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Steroid associated infective keratitis

Case studies for caution

Keywords: eye diseases; steroids; keratitis; corneal ulcer

Case study 1

Betty, 78 years of age, presented to the emergency department with an acutely painful discharging left eye on the background of a complex ocular history. While living overseas she had developed left eye herpes keratitis for which she sought treatment from an ophthalmologist. She had initially been prescribed oral valacyclovir tablets and then ongoing topical corticosteroid eye drops (dexamethasone 0.1%) and acyclovir eye ointment four times daily.

On arrival in Australia, Betty consulted a general practitioner for continuation of her treatment. The GP provided her with ongoing prescriptions for dexamethasone eye drops but inadvertently omitted the acyclovir eye ointment. No ophthalmology follow up was organised. Betty continued the dexamethasone drops unmonitored for several months.

On examination in the emergency department, Betty had no perception of light in her left eye. She had significant periorbital oedema and conjunctival chemosis. There was a large corneal abscess involving almost the entire corneal surface (Figure 1). There was an area of corneal thinning nasally, with evidence of corneal perforation. The anterior chamber was flat and the iris plugged the corneal perforation. She was febrile at 38°C.

Betty was admitted to hospital for treatment of a perforated corneal abscess. She was treated with intravenous antibiotics (ceftriaxone 1 g/day) and hourly fortified antibiotic eye drops (cephalothin 5% and gentamicin 0.9%). Despite several days of treatment, the eye was nonsalvageable and required evisceration (removal of the cornea and intraocular contents). The wound was left open to allow drainage of residual infection.

She underwent fitting of an ocular prosthesis 5 months later.

Case study 2

Edna, a nursing home resident aged 82 years, was referred to our institution with a painful discharging red right eye. She had a history of previous retinal detachment in this eye approximately 50 years earlier. The eye had been comfortable until 2 weeks before her presentation, at which time it became red and painful. At this time the doctor at the nursing home prescribed topical dexamethasone eye drops four times daily.

On presentation to the eye clinic, Edna had a large corneal abscess with significant conjunctival infection (Figure 2). She required a corneal scrape, which involved debriding necrotic tissue at the base of the abscess. The scrape cultured



Figure 1. Large corneal abscess covering almost the entire corneal surface



Figure 2. Large corneal abscess with surrounding conjunctival infection

the bacteria *Pseudomonas aeruginosa*, an aggressive organism in corneal infections. Edna was admitted to hospital and treated with fortified topical antibiotic drops (ciprofloxacin 0.3% and gentamicin 0.9%) every hour, including overnight. Despite several days of intensive treatment the eye continued to deteriorate. Betty required evisceration of the eye and is currently awaiting fitting of an ocular prosthesis.

Discussion

These two cases demonstrate the importance of caution regarding the use of corticosteroid eye drops in the primary care setting. The inappropriate prescription of topical corticosteroids is likely to have contributed to the poor outcomes in both cases. Corticosteroid eye drops have an anti-inflammatory action and have important applications in ophthalmology, especially in the treatment of inflammatory eye disease. There are several commercially available brands of topical corticosteroid eye preparations available in Australia (Table 1).

Complications associated with topical ocular corticosteroids are well established and documented in the literature.^{1,2} Of particular concern is the risk of microbial keratitis, which can produce irreversible loss of vision. Ormerod³ demonstrated that topical corticosteroid use was a major risk factor for acquiring microbial keratitis among elderly patients (38%). Similarly, Van der Meulen et al⁴ found 28.6% of elderly patients admitted with infective keratitis had corticosteroid induced disease. The use of

topical steroid drops without antiviral cover in herpetic eye disease can lead to significant worsening of the condition.

It is hypothesised that corticosteroids delay corneal epithelial and stromal healing⁵ by increasing collagenolytic enzyme production and contribute to corneal thinning. Further, corticosteroids can lead to the development of cataracts,⁶ and this association holds true for topical ocular preparations occurring in a dose dependent fashion.^{2,7,8} In addition, corticosteroids are known to induce raised intraocular pressure in susceptible individuals⁹ which may lead to visual field loss and glaucomatous optic nerve atrophy.^{10,11} Side effects are summarised in Table 2.

General practitioners need to be aware that topical corticosteroid eye drops can have serious, potentially devastating side effects. It has been suggested that use of topical ocular corticosteroids in the primary care setting should only take place under appropriate specialist

guidance.^{12,13} Murtagh¹⁴ advises that 'as a general rule never use corticosteroids or atropine in the eye before referral to an ophthalmologist'. We agree that prior specialist review is necessary in order to rule out conditions that can significantly worsen as a result of steroid administration.¹⁵ By having a good working knowledge of the potential problems arising from this medication, GPs can work in conjunction with ophthalmologists to deliver safe and effective treatment for their patients.

A useful resource for GPs regarding eye assessment and primary care management is the New South Wales Eye Emergency Manual (see *Resource*). Another important issue for GPs to consider is how to decide which treatments to continue and which to stop. Using the example in *Case study 1*, specialist review before continuation of corticosteroid eye drops is a safe and prudent step.

Resource

The NSW Eye Emergency Manual: www.health.nsw.gov.au/resources/gmct/ophthalmology/eye_manual_pdf.asp.

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Conflict of interest: none declared.

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Table 2. Potential side effects of topical corticosteroid eye preparations

- Microbial keratitis – especially bacterial, herpetic, fungal
- Corneal thinning
- Delayed corneal healing
- Corneal perforation
- Cataract formation
- Raised intraocular pressure
- Glaucomatous optic neuropathy

Table 1. Corticosteroid eye preparations commonly available in Australia

Brand name	Generic name	Concentration	Relative strength	Form
Flarex™	Fluorometholone acetate	0.1%	Weaker	Eye drops
FML™	Fluorometholone	0.1%	Weaker	Eye drops
Hycor™	Hydrocortisone	0.5% or 1.0%	Medium	Eye ointment
Prednefrin forte™	Prednisolone acetate with phenylephrine hydrochloride	Prednisolone acetate 1% phenylephrine hydrochloride 0.12%	Stronger	Eye drops
Maxidex™	Dexamethasone	0.1%	Stronger	Eye drops

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