ABSTRACT COMPETITION WINNER 2016

Autoantibodies to osteoprotegerin are associated with low hip bone mineral density and history of fractures in axial spondyloarthritis

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Background: Osteoporosis and vertebral fractures are recognized complications of axial spondyloarthritis (axSpA) but the underlying causes are incompletely understood. Osteoprotegerin (OPG) inhibits bone resorption by acting as a decoy receptor for RANK-ligand. Previous studies have demonstrated that antibodies to OPG (OPG-Ab) may be associated with increased bone turnover.

Aims: To investigate the prevalence of OPG-Ab in axSpA and whether they were associated with markers of bone health.

Methods: Patients with axSpA were recruited from routine outpatient clinics at two centres in the UK between 2011-2015. Patient demographics and disease characteristics as well as history of fracture were recorded. Bone mineral density (BMD) was assessed using anteroposterior dual-energy X-ray absorptiometry (AP-DXA). OPG-Ab was measured for each patient in triplicate using an in-house ELISA. Positivity was defined as three standard deviations above the mean of healthy controls. Associations between OPG-Ab positivity and history of fractures were assessed using logistic regression adjusted for gender, years since diagnosis, BASDAI and body mass index. Association between OPG-Ab titre (log-transformed) and BMD was assessed by multi-adjusted linear regression.

Results: We studied 134 patients of whom 75% were male. The mean age was 47 (SD±15) years and median duration since diagnosis 6.4 years. Eleven (8.2%) patients tested positive for OPG-Ab. Positive OPG-Ab was independently associated with hip osteopenia/osteoporosis and history of fractures (Table 1). Log-transformed OPG-Ab titre was associated with hip BMD g/cm2 (ß=-1.84; 95%CI -3.01, -0.67). No association was seen with spinal BMD.

Table 1. Multivariable logistic regression models demonstrating associations between OPG-Ab positivity and measures of bone mineral density and history of fractures (adjusted for BASDAI, gender, disease duration and BMI).

	Odds ratio	95% CI
Hip osteopenia (T-score <-1) *	34.3	(3.24, 363)
Hip osteoporosis (T-score ≤-2.5) *	17.6	(1.06, 293)
History of previous fracture**	12.6	(2.29, 69.4)

*sample size with complete data for all covariates was 116.

**sample size with complete data for all covariates was 128.

Conclusions: OPG-Ab was positive in 8.4% of patients with established axSpA. Presence of OPG-Ab was independently associated with hip BMD and history of fractures. This raises the possibility that OPG-Abs can play a role in the pathogenesis of osteoporosis and may be a biomarker for accelerated bone loss in axSpA.