

ABSTRACT

The aim of this work was to investigate the contribution of matrix metalloproteinases (MMPs) to recurrent corneal melting. Twenty three melted corneas from seven patients were separated into three groups: a) patients with primary Sjögren's syndrome, b) those with rheumatoid arthritis and c) those with other corneal melting underlying pathologies. Eleven cadaverous corneas served as controls. The presence of MMP-1, -2, -3, -7, -8, -9, and -13 was detected using indirect enzyme immunohistochemistry. The active forms of MMP-2 and -9 and MMP-3 and -7 were examined by gelatin and casein zymography, respectively. The concentrations of active MMP-1 and -3 were measured using activity assays. Increased immunostaining intensity for MMP-1, -2, -3, -7, -8 and -9 was shown in the corneal epithelium and the stroma of almost all melted corneas from all three groups compared to the negative or slightly positive staining of the controls. In the endothelium, immunostaining for MMP-2 and MMP-9 was increased in most specimens of groups II and III and group I, respectively. A markedly higher level of active MMP-2 was detected in six, and active MMP-9 in all, pathologic specimens compared to the controls. In contrast to the completely negative controls, the proenzymes of MMP-3 and -7 were detected in almost all melted corneas from all three groups. Active MMP-3 and -7 was found in each specimen from group I. Significantly increased concentrations of active MMP-1 and -3 were also found in the melted corneas. The increased expression and activity of a wide range of MMPs in melted cornea samples suggest that although different stimuli may trigger the pathways leading to the destruction of the cornea, these enzymes could partake mainly in the operational stage of this process, in which the massive degradation of the extracellular matrix takes place.