CASE REPORT

Topical ayurvedic ointment-induced chemical injury presenting as bilateral acute keratitis

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SUMMARY

A 40-years-old female patient was referred to the cornea clinic as a probable case of bilateral keratitis. The patient had a history of headache followed by acute onset of redness, pain and discharge from both eyes for 15 days. The patient was diagnosed as bilateral keratitis by the first contact physician and was started on topical antibiotics, cycloplegics and lubricating eye-drops. At presentation, both eyes had visual acuity of perception of light, conjunctival congestion, limbal blanching, diffuse corneal oedema and epithelial defect. A detailed history revealed application of Vicks VapoRub [topical ayurvedic analgesic which contains (per 100 g of product) menthol (2.82 g), camphor (5.25 g) and eucalyptol (1.49 mL) and excipients include thymol (0.1 g), turpentine oil (5.57 mL), nutmeg oil (0.54 mL), cedar wood oil and petrolatum)] on the forehead and eyelids for headache several times over 2–3 days before the onset. The patient further confirmed the accidental application of the ointment in the eyes. A provisional diagnosis of acute chemical injury with Vicks VapoRub was made and treatment with topical antibiotic, cycloplegic, steroid, lubricant and vitamin C was started. On follow-up, both eyes showed gradual resolution of corneal oedema and epithelial defect. Visual acuity improved in the left eye to 6/60 with no change in right eye due to corneal haze.

BACKGROUND

Application of home-made remedies and ayurvedic medications is a common practice in low/middle-income countries like India. Accidental or deliberate application into the eyes can lead to bilateral chemical injury. Patients often hide this history while presenting to the primary care physician, leading to improper diagnosis and delay in treatment. Careful and comprehensive history in these cases can avoid such misdiagnosis and prevent the long-term complications of chemical injury. Thus, in patients presenting with bilateral acute-onset redness, pain, discharge along with epithelial defect and stromal haze, physicians must consider chemical injury as a differential diagnosis, especially in low/middle-income countries like India.

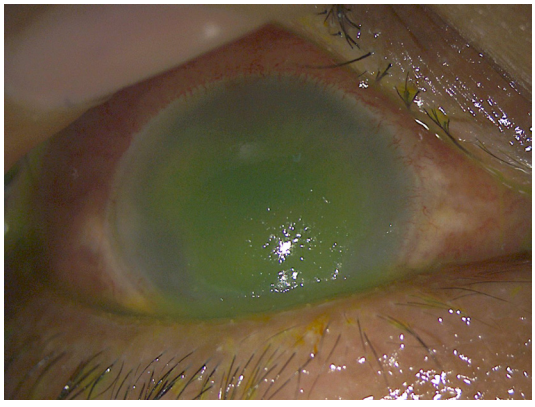

Figure 1 Slit lamp photograph of right eye showing 8×9 mm epithelial defect, diffuse corneal oedema with 270° limbal blanching.

CASE PRESENTATION

A 40-year-old female presented with chief complaints of diminution of vision, pain, redness, watering and photophobia in both eyes for 15 days. There was a history of application of Vicks VapoRub [which contains (per 100 g of product) menthol (2.82 g), camphor (5.25 g) and eucalyptol (1.49 mL), the excipients include thymol (0.1 g), turpentine oil (5.57 mL), nutmeg oil (0.54 mL), cedar wood oil and petrolatum] on the forehead and eyelids 15 days ago for headache and periorbital pain. Subsequent to this, she developed the above-mentioned symptoms in both eyes. She consulted a private general ophthalmologist immediately following the onset of these symptoms. The patient was diagnosed as a suspected case of bilateral infective keratitis and was started on topical and systemic antibiotics, topical lubricant and cycloplegic. Symptomatic improvement following this regimen was noted by the patient; however, subsequent follow-up revealed deterioration of the clinical condition in terms of epithelial defect and corneal oedema for which she was referred to a higher centre by the treating general ophthalmologist. The patient did not have a history of ocular trauma, contact lens use or similar episode in the past. The patient had undergone cataract surgery in both eyes 5 years ago with good gain of vision in both eyes.

