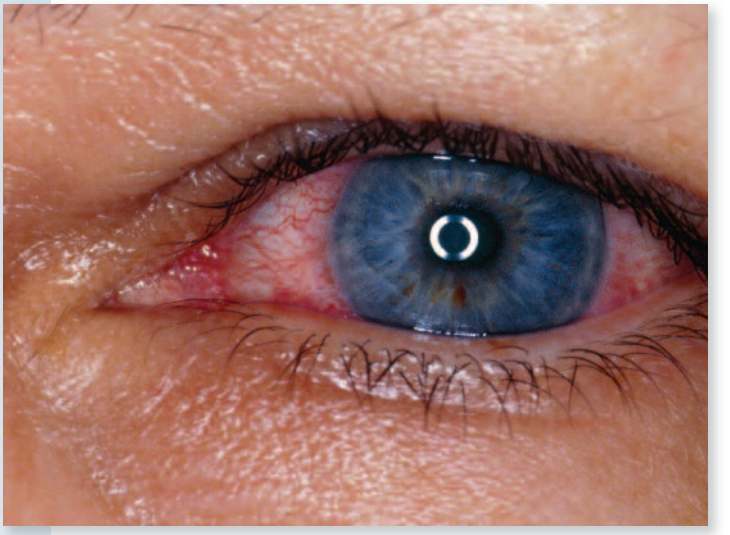
Anterior uveitis: is this the cause of a red eye?



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Anterior uveitis is the most common form of ocular inflammation. Patients usually respond well to topical treatment but should be screened for vision-threatening complications.

MedicineToday 2012; 13(2): 58-60

Uveitis is defined as inflammation of the uveal tract. The uvea is the tissue and structures of the eye between the tough outer scleral layer and the innermost retina and is anatomically divided into the iris, ciliary body and choroid. Uveitis may be classified according to its aetiology or clinical features; however, it is conveniently described in terms of the affected structures. Anterior uveitis is inflammation affecting the iris (iritis) or anterior ciliary body (iridocyclitis). Intermediate uveitis affects the posterior ciliary body (pars planitis) and peripheral retina, often manifesting with inflammatory cells in the vitreous. Posterior uveitis involves the choroid and posterior retina, whereas panuveitis involves the entire uveal tract.

Inflammation in each part of the uvea manifests in different ways according to the structures affected, their sensitivity to pain and their propensity to affect vision. Anterior uveitis tends to cause pain and photophobia in addition to redness of the eye. Intermediate uveitis may simply present with mild visual loss or floaters due to inflammatory cells or debris in the vitreous, whereas posterior uveitis may cause mild to profound visual loss, floaters and occasionally other symptoms, such as visual field loss and photopsias, depending on which areas of the retina are involved.

DIAGNOSIS

Anterior uveitis is a common cause of red eye, which accounts for about 90% of all presentations of uveitis. Patients will often present to their GP, particularly during their first episode. Sometimes the signs and symptoms may initially be mistaken for conjunctivitis; however, there are a few key differences (see Table). Uveitis may affect both eyes, although presentations are more commonly unilateral. Patients with uveitis usually present with eye redness, pain and photophobia but without any discharge. Visual acuity may be reduced, depending on the severity of the inflammation; however, it is often normal. In contrast, conjunctivitis more typically presents with irritation rather than pain, purulent or mucoid discharge and an absence of photophobia. Eyesight is usually unaffected in patients with conjunctivitis, particularly early on in the illness.

Patients with acute anterior uveitis will usually have a red eye, which may be diffuse or localised to the limbal region (Figure 1). A crucial sign in distinguishing acute anterior uveitis from the many other causes of a red eye is the presence of inflammatory activity in the anterior chamber. In mild or early episodes

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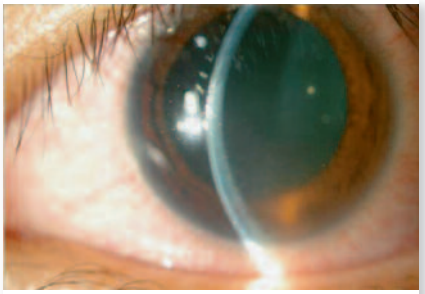

Figure 1. Anterior segment photograph showing limbal hyperaemia and intraocular inflammation due to anterior uveitis.

