

## Steroids and the eye

### Key learning points

- Steroids are widely used in ophthalmology to suppress inflammation, reduce symptoms and minimise scarring.
- They are prescribed as drops, ointments, creams and rarely tablets, and are also injected into and around the eye, most recently as depot preparations. Injected depot intraocular steroids have been reported to have 63% incidence of adverse effects [1].
- This factsheet focuses on the side effects of steroid preparations and considers the role of the GP in prescribing steroid eye drops.
- Ocular side effects include cataract, raised intraocular pressure and suppression of the immune response make infection more likely and delay wound healing.
- Steroids are also known to trigger central serous chorio-retinopathy (CSCR) in susceptible individuals.
- Systemic side effects of locally administered steroids occur rarely.
- It is important that General Practitioners are aware of the potential for and hazards of steroid misuse and provide information for patients who request repeat prescription.

### Benefits of steroids in eye disease

Steroid treatment is invaluable in ophthalmology. Steroid drops are widely used in every subspecialty field to suppress inflammation and reduce scarring. Probably the most important indication for steroid eye drops is anterior uveitis, to minimise the inflammatory response within the eye and prevent its sequelae that may result in glaucoma, cataract and blindness. Because steroids have well recognised side effects they tend to be reserved for progressive conditions where alternatives are less effective.

- (i) Steroid Drops.
  - a. External eye disease – Used in allergic eye disease and severe blepharoconjunctivitis only when alternative and adjunctive medicines (mast cell inhibitors, anti-histamines, non-steroidal anti-inflammatories) have failed to control symptoms.
  - b. Anterior uveitis.
  - c. Post-operative intraocular surgery. Widespread use in most ophthalmic surgery. Now some evidence that non-steroidal anti-inflammatory drops may be equally effective.
  - d. Keratitis (combined with antiviral therapy in Herpetic eye disease, with antibiotic in bacterial ulcer).
- (ii) Steroid Creams (Hydrocortisone 0.5%, 1%) for periocular eczema.
- (iii) Steroid Ointments: Used for severe anterior uveitis overnight.
- (iv) Depot steroid injections into the eye for macular oedema secondary to retinal vein occlusion; diabetic retinopathy intolerant or resistant to anti-VEGF therapy.
- (v) Injections around the eye in posterior uveitis.
- (vi) Systemic steroids for temporal arteritis, scleritis, retinitis and posterior segment infections (combined with local and systemic anti-infective agents).

## Topical steroids and dependency

- Care has to be taken to reduce steroid eye drops gradually over time.
- If they are stopped abruptly, there may be rebound inflammation.

## Steroid eye drops and systemic effects

- (vii) Steroid eye drops may contain significant active ingredient. Systemic effects have long been recognised especially with chronic use or when body mass is low. e.g. in babies or children.
- (viii) Steroid eye drops (Dexamethasone 0.1% 4 times a day for 6 weeks) were shown to reduce plasma cortisol levels [2].
- (ix) Overt Cushing's syndrome has occasionally been reported; eg an adult who presented with diabetes and cushingoid features after longterm steroid drop use [3], and steroid eye drops causing Cushing's syndrome in a baby after drop treatment following lensectomy [4]. In both cases the endocrine abnormalities reversed when the drops were stopped.
- (x) Eye drops containing Dexamethasone 0.1% used intranasally for epistaxis produced Cushing's syndrome in 3 months in a 6 year old girl. The authors consider that much of the dose was probably swallowed [5].

- (xi) Prescribed steroid eye drops may not always be used in the manner directed underlining the importance of the GP reviewing indications and systemic outcomes of repeat prescriptions.

## **Steroids and raised intraocular pressure (IOP)**

- That steroid drops caused a rise in intraocular pressure was initially recognised in the 1960s.
- An IOP rise was reported in 76% of patients with known glaucoma, and 16% of volunteers with no glaucoma history after 1-2 months' treatment with betamethasone 0.1% 4 times daily [6].
- Initially, IOP rises are reversed by stopping the steroid drops.
- However continued steroid use creates optic disc and visual field damage identical with open angle glaucoma.
- Glaucoma progression is asymptomatic and all patients using topical steroid are recommended to have ophthalmological follow up, especially those with established or suspected glaucoma [7].
- The link between systemic steroids and development of glaucoma is less clear, although outflow obstruction is believed to occur in those on systemic steroids. It is recommended that people with glaucoma or family members have regular IOP checks if using long term systemic steroid.