At presentation, she had visual acuity of perception of light in both eyes. Lid oedema was present in both eyes. Intraocular pressure was 12 and 14 mm Hg in the right and left eyes, respectively, measured on the non-contact tonometer. On slit lamp examination, both eyes had conjunctival congestion, more than 270° limbal involvement, diffuse severe corneal oedema and epithelial defect measuring 8×9 mm and 6×7 mm in the right and left eyes, respectively, with no associated infiltrates (figure 1 and figure 2). The severity of chemical injury was Duas grade 5 in both eyes in view of more than nine clock hours of limbal involvement and more

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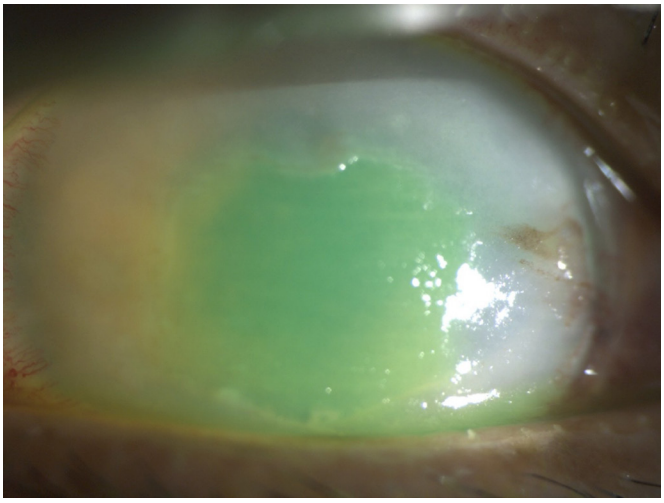

Figure 2 Slit lamp photograph of left eye showing 6×7 mm epithelial defect, diffuse corneal oedema and ground glass epithelial haze.

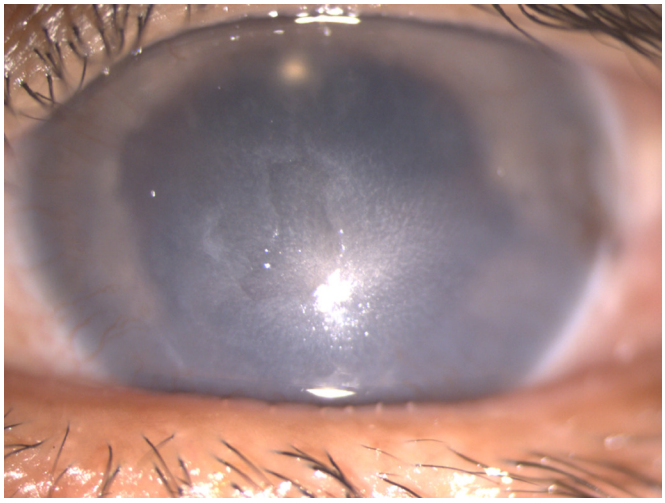

Figure 4 Slit lamp photograph of left eye at 1-month follow-up showing persistent epithelial defect with corneal haze.

than 75% of conjunctival involvement. The anterior chamber view was hazy; however, some fibrinous reaction could be seen through the peripheral cornea. The rest of anterior and posterior segment details could not be visualised.

INVESTIGATIONS

Corneal scraping was done using a Kimura spatula under topical anaesthesia. The sample was subjected to microscopic examination (Gram stain, potassium hydroxide wet mount and Giemsa stain) and culture and sensitivity testing (blood agar, Sabouraud's dextrose agar and non-nutrient agar with *Escherichia coli* overlay). Tear sample was assessed for Herpes simplex virus PCR. Confocal microscopy was also done to rule out *Acanthamoeba* cysts. Results of all these investigations were negative. Posterior segment was unremarkable in both eyes on B scan ultrasonography.

On systemic investigations, serological tests were negative for HIV-1 and HIV-2, hepatitis B surface antigen and hepatitis C virus. Complete blood count, erythrocyte sedimentation rate and C reactive protein were within normal limits.

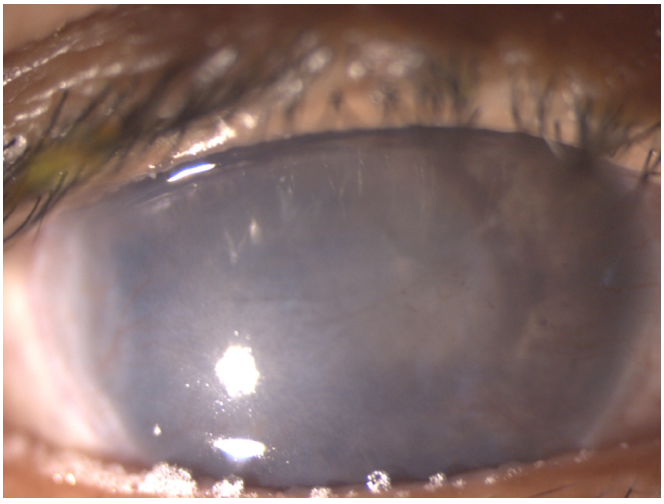

Figure 3 Slit lamp photograph of right eye at 1-month follow-up showing intact epithelium with diffuse corneal haze.

