Dissemination of Knowledge From Randomized Clinical Trials for Herpes Simplex Virus Keratitis

Herpes simplex virus type 1 (HSV), an enveloped virus with double-stranded DNA, is a major source of ocular infections. A 1982 study estimated that 400,000 people in the United States had ocular HSV infection, with 50,000 new and recurrent cases each year.1

Almost 20 years ago, the Herpetic Eye Disease Study Group was organized to elucidate the best treatments for HSV keratitis through the application of controlled, double-masked randomized clinical trials. The Herpetic Eye Disease Study trials demonstrated that topical corticosteroid with a prophylactic antiviral agent shortens the course of HSV stromal keratitis2 and that oral acyclovir prophylaxis significantly reduces recurrences.3 We surveyed eye care providers to examine the degree to which the best evidence-based practices (EBPs) in HSV keratitis have reached community care providers.

Methods. A 14-question survey (11 demographic and 3 clinical scenarios) was administered via postal mail or online to eye care providers with permission from their state and subspecialty societies. Questionnaires were distributed to 3 professional categories. Group 1 included optometrists in Arkansas and Texas (n=3820); group 2 were ophthalmologists without cornea fellowship training in Arkansas, Michigan, Oklahoma, and Texas (n=1345); and group 3 were ophthalmologists with cornea fellowship training who were contacted through the Ocular Microbiology and Immunology Group and the Cornea Society (n=1101). Clinicians were asked to identify EBPs for 3 conditions (HSV epithelial keratitis, HSV stromal keratitis, and recurrent HSV stromal keratitis) among 6 treatment options based on their awareness of published randomized clinical trials.4

Returned surveys were entered into a Microsoft Office Access 2003 database (Microsoft Corp, Redmond, Washington), and all respondent categories were merged and deidentified to create an analytic data set. Frequency statistics were computed and bivariate and logistic regression analyses were conducted using SAS version 9.1.2 statistical software (SAS Institute, Inc, Cary, North Carolina). The study was approved by the University of Oklahoma Health Sciences Center Institutional Review Board.

Results. Survey response rates were 6% for group 1, 15% for group 2, and 15% for group 3. Sensitivity analysis determined that respondents and nonrespondents had similar age and sex distributions, suggesting that respondents were representative of the study sample. In response to specific clinical scenarios, more than 95% of respondents from each group selected a topical or oral antiviral agent for treating HSV epithelial keratitis (Table). For HSV stromal keratitis, only 54% from group 1, as compared with 74% and 82% from groups 2 and 3, respectively, chose to combine a topical corticosteroid agent and an antiviral agent as treatment (P<.001). When prompted with a patient with repeated visually significant recurrences of HSV stromal keratitis, 51%, 60%, and 62% of groups 1, 2, and 3, respectively, chose to use an oral antiviral agent to prevent future episodes (P<.001).

Table. Percentage of Clinician Responses Identifying Correct Evidence-Based Practices in Each Scenario

<table>
<thead>
<tr>
<th>EBP</th>
<th>HSV Epithelial Keratitis, %</th>
<th>HSV Stromal Keratitis, %</th>
<th>Recurrent HSV Stromal Keratitis, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1</td>
<td>Group 2</td>
<td>Group 3</td>
</tr>
<tr>
<td>Observation</td>
<td>0.0</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Topical trifluridine</td>
<td>89.6</td>
<td>83.8</td>
<td>72.5</td>
</tr>
<tr>
<td>Oral acyclovir</td>
<td>5.6</td>
<td>13.7</td>
<td>23.2</td>
</tr>
<tr>
<td>Topical prednisolone</td>
<td>0.0</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Topical trifluridine and topical prednisolone</td>
<td>3.2</td>
<td>0.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Oral acyclovir and topical prednisolone</td>
<td>1.6</td>
<td>0.9</td>
<td>1.7</td>
</tr>
<tr>
<td>Total percentage with correct answers</td>
<td>95.2</td>
<td>97.5</td>
<td>95.7</td>
</tr>
</tbody>
</table>

Abbreviations: EBP, evidence-based practice; HSV, herpes simplex virus type 1.

*Group 1 indicates optometrists; group 2, ophthalmologists without cornea fellowship training; and group 3, ophthalmologists with cornea fellowship training. Correct answers are bolded.
Regression analyses showed that clinicians in group 2 were 2.23 (95% confidence interval, 1.34-3.70) times as likely to be aware of EBPs as those in group 1 in treating HSV stromal keratitis. Clinicians in group 3 were 2.92 (95% confidence interval, 1.70-5.01) and 2.27 (95% confidence interval, 1.29-3.98) times as likely to be aware of EBPs as their group 1 counterparts in treating HSV stromal keratitis and preventing recurrent HSV stromal keratitis, respectively. Adjusting for demographic and practice characteristics, training was the single most significant predictor of awareness of EBPs across these 3 common clinical scenarios.

