



Topical Insulin Effect on Corneal Healing in Different Ocular Surface Lesions

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The protective, healthy, continuously regenerating, non-keratinized stratified squamous corneal surface epithelium plays a crucial role in corneal protection and optical functionality, highlighting its importance in ophthalmology.

Ocular surface lesions represent a broad spectrum of disorders that significantly challenge patients and ophthalmologists. These circumstances can lead to visual impairment, up to blindness.

As such, digging into new lines of treatment to improve the patient's quality of life is necessary.

Insulin, a peptide hormone primarily known for its role in glucose blood level control and metabolism, is usually used as a diabetic treatment through subcutaneous injection. In addition, topical insulin treatment enhances the healing of superficial skin wounds and decubitus ulcers.

Identifying insulin in tears and the expression of insulin receptors on the ocular surface and in the lacrimal gland was a key factor in renewing ophthalmologists' worldwide interest in topical insulin medication. This encouraged them to explore the potential therapeutic effect of topical insulin drops in ophthalmology.

The cornea receives its sensory nerve supply from the fifth cranial nerve, "ophthalmic division," and the loss of this sensory innervation disturbs the corneal cells' metabolism and epithelial layers' regeneration, resulting in neurotrophic keratopathy (NK) in the form of corneal persistent epithelial defect, ulceration, and perforation. NK most commonly results from variant causes, including diabetes mellitus, herpetic keratitis, trauma, and central nervous system insults, which compromise corneal protective factors.

Multiple studies investigated the potential role of topical insulin treatment in NK, including diabetic keratopathy. Moreover, other researchers explored the use of topical insulin in different conditions, such as severe dry eye, infectious keratitis, recurrent corneal erosion, chemical burn, bullous keratopathy, Steven Johnson syndrome, and immune-mediated conditions.

Topical insulin effect poses a promising treatment option not only for NK but also for patients with severe dry eye; it improves both symptoms and signs of the corneal condition. Additionally, insulin eyedrops exert significant improvement in the treated eye condition of infectious keratitis, recurrent corneal erosion, chemical burn, bullous keratopathy, and immune-mediated corneal conditions.

Therefore, further studies are highly recommended to pinpoint topical insulin treatment protocols, proper intake timing, and concentration. Topical insulin is a cheap, cost-effective, and easily prepared treatment.