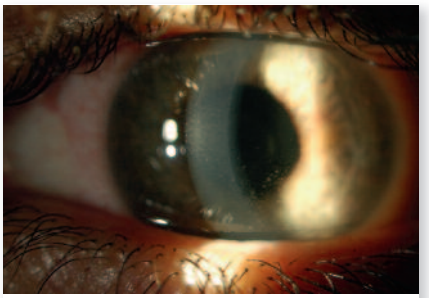

Figure 2. Anterior segment photograph showing keratic precipitates on the posterior corneal (endothelial) surface.

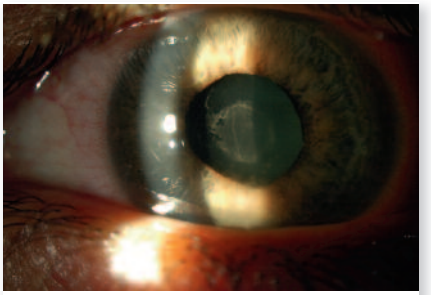

Figure 3. Anterior segment photograph showing fibrin plaque on the anterior lens capsule.

only occasional white cells will be found in the anterior chamber. More severe acute anterior uveitis can cause inflammatory debris to settle on the corneal endothelium as keratic precipitates (Figure 2), or as fibrin on the anterior lens capsule and anterior chamber structures (Figure 3).

INVESTIGATION FOR ASSOCIATED SYSTEMIC CONDITIONS

Once a diagnosis of acute anterior uveitis is established, attention should be given to any associated systemic conditions the patient might also have (see the box on page 60). Up to half of patients with acute anterior uveitis will have a related systemic condition. Among adults, the most important associations are the seronegative arthropathies, sarcoidosis, syphilis and tuberculosis. In children, juvenile idiopathic arthritis is the most common associated systemic disease.

Thorough clinical history taking and examination will direct appropriate investigation of possible systemic associations and may include questions related to travel, sexual behaviour and tuberculosis exposure.[1] It is useful to test for the common and treatable associations even after a first attack as delayed diagnosis of some of these conditions may have significant consequences. In adult patients, it is necessary to perform syphilis serology and angiotensin-converting enzyme testing as a marker for sarcoidosis. A chest x-ray is performed for patients with asymptomatic pulmonary sarcoidosis. If there is reason to suspect exposure to tuberculosis then a Mantoux or QuantiFERON gold test is included in the work up. Further laboratory and radiological investigations are guided by the results of a thorough history and review of systems. Tertiary uveitis centres and research units commonly ascertain the human leukocyte antigen (HLA) B27 status of patients with anterior uveitis.

Although half of patients with acute anterior uveitis will have an isolated episode of ocular inflammation, diagnosing a treatable underlying systemic condition allows for appropriate and timely management of these conditions. The most common association is the presence of the *HLA B27* gene and although this in itself is not a disease, 50% of patients with this gene will have another B27-related disorder.[2] Patients with this genotype are known to experience more severe episodes of acute anterior uveitis, which often require more aggressive topical corticosteroid treatment, and have an increased risk of recurrence.

TABLE. DIAGNOSTIC CHARACTERISTICS OF ANTERIOR UVEITIS AND CONJUNCTIVITIS

Characteristic	Anterior uveitis	Conjunctivitis
Hyperaemia	Often diffuse, but sometimes with more prominent limbal hyperaemia	Diffuse
Visual acuity	Often normal, but sometimes a mild to moderate reduction	Generally unaffected
Discharge	Increased lacrimation may sometimes occur, but no purulent or mucoid discharge	A purulent, watery or mucoid discharge will be noted
Pain	Photophobia and dull eye pain, unrelieved by topical anaesthetics administered during examination	Usually no pain, however, surface irritation and discomfort can occur
Pupil	May be constricted or distorted by formation of synechiae	Not affected
Cornea	Usually clear, however, keratic precipitates may be noted on the corneal endothelium on slit lamp examination	Clear

