The role of mTOR gene expression, apoptosis and inflammation in obese patients with knee osteoarthritis

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Background: Metabolic osteoarthritis (OA) has been identified in rheumatology as a specific phenotype due to the growing rates of obesity and other comorbidities, with meta-inflammation as the key factor in its pathogenesis. On the other hand, OA progression is associated with altered regulation of chondrocytes' metabolism, namely, with up-regulated expression of genes encoding m-TOR, apoptosis, cartilage degeneration and inflammation.

Objectives: To measure the expression levels of genes encoding m-TOR, apoptosis (caspase-3), cartilage destruction (cathepsin K), and inflammation (TNF-α) in patients with knee OA (KOA) and obesity.

Methods: 50 female patients (45–65 y.o.) with Kellgren-Lawrence stage II-III KOA and obesity (BMI >30 kg/m²) were randomised into 2 groups. Pts in Group 1 (n=25) were administered orlistat as a specific therapy for obesity for the period of 6 months, and lifestyle modifications including low caloric diet and physical exercises for 12 months. Pts in Group 2 were recommended to observe the diet and weight management. Summary of clinical data and laboratory parameters and their association with WOMAC scales were performed using non-parametric methods. Medians and Spearman correlation (r) were used for continuous measures, and Mann-Whitney test was applied to categorical variables. This study was approved by the local ethics committee.

Results: Median higher synovial calprotectin levels were associated with worse WOMACpain (671.5 vs 431.8 ng/mL, p<0.05) and function (713.4 vs 400.1 ng/mL, p<0.05) scores than patients with inferior levels. Patients with moderate to severe synovial effusion (≥8 mm on midline suprapatellar line) had higher calprotectin levels compared with those with mild effusion (≥261.4 vs 471.5 ng/mL, p<0.05). Synovial calprotectin levels showed moderate correlations with intraarticular TNF-α levels (r=0.26), hs-CRP (r=0.27) and a high correlation with synovial IL-6 levels (r=0.53).

Conclusions: Calprotectin showed association with inflammatory features as measured by ultrasound and inflammatory markers such as hs-CRP, TNF-α and IL-6, and was related to pain and function in patients with knee osteoarthritis with inflammatory features. Calprotectin appears to be a useful marker of inflammation and could be a useful marker for assessing response to treatments targeting inflammation.

Disclosure of Interest: None declared

Abstract 1. Gene expression in obese pts with knee OA