## **Steroids and Cataract**

- Topical and systemic steroids are associated with increased and earlier risk of cataract.
- There is less evidence to implicate inhaled steroids [8].

## **Steroids and suppression of immune response**

- Herpes virus infection of the corneal epithelium (dendritic ulcer) is made worse by use of topical steroids, which enhance viral replication and ability to invade the cornea. Full thickness involvement occurs [9].
- Steroid drops should also be avoided with fungal and bacterial infections.
- They are believed to increase length of time active virus is shed in the tears in viral conjunctivitis and are not recommended as first line therapy.

## **Steroids and Central Serous Chorio-Retinopathy (CSCR)**

- (i) Macular oedema with fluid blisters in the outer retina may develop in susceptible individuals. This is termed central serous chorio-retinopathy.
- (ii) CSCR is more common in middle-aged males with Type-A personalities and psychological stress and may occur in association with use of topical, systemic or inhaled steroids.
- (iii) CSCR causes episodic visual loss when involving the macula. Permanent loss may occur.
- (iv) The mechanism is unknown but recent evidence implicates a retinal mineralocorticoid receptor (MR) that may mediate the effect with fluid retention similar to that of the kidney. This raises the possibility of MR antagonism as therapy for non-resolving CSCR [10].

### **Bottom line – should GPs prescribe topical steroids?**

- The Royal College of Ophthalmologists in its Ophthalmic Service Guidance for Primary Care 2013 recommends: ‘Slit lamp examination is required for any patient who requires prescription of topical steroids and in any patient who has a history of contact lens wear’ [11].
- Although the RCOphth recommendation is widely accepted, there are published guidelines that consider GP steroid prescribing appropriate [12].
- It would seem sensible for the GP without specialist ophthalmology skills and equipment not to initiate topical steroids.
- But to leave the final words to a 1986 BMJ editorial [13] that advised
- ‘Topical steroids should never be given for an undiagnosed-red eye. Many consultant ophthalmic surgeons believe that treatment with such drugs should never be initiated by a general practitioner without an ophthalmic opinion. Nor should treatment be repeated or renewed by general practitioners without regular ophthalmic review to eliminate the possibility of steroid induced glaucoma or the onset of unsuspected secondary infection. Unfortunately, those most in need of instruction will probably not be reading this journal’.

### **Medicolegal implications of GP filling repeat prescriptions**

- For repeat prescribing, it is recommended to review the prescription and give the patient clear guidance. Case reports in medico-legal journals illustrate that it is not the repeating of topical steroids per se that puts the GP at risk but the failure to warn about side effects and of repeating the prescription without reviewing the need for the steroids. Also if vision problems occur, it is best to refer to an ophthalmologist and at least check visual acuity.

- Medical and Dental Defence Union of Scotland commenting in a case of cataract after topical steroids for uveitis recommends: Review repeat prescriptions and issue clear written instructions with warnings about overuse and possible side effects
- <http://www.mddus.com/resources/resource-type/publications/summons/2006/summer-2006/overuse-of-steroid-eye-drops-medical-case-study/>
- Medical Defense Union commenting in a case about steroid induced glaucoma resulting in blind eye from repeat prescriptions, the patient having complained of loss of vision. Recommendation from MDU was for the GP to have referred the patient to HES as soon as she complained of vision problems, tested her acuity and refused to repeat prescriptions after a short time.
- <http://www.themdu.com/guidance-and-advice/case-studies/steroid-induced-glaucoma>
- Further advice from Glasgow Drugs and Therapeutics committee concerning steroid drops after cataract surgery recommended that the intended duration of treatment should be clearly stated on discharge information. Drops should not be prescribed indefinitely after cataract surgery  
<http://www.ggcprescribing.org.uk/blog/safe-prescribing-corticosteroid-eye-drops/>

## e-Learning for Health

The RCGP and Department of Health have created an e-learning site for GPs:  
<http://www.e-lfh.org.uk/projects/egp/index.html>

## Useful resources

Information for patients using topical steroids:  
<http://www.everydayhealth.com/drugs/class/ophthalmic-steroids>

## People involved in creating this resource

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