DIFFERENTIAL DIAGNOSIS

At presentation, the patient had a bilateral corneal epithelial defect, corneal oedema and anterior chamber reaction. In addition, she had severe pain in her eyes. Based on these findings and considering the case profile, a differential diagnosis of herpetic keratouveitis, acanthamoeba keratitis or chemical injury was made. However, microbiological investigations ruled out any infective pathology. Although the history was not straightforward initially, within a few days after admission a careful history could reveal accidental application of Vicks VapoRub into the eyes. This helped us to arrive at a final diagnosis of bilateral chemical injury.

TREATMENT

The patient was started on topical moxifloxacin hydrochloride 0.5% three times a day, homatropine hydrobromide 2% four times a day, prednisolone phosphate 1% six times a day, carboxymethyl cellulose 1% 2 hourly and tablet vitamin C 500 mg four times a day. Topical steroid was stopped after 10 days of therapy as it could have acted as a double-edged sword and hampered the healing process.

OUTCOME AND FOLLOW-UP

On day 5, the corneal oedema and epithelial defect started resolving in both eyes, visual acuity in the left eye improved to 6/60 (Snellen's chart), but did not improve in the right eye. Keratic precipitates, anterior chamber reaction of 2+ cells with a fibrinous membrane in anterior chamber of both eyes could be seen after improvement of the corneal clarity. The fundus was still not visible in the right eye due to persistent corneal haze while left eye revealed normal findings. At 1 month, the epithelial defect in right eye resolved completely with diffuse corneal haze (figure 3), while a persistent epithelial defect with diffuse corneal haze (figure 4) was noted in the left eye in which amniotic membrane graft was planned. However, the patient was unwilling to undergo any surgical intervention at that point in time, as the patient was feeling symptomatically much better compared with what the situation was at the time of presentation. Hence, the medical management was continued. The patient was explained regarding the probable future need for ocular surface stabilisation with limbal stem cell transplant and need for corneal transplant for visual rehabilitation.

DISCUSSION

We present a rare case of bilateral simultaneous acute chemical injury due to inadvertent application of Vicks VapoRub on eyelids while applying it on the forehead for pain relief. Though chemical injury with Vicks VapoRub is rare, it has been reported in literature by several authors.[1–3] Vicks VapoRub is an ointment which is used to relieve common cold symptoms such as nasal catarrh, a blocked nose, sore throat and coughs. The active ingredients are (per 100 g of product) menthol (2.82 g), camphor (5.25 g) and eucalyptol (1.49 mL). The excipients include thymol (0.1 g), turpentine oil (5.57 mL), nutmeg oil (0.54 mL), cedar wood oil and petrolatum. It is difficult to say which one of these is toxic to the eye. Brazda reported bilateral corneal abrasion in a patient following Vicks vapour 'blown' into his eyes under the influence of street drug ecstasy (3,4-methylenedioxymethamphetamine) to feel the mentholated sensation in the eyes.[1] Fung *et al* reported a case of severe combined chemical and thermal burn from microwave-heated Vicks VapoRub requiring amniotic membrane transplantation.[2] Jaiwal reported a case of bilateral dermo-kerato-conjunctivitis following application of Vicks VapoRub.[3] In our case, the patient inadvertently applied Vicks VapoRub for relief from headache and periorbital pain. Herpes simplex viral keratitis usually presents as a unilateral disease, but bilateral involvement can be seen in 1.3%–10.9% cases.[4] Most cases with bilateral keratitis have a predisposing factor like immune-compromised status or atopy but our case did not have any such predisposition.[5]

The importance of a careful history in such cases cannot be overemphasised. The particular patient in our case was not giving the history of Vicks VapoRub application initially. The primary reason being that the patient did not consider this to be relevant to her eye problem. Thus, to conclude chemical injury due to instillation of home-made remedies or non-allopathy medications must be considered as a differential diagnosis while dealing with cases of bilateral acute-onset keratitis in low/middle-income countries like India.

Learning points

- Local application of home-made remedies and ayurvedic medications is not rare in low/middle-income countries like India.
- Accidental or deliberate application of such agents can cause chemical injury to eyes presenting as redness, pain and discharge, which may be misdiagnosed as infectious keratitis.
- Thus, a poorly responding case of infectious keratitis must raise suspicion for an alternative diagnosis as seen in this case.
- Primary care physicians must be aware of such an entity.
- A high degree of suspicion and careful history often leads to an accurate diagnosis.

Contributors PS is responsible for admitting the patient and recording of all data and preparing the manuscript. GS is responsible for initial work-up and subsequent care of the patient while admitted into the ward. PKM is responsible for conceptualisation, literature search and proof reading and preparation of final draft. JST is responsible for looking after the overall treatment of the patient, decision-making and final draft preparation. PS and PKM are the guarantors.

Competing interests None declared.

Patient consent Obtained.

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