivariable linear regression was used to analyze the effect of AS on HRpQCT and FEA parameters. In multivariable linear regression models, AS patients (n=44) had lower volumetric BMD, cortical thickness, BV/TV and higher cortical porosity and trabecular separation when compared to non-AS subjects (n=85). FEA parameters such as bone stiffness and stress were also abnormal in AS patients. To conclude, it was found that volumetric BMD, trabecular and cortical microarchitecture as well as FEA parameters were worse in AS patients than non-AS subjects. These abnormalities might partly explain the high fracture risk in patients with AS.