What Is New in Ophthalmic Research – Focus on Ocular Surface Inflammation

Chitosan: A New Option to Accelerate Wound Healing in Alkali-Burned Corneas

Du et al., Jinan, China

Ophthalmic Res 2008;40:282–290

Corneal wound healing following alkali burns is a long-term process with various complications such as neovascularization, opacification, melting and even perforation. Resurfacing of the burned cornea by regular and intact epithelium in the early phase and subsequent moderate proliferation of corneal stromal cells play an important role in the course of wound healing. The surface-modified chitosan scaffold (PDLLA/chitosan) promoted epithelial wound healing in the acute phase of corneal alkali burns. It induced ordered collagen arrangement and is expected to offer a possibility to regenerate the ocular surface effectively with less scar tissue formation. Our result suggests that PDLLA/chitosan may be an interesting option to accelerate wound healing in corneal alkali burns.

High Frequency Ultrasound: A New Option to Evaluate Ocular Surface Toxicity

Denoyer et al., Tours, France

Ophthalmic Res 2008;40:298–308

Benzalkonium chloride is the most commonly used preservative in antiglaucoma drugs despite its cytotoxic properties at the ocular surface. We developed a new very high frequency (VHF) ultrasound device for corneal epithelial evaluation and tested it for in vivo quantification of corneal damage in rabbit eyes. Following exposure to a preserved antiglaucoma solution, we found an early epithelial thinning in eyes, starting 21 days before the first clinical findings of toxicity. VHF ultrasound measurements correlated well with the histological analysis and damage assessed by scanning electron microscopy. Therefore early corneal changes preceding ocular surface toxicity can be detected by VHF ultrasound and indicate early toxic damage. This may have an important impact in clinical trials for ocular surface evaluation with a better reliability than standard examination.

Inflammatory Markers in the Tears of Patients with Ocular Surface Disease

Acera et al., Leioa, Spain

Ophthalmic Res 2008;40:315–321

The aim of this study was to determine the concentration of IL-1 β , IL-6 and pro-MMP-9 in the tears of patients with different ocular surface diseases and to analyze the possible relationship between the disorder and molecular inflammation. A total of 77 patients presenting with blepharitis, allergic eye disease, hyposecretive dry eye or conjunctivochalasis, and 18 normal subjects were enrolled. Increased IL-6 levels were found to be associated with blepharitis, whereas elevated IL-6 and IL-1 β were characteristic of conjunctivochalasis. Pro-MMP-9 levels were significantly elevated in all disorders, as compared to controls. These findings illustrate the selective implication of different molecules in each type of inflammation, bringing us closer to the biochemical changes of ocular surface disorders. Despite its difficulties and limitations, the tear analysis is an important tool for our understanding of these frequent pathologies.

Corneal Preservation Lowers the Risk of Donor-to-Host HSV Contamination

Robert et al., Limoges, France

Ophthalmic Res 2008;40:329–332

The main features of herpes simplex virus (HSV) keratitis involve the reactivation of a virus remaining latent in the patient's trigeminal ganglion. However, recent investigations using sequencing methods have highlighted HSV keratitis as a transmissible disease from donor to host in keratoplasty. This new consideration implies the possibility of HSV intracorneal latency, and the concept of HSV keratitis as a transmissible disease even in adults. Since the discovery of new infectious diseases in the 80s and 90s such as AIDS, prions or SARS, viral security of grafting has become a major concern, especially in eye banks. In this study, we show that HSV-infected murine corneas express less viral DNA, and less pathogenic virus, after preservation in standard eye bank conditions. The results of this work suggest that improvements in preservation methods are about to play a major role in preventing viral transmission through corneal grafts in the near future.

Uwe Pleyer, Editor-in-Chief