PECULIARITIES OF THE DEVELOPMENT OF LOW-ENERGY FRACTURES IN THE LUMBAR SPINE IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Relevance:

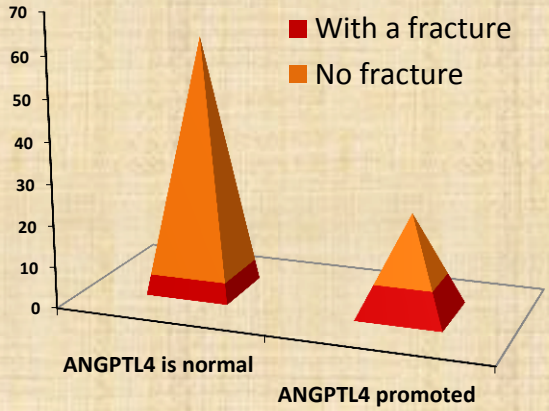
Osteoporosis (OP) is a frequent concomitant pathological condition in rheumatoid arthritis (RA) characterized by low bone mass and disruption of bone microarchitectonics. It leads to an increased risk of spontaneous fractures resulting from minimal or even no trauma. Due to the early detection of an increased risk of osteoporotic fractures (according to instrumental and laboratory research methods), it is possible to timely prescribe drug therapy and correct the lifestyle of patients with RA.

Purpose of the study: *to evaluate patterns of new low-energy fractures in the lumbar spine in patients with rheumatoid arthritis.*

Materials and Methods. 86 RA patients took part in the study. An enzyme-linked immunosorbent assay (ELISA) was used to determine serum angiopoietin-like protein type 4 (ANGPTL4).
The bone mineral density (BMD) of the lumbar vertebrae at the level of L1-L4, femoral neck, and femur in general was measured by dual-energy X-ray absorptiometry (DXA) on a Lunar Prodigy (GE, USA). All patients underwent DXA at the admission for treatment and after 24 months of observation. Each patient's BMD was compared with the average BMD of healthy young adults of the same sex. The default diagnostic threshold for OP was T-criterion: T points ≥ -1 were considered normal bone density, T points between < -1 and > -2.5 as osteopenia, and T points ≤ -2.5 as OP.

Results and Discussion.

ANGPTL4 values in RA patients correlated with the Sharp's radiological change score (ρ=0.39), the number of low-energy fractures in the lumbar spine at baseline (ρ=0.32) and after 24 months of follow-up (ρ=0.51). There was a close association of ANGPTL4 with the BMD index at the L1-4 level (r=-0.37). A detailed evaluation of the potential importance of ANGPTL4 for the prevention and treatment of patients with spinal OP remains to be performed.



Picture 1. *The frequency of spinal fractures at the level of L1-4 in groups of RA patients with different levels of ANGPTL4*

15% of RA patients had lumbar spinal fractures prior to the start of the study (according to amnestic data). During the two years of follow-up, new vertebral fractures were reported in 16 (21.9%) patients without previous fractures and in 7 (53.8%) patients with a history of fractures (p = 0.036). When RA patients initially had high levels of ANGPTL4 (>6.8 ng/mL; >3SD from healthy individuals), osteoporotic fractures in the spine according to DEXA were observed in a higher percentage of subsequent cases (66.7% vs. 12.7%; p<0.001). The dependence of ANGPTL4 and reduction of BMD in the cancellous bone layer allow us to identify a group of RA patients with high ANGPTL4 content as a risk group specifically for spinal fractures, and to consider ANGPTL4 as a potential target for the treatment of osteoporotic disorders.

Conclusions. Apparently, in order to track systemic bone loss in RA even before the clinical debut of the disease, initial OP screening using DXA and calculation of the estimated 10-year risk of osteoporotic fractures by FRAX should be performed with special attention in RA patients with high serum ANGPTL4 values. RA patients with baseline lumbar spine fractures and high serum ANGPTL4 values are at high risk of low-energy fractures at follow-up.