INTERRELATIONSHIP OF INFLAMMATION AND REMODELLING-RELATED FACTORS IN OSTEOARTHRITIS

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Objectives. Osteoarthritis (OA) is the most prevalent form of arthritis characterized by the damage of articular cartilage, extracellular matrix remodeling, as well as various degrees of inflammation. We aimed to analyze the expression of inflammation and remodeling-related factors in the synovial membrane of patients with OA.

Materials and Methods. Twenty OA surgery synovial tissue specimens were used in the study. The sections were stained with hematoxylin and eosin, and the histopathology in the synovial membrane was analyzed according to Krenn *et al.* grading system. Additionally, the expression of NF-kBp65, TNF-α and MMP-9 were assessed. The Jamovi 2.3.19. program was used for statistical data analysis.

Results. The severity of synovial inflammation was evaluated as 4 (IQR 3–6), consistent with low-moderate grade synovitis. The hyperplasia of the lining layer was not prominent. The cellular density and infiltration of inflammatory cells as well as angiogenesis in the sublining layer were low to moderate. The statistically significant difference in the expression of NF-kBp65 was established when low-grade (15.9 ± 16.5) and high-grade (58.2 ± 35.6) synovitis groups were compared comprizing 42.2, 95% CI [22.6–61.9], $t(25.4) = 4.43$, $p < 0.001$, $d = 1.52$. Similarly, the statistically significant difference in MMP-9 expression was established when the same groups were compared – low-grade (median = 5, IQR 4-8) and high-grade (median = 18,5, IQR 14–25,75) synovitis groups, $U = 30$, $p < 0.01$, $r = 0.744$. Moreover, the positive correlations between NF-kBp65 and MMP-9 and TNF-α and MMP-9 expression within synovial tissue were established ($p < 0.001$).

Conclusions. The study results suggest OA commonly is characterized by low-grade inflammation. The severity of inflammation in the synovial membrane is linked to other processes of the entire joint. The expression of inflammatory factors reveals a positive correlation with the expression of tissue remodeling-related factors, and further contributes to the progression of OA.