

## **Diagnostic value of matrix metalloproteinases-1, -3 and -13 in patients with primary knee osteoarthritis: relation to radiological severity, 2023**

### **Abstract**

*Background:* Knee osteoarthritis (KOA) is an important cause of disability in elderly. *Aim of the work:* to study the expression of matrix metalloproteinases (MMP-1, MMP-3 and MMP-13) in serum of patients with KOA and relation to radiological findings. *Patients and methods:* One hundred patients with KOA and 80 matching control were studied. The Kellegren Lawrence (KL) scale was assessed. The mRNA and protein expressions of MMP-1, MMP-3 and MMP-13 were assessed by "quantitative real-time polymerase chain reaction (qRT-PCR)" and western blotting, respectively. *Results:* There was a significant increase in the mRNA expression of MMP-1, MMP-3 and MMP-13 in patients ( $18.5 \pm 3.4$ ,  $3 \pm 0.5$  and  $2 \pm 0.2$ , respectively) compared to controls ( $2.6 \pm 0.4$ ,  $0.7 \pm 0.3$  and  $0.3 \pm 0.06$ , respectively) (all  $p < 0.001$ ) and in the protein expression of MMP-1, MMP-3 and MMP-13 in patients ( $2.89 \pm 0.01$ ,  $2.37 \pm 0.07$ ,  $2.56 \pm 0.02$ , respectively) relative to controls ( $1.15 \pm 0.04$ ,  $0.79 \pm 0.01$ ,  $1.02 \pm 0.08$  respectively (all  $p < 0.001$ ). A significant correlation was found between the age of patients and mRNA expression of MMP-1 ( $r=0.19$ ,  $p=0.01$ ) and MMP-3 ( $r=0.17$ ,  $p=0.019$ ) and between the BMI and mRNA expression of MMP-1 ( $r=0.16$ ,  $p=0.028$ ). No significant correlation was found between mRNA expression of MMP-1, MMP-3 and MMP-13 and grade of KOA. At cut off values 5.5, 1.7 and 0.8, MMP-1, MMP-3 and MMP-13 could diagnose KOA at a sensitivity of 98%, 100% and 100% respectively with 100% specificity for all. *Conclusion:* The expression of MMP-1, MMP-3 and MMP-13 could be a valuable non-invasive marker for early diagnosis of primary KOA with no relation to radiological finding.