Comment. A report by the Institute of Medicine concluded that many Americans are harmed by inappropriate use of health care services. McGlynn et al found that patients received only 54.9% of recommended care for medical conditions ranging from cataract (78.7%) to alcohol dependence (10.5%). Although the degree to which patients with HSV keratitis may be harmed by failure to follow EBPs is unclear, there appears to be considerable room for improvement in practitioners' knowledge of EBPs to manage HSV keratitis.

Scott M. Guess, MD
Amir L. Butt, MBBS, MPH
Stephen B. Neely
Robert C. Wild, MS, MPH
Ann F. Chou, PhD
James Chodosh, MD, MPH

Author Affiliations: Department of Ophthalmology, Dean McGee Eye Institute (Drs Guess and Chodosh) and Department of Family and Preventive Medicine (Dr Chou), College of Medicine, and Departments of Biostatistics and Epidemiology (Dr Butt and Messrs Neely and Wild) and Health Administration and Policy (Dr Chou), College of Public Health, Oklahoma Health Sciences Center, Oklahoma City. Dr Chodosh is now with the Department of Ophthalmology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston.

Correspondence: Dr Chodosh, Department of Ophthalmology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, 243 Charles St, Boston, MA 02114 (james_chodosh@meei.harvard.edu).

Financial Disclosure: None reported.

Funding/Sponsor: This work was supported by an unrestricted grant to the Department of Ophthalmology, University of Oklahoma Sciences Center from Research to Prevent Blindness.


Bow-Tie Cupping: A New Sign of Chiasmal Compression

The classic ophthalmoscopic1 and histologic2 pattern of band or bow-tie atrophy in retrograde degeneration of decussating axonal ganglion fibers is well recognized now. Herein, we describe a further sign of chiasmal compression, which may be called bow-tie cupping or horizontal band cupping.

Report of a Case. A 12-year-old boy with a longstanding suprasellar craniopharyngioma compressing the optic chiasm and right optic nerve was examined. Despite debulking surgery, radiotherapy, and repeated aspirations of the cystic component, his vision deteriorated further. The right eye showed no light perception and a right relative afferent pupillary defect. The left eye had a visual acuity of −0.16 logMAR (about 20/14) for distance and N4.5 for near. He correctly identified 16 of 17 Ishihara color plates. Goldmann kinetic perimetry of the left eye confirmed a dense temporal hemianopia.

On fundus examination, the left optic disc head showed segmental bow-tie atrophy nasally and temporally, accompanied by an abnormally high horizontal cup-disc ratio of 0.8 (vertical cup-disc ratio = 0.5) (Figure, A). The nasal rim was particularly thinned and showed complete loss of the nerve fiber layer. In contrast, the superior and inferior disc rim segments appeared comparably thick and pink with clearly visible superior and inferior nerve fiber layers and striations. Likewise, the right optic disc showed an increased horizontal cup-disc ratio of 0.8, although the vertical cup-disc ratio was also increased (0.65), giving rise to a more concentric cup compared with the horizontal oval cup of the left eye (Figure, B). As in the left eye, the right optic rim was thinnest nasally. His intraocular pressures have never been elevated on repeated measurements during more than 2 years, ranging between 13 and 17 mm Hg on Pulsair tonometry (Keeler Ltd, Windsor, England) and 10 mm Hg on Goldmann applanation tonometry in each eye.

Comment. In fewer than 10% of patients, compressive lesions of the anterior visual pathway result in nonglaucomatous pathologic cupping.3,5 This case illustrates bow-tie or horizontal band cupping with pathological nasal and temporal cupping in addition to band atrophy due to compression of the decussating nasal axonal fibers of the chiasm. As the temporal retinal ganglion fibers do not decussate into the chiasm, they are therefore relatively spared by chiasmal compression, accounting for the relative preservation of the vertical optic disc poles and nerve fiber layer segments and the preservation of the remaining left nasal visual hemifield.2,6 Compared with the purely horizontal cupping and segmental bow-tie atrophy seen in the left eye, the generalized optic disc pallor, the rounder cup, and the loss of all discernible nerve fiber striations in the right eye reflect the additional loss of the temporal ganglion fibers in the right eye as a result of right optic nerve degeneration.