APOPTOSIS IN CORNEAL SPECIMEN FROM PATIENTS WITH HSV-1 STROMAL KERATITIS

S. Mrzyk, D. Bauer, G. Anastassiou, K.-P. Steuhl, A. Heiligenhaus

The pathogenesis of HSV-1 stromal keratitis is poorly understood. Keratocyte apoptosis has been found in response to experimental HSV-1 epithelial infection. Fas ligand (FasL)-induced apoptosis has been suggested as a mechanism to maintain immune privilege within the cornea. This study now investigated apoptotic cell death in keratectomy specimens from patients with HSV-1 stromal keratitis.

Methods The keratectomy specimens from patients with active HSV-1 nonulcerative (n=5) or ulcerative (n=10) necrotizing stromal keratitis were studied. Paraffin sections were analyzed histologically and by ,immunoperoxidase technique for the presence of HSV-1 antigens, Fas (CD95) and Fas ligand (FasL). The TUNEL-assay (TdT-mediated dUTP nick- end labeling) was used to detect apoptosis.

Results All samples with ulcerative keratitis showed an inflammatory cell infiltration in the epithelium and underlying stroma; HSV-1 antigens were noted in these areas. Apoptosis of infiltrating inflammatory cells was found. Numerous epithelial cells and keratocytes surrounding the ulceration were apoptotic. FasL-expression was observed on epithelial and endothelial cells outside the inflamed portion, but it had disappeared at the area of ulceration. Fas-expression was prominent in the epithelial cells and the keratocytes surrounding the ulceration. A significant number of cells within the inflammatory infiltrations were Fas+, FasL+, and TUNEL+. In the specimens with nonulcerative keratitis HSV-1 antigens, Fas expression, and apoptotic cells were located at areas of stromal inflammatory cell infiltration.

Conclusions Fas-system and apoptosis were identified in human HSV-1 stromal keratitis. The distribution of apoptosis differed between ulcerating and nonulcerating cases and correlated with HSV-1 antigen localization. The Fas- FasL system may modulate corneal tissue organization and the inflammatory response, and could play a role in maintaining corneal transparency in HSV-1 stromal keratitis.

DFG He 1877/7-1

Dept. of Ophthalmology, University, Hufelandstr. 55, 45122 Essen