Herpes Simplex Keratitis: Bilateral Effects

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Müller et al. studied corneal nerve morphology and endothelial cell density (ECD) in patients with and without unilateral herpes simplex keratitis (HSK). They demonstrated correlated reductions in corneal central ECD, subbasal nerve number and length, and sensation in both the affected and clinically unaffected contralateral eyes. They suggest a potential link between corneal innervation and endothelial cell homeostasis. Herpes simplex virus-1 (HSV-1) can be latent in the trigeminal ganglion and the cornea itself. The epithelial and endothelial cells and the keratocytes of the cornea are permissive to HSV-1, clinically evident by the different manifestations of HSK. In addition, HSV-1 strains in each eye may differ in terms of neurovirulence, resistance, and clinical manifestations. Shedding of HSV occurs in the tear film and saliva, and evidence of HSV-1 has been found in the cornea of apparently clinically unaffected corneas, but with much lower amounts and frequency than in patients with a history of clinical disease. It is plausible that viral reactivation occurred in both trigeminal ganglia and possibly the cornea, resulting in the presence of virus in both clinically affected and fellow eyes. The absence of clinically recognizable disease in fellow eyes would support the differences in nerve count, sensation, and ECD between affected and contralateral eyes. What is important about this study is the demonstration of the bilateral effects of HSK particularly in terms of ECD and corneal innervation. These bilateral effects of clinical unilateral HSK raise significant issues regarding treatment, prophylaxis, and management, particularly with regard to consideration of greater use of systemic antiviral therapy. Future work would be to longitudinally sample for HSV-1 and image the affected and unaffected areas of the cornea in the affected and fellow eyes, including other measurements of sensation in addition to mechanical touch such as temperature and chemical stimuli, which may be selectively altered in HSK.

References


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