BONE EROSIONS AND OSTEOPHYTES IN PREMENOPAUSAL WOMEN WITH LONG-STANDING RHEUMATOID ARTHRITIS: ASSOCIATION WITH SYSTEMIC BONE INVOLVEMENT USING HR-PQCT

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BACKGROUND

Two patterns of bone involvement are described in systemic and localized rheumatoid arthritis (RA). Systemic bone involvement is characterized by loss of generalized bone mass, osteoporosis and risk of fractures, and the localized by periarticular osteopenia, cysts and bone erosions. High-resolution peripheral quantitative computed tomography (HR-pQCT) is an imaging methodology capable of assessing volumetric bone mineral density (vBMD) and bone microarchitecture at the distal tibia and radius, as periarticular bone lesion, catabolic (erosion) and anabolic (osteophytes) in arthropathies inflammatory. To evaluate premenopausal women with long-standing RA and to explore the relationship between parameters of systemic and localized bone involvement.

METHODS

Eighty consecutive RA premenopausal women were evaluated. Volumetric bone mineral density, microarchitecture and finite element analysis were performed using HR-pQCT at the distal radius and tibia and compared with parameters from 160 female healthy controls matched by age and body mass index. Localized bone involvement was also analyzed using HR-pQCT in the metacarpophalangeal and proximal interphalangeal joints to identify erosions and osteophytes.

RESULTS

The mean age of RA patients was 39.4 ± 6.7 years and disease duration 9.8 ± 5.3 years. Rheumatoid arthritis patients had impaired trabecular, cortical and bone strength parameters, at the distal radius and tibia, compared with healthy controls ($p < 0.05$). Bone erosions and osteophytes were found in 75% and 41.3% of patients, respectively. Comparing patients with and without erosions, at the distal radius and tibia, a lower cortical vBMD (radius: 980 ± 72 versus 1021 ± 47 mgHA/cm³, $p = 0.03$; tibia: 979 ± 47 versus 1003 ± 34 mgHA/cm³, $p = 0.04$) and higher cortical porosity (radius: 2.8 ± 2.5 versus $1.8 \pm 1.6\%$, $p = 0.04$; and tibia: 3.7 ± 1.6 versus $2.7 \pm 1.6\%$, $p = 0.01$) were observed in patients with erosions. At the distal radius, osteophyte volume was positively correlated with trabecular vBMD (0.392 , $p = 0.02$), trabecular number (0.381 , $p = 0.03$) and stiffness (0.411 , $p = 0.02$), and negatively with trabecular separation (-0.364 , $p = 0.04$).

CONCLUSION

This study showed that premenopausal women with long-standing RA had systemic bone fragility at peripheral sites. Moreover, erosions were associated mainly with cortical bone fragility at the distal radius and tibia, and osteophytes correlated with repair of trabecular bone at the radius.

KEYWORDS

Rheumatoid arthritis, Bone involvement, HR-pQCT, Erosion, Osteophyte.