



Role of Matrix Metalloproteinase -9 in corneal injuries

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Introduction

- About 10 million people around the world suffer from corneal blindness
- Corneal injury can cause irreversible changes in the structure and morphology of the cornea and cause the development of fibrosis, which leads to changes in vision and disability
- Matrix metalloproteinase-9 (MMP-9) plays a vital role at all stages of wound healing
- MMP-9 has the ability to destroy components of extracellular matrix and synthesize collagen and it may lead to corneal wound restructuring
- Increased MMP-9 level leads to excessive degradation of extracellular matrix, which causes tissue destruction and loss of the eye visual function

METHODOLOGY

We examined 22 patients (22 eyes) with corneal injury (visiometry, biomicroscopy, corneal staining with fluorescein, fundus examination) aged between 24 and 65 years (average age 46.2 ± 2.2).

The control group consisted of 15 patients with no history of eye disorders

We used zymography in polyacrylamide gel to determine the active and latent forms of gelatinases MMP-9 in patient's tears

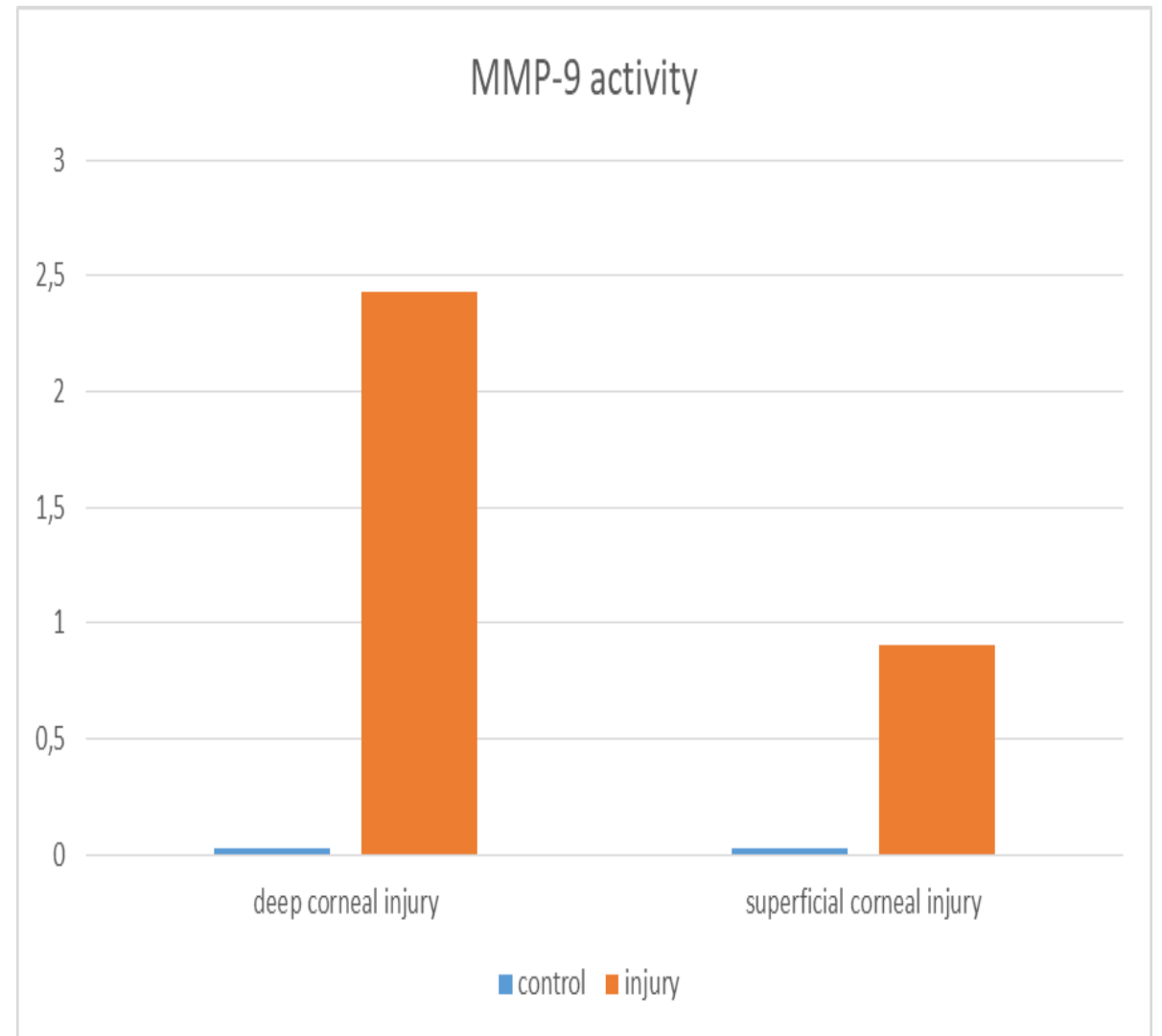
Results

We have found that:

- the MMP-9 level was 0.902863 ± 0.09869 ($p \leq 0.01$) conventional units in those cases when corneal damage was superficial
- the MMP-9 level was 2.5 times higher (2.4346 ± 0.1252 ($p < 0.01$) conventional units) in those cases when corneal damage was deep
- Gelatin zymography revealed increased levels of MMP-9 in the tears of patients with traumatic lesions of cornea (compared to the level 1.380686 ± 0.1308 ($p = 0.017$) conventional units found in the control group)

Results

- MMP-9 level was 0.902863 ± 0.09869 ($p \leq 0.01$) for superficial corneal damage
- MMP-9 level was 2.4346 ± 0.1252 ($p \leq 0.01$) for deep corneal damage
- Clinical signs of corneal injuries correlated with MMP-9 activity
- Sharp increases in the MMP-9 levels in patients' tears reflected the intensity of cornea inflammation and its epithelialization



Conclusions

The obtained results open the way for using MMP-9 in diagnostic and prognostic purposes for treating corneal injuries and monitoring the healing of corneal wounds

Use of MMP-9 inhibitors in treating corneal injuries can slow down the development of stromal ulcer and minimize corneal scarring