# Red eye

## Introduction

## Red eye is a condition where the white of the eyes (sclera) have become reddened or bloodshot. It most commonly results from dilatation of blood vessels in the anterior portion of the eye. Diagnosis may be aided by differentiation between ciliary and conjunctival injection. Ciliary injection involves branches of the anterior ciliary arteries and indicates inflammation of the cornea, iris or ciliary body. Conjunctival injection mainly affects the posterior conjunctival blood vessels. Because these vessels are more superficial than the ciliary arteries, they produce more redness. Haemorrhage into the subconjunctival space may also present as red eye.

## Causes of red eye

### Conjunctivitis

The most common cause of red eye, characterized by vascular dilatation of the superficial conjunctival blood vessels, cellular infiltration and exudate. It must be differentiated on the basis of aetiology (viral, bacterial or allergy):

* **Allergic conjunctivitis** - often presents with pruritus in individuals with atopy.
* **Viral conjunctivitis** - tends to be associated with enlarged, tender preauricular nodes, watery discharge and upper respiratory tract infection.
* **Bacterial conjunctivitis** - tends to be associated with more mucopurulent or purulent discharge.

### Subconjunctival haemorrhage

Results from bleeding of the conjunctival or episcleral blood vessels into the subconjunctival space. The classical presentation involves a patient without eye pain or visual disturbance who discovers the red eye in the mirror or from a friend or family member. Usually self-limiting condition when not associated with systemic illness or significant trauma.

Causes include:

* Idiopathic
* Valsalva (eg coughing, straining, weightlifting, working under a sink**)**
* Traumatic (eg mild isolated lesion due to eye rubbing or sports injuries)
* Hypertension or arteriosclerosis
* Bleeding disorders ( if recurrent or in young patients without a history of trauma or infection), including hematologic or hepatic disease, diabetes, systemic lupus erythematosus, parasites and vitamin C deficiency
* Various antibiotics, anticoagulants (eg warfarin), analgesics (eg NSAIDS), steroids, contraceptives and vitamins A and D
* Normal sequel of ocular surgery, even if there is no conjunctival incision
* Febrile systemic infections such as meningococcal septicaemia, scarlet fever, typhoid fever, measles, yellow fever, malaria, rickettsia and sandfly fever

### Other causes

* **Glaucoma** (acute angle closure) – patients are usually older than 50 years of age and complain of a severely painful eye. Nausea and vomiting are common due to elevated intraocular pressure. **This is a true emergency!**
* **Iritis** – inflammation of the anterior uveal tract. In most cases, the cause cannot be determined, however, it can be caused by any systemic inflammatory disease. Trauma is a common cause.
* **Scleritis** – universally accompanied by pain, especially with tenderness exacerbated by digital pressure. Gradual onset of red eye and insidious decrease in vision are typically noted. Bilateral in 50% of patients.
* **Blepharitis** – inflammation of the eyelids, usually involving the lid margins. It may be seborrhoeic or may be caused by staphylococcal infection.
* **Keratitis** – inflammation of the cornea and can be bacterial, viral, fungal or parasitic.
* **Pterygium** – a benign conjunctival growth made of triangular band of fibrovascular tissue caused by long-term exposure to ultraviolet light, dust and low humidity. Usually arises from the nasal side of sclera and encroach onto cornea.
* Corneal injury
* Dry eye syndrome (keratoconjunctivitis sicca)
* Canaliculitis
* Trauma
* Dacryocystitis

## Presenting symptoms and signs

* Burning sensation
* Watery eyes
* Itchy eyelids
* Itchy eyes
* Swollen eyelids
* Discharge; could be thick or watery
* Foreign body sensation
* Photophobia (light sensitivity)
* Dermatitis (crusting or scaling of the eyelid skin)
* Eyelashes falling out. This is typically associated with blepharitis
* Redness
* Pain
* Bilateral or unilateral

## Examination findings

It is important to look closely and check if the eye itself is red or if the problem primarily affects the tissues around the eye. Also look at the whole patient to identify systemic problems that might affect the eyes. In children, this could be measles. In adults, connective tissue diseases are more likely.

Perform a complete ophthalmologic examination on all patients, to include the following:

* Visual acuity (each eye should be tested separately)
* Extraocular movements
* Pen light examination (should test for pupil reactivity, pupil shape, discharge, pattern of injection and corneal injection)
* Test for direct and consensual photophobia

Further examinations that are not available at MRCG, but are useful include:

* Slit lamp examination
* Anterior chamber evaluation
* Intraocular pressure (IOP) measure

## Management

The key to management is making the correct diagnosis in a timely fashion. Uncomplicated cases of conjunctivitis and subconjunctival haemorrhage may be managed by a primary care physician. Subconjunctival haemorrhage with no history of trauma does not require treatment. See below for treatment of conjunctivitis.

Other possible causes of red eye require ophthalmologic consultation within an appropriate time period.

Emergency referral to eye hospital

* Acute angle closure glaucoma – affects a single eye, which has reduced vision and is exquisitely painful.
* Penetrating trauma – affects a single eye which has been penetrated.

Urgent referral to eye hospital

* Iritis, scleritis – usually bilateral, painful and in context of systemic disease.
* Non-penetrating trauma – usually unilateral. May be painful, but less so than in glaucoma. Given topical antibiotics prior to referral.

Routine referral to eye hospital – blepharitis, keratitis, pterygium, unclear diagnosis in absence of concern for more urgent diagnoses, conjunctivitis or haemorrhage which have not improved as expected.

Treat in OPD – conjunctivitis – treat with topical antibiotics. Tetracycline eye ointment should be inserted twice each day except in more complex cases. The ointment is placed along the bottom lid and then the patients encouraged to blink to spread it over the conjunctiva. Allergic conjunctivitis is treated with topical antihistamines.

## Key Issues for Nursing care

Refer the following patients to a doctor immediately

* Patients with sudden changes in vision
* Severe pain accompanying redness
* Red eye with accompanying fever of over 38.3 °C (101 °F)
* Red eye caused by blunt or penetrating trauma
* Red eye associated with facial swelling ( neck, lips, tongue etc)
* When red eyes are persistent or recurrent

## References

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Kunimoto DY ,Kanitkar KD, Makar M. Diagnosis and treatment of eye disease

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| **Written by:** | Name: Mariama Sonko | Date: 01 July 2019 |
| **Reviewed by:** | Name: Karen Forrest | Date: 24 July 2019 |
| **Version:** | **Change history:** | **Review due date:** |
| 1.0 | New document | 30 August 2021 |
| Review Comments (*if applicable)* |  |  |