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## Researches Classified – Oswaldo Cruz Awards – Clinical

# Bone impairment assessed by lumbar spine trabecular bone score (TBS) and HR-pQCT in male ankylosing spondylitis patients

*Academic Author:* **Pedro Luis Furlam**

*Academic Advisors:* **Valéria de Falco Caparbo, Carla Gonçalves Schahin Saad, Rosa Maria Rodrigues Pereira**

Faculdade de Medicina da Universidade de São Paulo - FMUSP

**Objectives.** Low bone mineral density (BMD) and osteoporosis diagnosis in AS patients is based on data using dual-energy X-ray absorptiometry (DXA), which may be difficult to interpret due to the presence of syndesmophytes. The objective of this study is to evaluate bone mass and quality using areal (a) BMD, lumbar spine trabecular bone score (TBS) and HR-pQCT parameters in AS patients compared with healthy controls (HC).

**Methods.** TBS and aBMD were evaluated using DXA. Volumetric bone mineral density (vBMD), bone microarchitecture and stiffness were analyzed at the distal tibia and radius using HR-pQCT. Seventy-three AS male patients and 52 age-matched HC were evaluated.

**Results.** Lower TBS values were observed in AS patients compared with HC ($1.314 \pm 0.121$ vs. $1.396 \pm 0.070$, p<0.001); however, no difference was observed in lumbar spine aBMD between these two groups ($1.080 \pm 0.193$ vs. $1.041 \pm 0.118$ g/cm2 , p=0.11). Lower trabecular vBMD ($162.1 \pm 39.6$ vs. $186.8 \pm 39.9$ mg HA/cm3 , p<0.001), lower structural parameters Tb.Th ($0.074 \pm 0.012$ vs. $0.080 \pm 0.013$ mm, p=0,044) and Tb.Sp ($0.497 \pm 0.110$ vs. $0.448 \pm 0.086$ mm, p=0,039) and lower strength parameters stiffness ($254250.8 \pm 48477.7$ vs. $291770.3 \pm 52858.4$ N/mm, p<0.001) and F.Load ($12098.6 \pm 2240.$ vs $13770.2 \pm 2388.1$ N, p=0,001) were observed in the trabecular compartment at the distal tibia in AS patients compared to HC.

**Conclusion.** The lumbar spine TBS and HR-pQCT imaging measurements are superior technologies to detect impairment of bone mass and quality in AS patients compared to healthy subjects.

**Key words:** Ankylosing spondylitis; Trabecular bone score; HR-pQCT; DXA; Bone density.