Treatment of Steroid-Induced Recurrent Herpes Simplex Virus Epithelial Keratitis

Angela Chu, O.D.
Ocular Disease Resident
University of Houston College of Optometry

Abstract:
Steroid use is a considerable risk in recurring Herpes Simplex Virus (HSV) epithelial keratitis. This case demonstrates the efficacy of treatment with oral acyclovir followed by a maintenance dose to reduce the risk of recurrences.

I. Case History
a. 77yo Caucasian male
b. CC: Blurry vision at distance and near OS
d. Medical Hx: (+) Hypercholesterolemia, (+) Elevated triglycerides, (+) Hypertension, (+) Pneumonia
e. Medications: Advil, Centrum, fish oil, Fluticasone nasal spray, Symbicort, Triamterene, Vitamin C

II. Pertinent Findings
a. Entering acuities:
i. OD 20/20
ii. OS 20/50++, 20/25++ PH
b. Pupils: Equal, round, and reactive to direct and consensual stimulation. (-) APD OU.
c. Cornea OS: mild corneal haze centrally with dendrite (about 1 mm, 3 branches), (+) NaFl staining, (+) Rose Bengal staining
d. Anterior chamber OS: (-) cells or flare

III. Differential Diagnosis
a. HSV Epithelial Keratitis, Dendritic – Recurrent, steroid-induced
b. Bacterial Keratitis
c. Fungal Keratitis
d. Acanthamoeba Keratitis

IV. Diagnosis and Discussion
a. Herpes Simplex Virus (HSV) is a double-stranded DNA virus that is spread by skin-to-skin contact, or by direct contact with mucous membranes of an infected host. HSV is highly prevalent in the United States, having been found in about 100% of people over the age of 60 during autopsy. After the primary infection, the virus becomes quiescent but may reactivate in the trigeminal ganglion and spread to the eye via the ophthalmic branch of the trigeminal nerve. The most common risk factor for reactivation is a previous episode of an ocular HSV infection. Other considerable causes of reactivation are physical or emotional stress, UV rays, contact lens wear, surgery, and immunosuppression secondary to chronic steroid use. However, according to
the Herpetic Eye Disease Study (HEDS), there is no link between these risk factors and the reactivation of the virus.

b. HSV keratitis is one of the leading causes of corneal infection and blindness in the United States. HSV epithelial keratitis classically presents in a linear dendritic pattern that may or may not have associated geographic ulceration. The dendrites are areas of epithelial breakdown caused by viral proliferation. Fluorescein staining highlights these areas of cell destruction, and Rose Bengal staining reveals areas of intact, virally-infected epithelium.

V. Treatment and Management

a. The patient was prescribed oral acyclovir 400mg one tablet, five times daily for two weeks. The patient was then to taper to a maintenance dose of oral acyclovir 400mg one tablet twice a day for one year. The patient was also advised to consult with his physician about the possibility of discontinuing his inhaled steroid use. At his one week follow-up, the branches of the dendrites had become diffuse and flat, with no evidence of fluorescein or Rose Bengal staining. By the end of two weeks, the condition had resolved.

b. In immunocompetent patients, HSV epithelial keratitis is a self-limiting condition. However, initiating treatment during the early course of the disease hastens resolution and is critical for patients with a history of recurrence.

c. Studies have compared various treatment modalities for HSV epithelial keratitis. When comparing acyclovir 3% ointment five times a day to oral acyclovir 400mg five times a day, there was no statistical difference in healing rates. For treating active ocular HSV infections, oral acyclovir is advantageous in that it has better corneal stroma and anterior chamber bioavailability, and provides systemic antiviral activity.

d. Research has also shown that there is no statistical difference between topical acyclovir and trifluridine (Viroptic) in healing efficacy. However, topical acyclovir is less toxic to the cornea, resulting in fewer SPK.

e. The HEDS II study showed that a maintenance dose of acyclovir 400mg bid reduces the recurrence of any form of herpes by 41% in patients infected within the past year.

f. The HEDS II study also concluded that there was no benefit from the addition of oral acyclovir to topical trifluridine in preventing progression to stromal keratitis or iritis (progression itself is of low risk).

g. Ganciclovir ophthalmic gel, a more recently developed topical antiviral, has shown to be safe and effective in treating HSV keratitis, with minimal corneal toxicity. Research on the efficacy of ganciclovir has shown it to be as effective as acyclovir 3% ointment.

VI. Conclusion

a. Although research has not proven the link between the reactivation of ocular HSV infections and risk factors such as physical or emotional stress, steroid use, and CL wear, it is important to consider these factors in the management of patients with recurrent HSV keratitis. In this particular case, the patient was on multiple inhaled steroids, leading to an immunocompromised state, which may have potentiated an opportunistic infection.
b. Treating HSV epithelial keratitis with oral acyclovir alone is effective and avoids the corneal toxicity caused by antiviral ophthalmic solutions.

VII. References