COMMON CAUSES OF ACUTE ANTERIOR UVEITIS

Systemic conditions

- Presence of the *HLA B27* gene
- Juvenile idiopathic arthritis
- Sarcoidosis
- Syphilis
- Tuberculosis
- Behçet's disease
- Inflammatory bowel disease
- Spondyloarthropathies
- Reactive arthritis

Ocular conditions

- Fuchs heterochromic iridocyclitis
- Posner–Schlossman syndrome
- Herpetic eye disease

TREATMENT

Topical corticosteroids and cycloplegic eye drops are the mainstay of treatment for patients with acute anterior uveitis. The frequency with which eyedrops are administered depends on the severity of the inflammation. Typically, dexamethasone 0.1% or prednisolone acetate 1% eyedrops are used intensively each waking hour or so in the first week, and then tapered slowly over six to 10 weeks according to the clinical response. Cycloplegic eyedrops, such as atropine 1% or homatropine 2%, are used to dilate the pupil. These eyedrops reduce the pain associated with ciliary body spasm and limit contact between the iris and lens, preventing their adherence (posterior synechiae). Patients with this condition require treatment for at least six weeks.

In the small number of patients resistant to topical treatment, periocular or oral corticosteroids are used. Dexamethasone or triamcinolone may be injected subconjunctivally or into the orbital fat as an orbital floor injection. In patients who have extremely severe uveitis or severe vision loss from secondary macular oedema, oral prednisolone may be given.

In patients with HLA B27-associated recurrent uveitis or chronic anterior uveitis, immunosuppressive agents may occasionally be required. Both sulfasalazine and methotrexate are effective in decreasing recurrent attacks. In patients with severe refractory anterior uveitis with vision loss from secondary macular oedema, biological agents such as anti-tumor necrosis factor and anti-CD20 therapy can be effective but are fortunately rarely required.[3]

VISION-THREATENING COMPLICATIONS: WHAT NOT TO MISS

Anterior uveitis is associated with several sight-threatening ocular complications, including cystoid macular oedema, cataract and glaucoma. Inflammatory mediators may damage the integrity of the blood–ocular barrier, resulting in the accumulation of fluid within the macular tissues. Cystoid macular oedema may become chronic, and is reported to cause up to 30% of blindness in patients with uveitis.[4] Treatment of this condition involves the use of orbital floor or intravitreal corticosteroid injections and, in some patients, systemic corticosteroids and immunosuppressive therapy.

Cataract is another significant cause of visual loss associated with anterior uveitis. Recurrent or chronic anterior uveitis may directly induce formation of lens opacities. In addition, corticosteroids, the mainstay of management of uveitis, are well known to cause or hasten the formation of cataract. Fortunately, cataract surgery can generally restore visual loss from uveitic cataract.

Patients with anterior uveitis are at greater risk of glaucoma. Inflammation in the anterior segment may directly damage the trabecular meshwork, leading to elevated intraocular pressure. Alternatively, corticosteroid medications may also induce glaucoma. The management of uveitic glaucoma involves judicious use of corticosteroids and other immunomodulating drugs, intraocular pressure lowering medications and glaucoma filtration surgery.

SUMMARY

Anterior uveitis is the most common form of ocular inflammation. It usually presents acutely and responds well to treatment with topical corticosteroids and cycloplegic eyedrops. All patients with this condition should be screened for systemic associations, with careful history taking and targeted investigations.

Few patients with anterior uveitis will fail to respond to topical treatments and may require periocular corticosteroids or systemic medications. Recurrent attacks of acute anterior uveitis are common among patients with the *HLA B27* gene or untreated associated systemic conditions. Anterior uveitis is usually a self-limiting condition with a good visual prognosis, but sight-threatening complications do occur, particularly in patients who develop chronic anterior uveitis.

The successful management of anterior uveitis and its complications involves careful diagnosis and management of any associated conditions, appropriate treatment of ocular inflammation and management of any complications that may arise. MT

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COMPETING INTERESTS: None.