The effects of systemic illness on the eye and vision

Patients present to the A&E department with a multiplicity of simple and more complex problems. Many systemic illnesses give rise to ocular symptoms and eye problems which are part of a systemic problem. These may be discovered accidentally during comprehensive physical examination, or may manifest as part of the patient’s presenting problem or as a single presenting problem which can aid in identifying the systemic disease. It is important that A&E personnel are aware that apparent eye problems may be linked to significant systemic pathology.

It is beyond the scope of this article to include descriptions of all eye problems which may be linked with more general illness. Discussion, therefore, will concentrate on the eye problems associated with some of the more common disease processes.

Diabetes

Diabetes is the major systemic cause of blindness in the western world and the incidence of blindness in people with diabetes is 20 times that of the rest of the population. Approximately 2 per cent of all people with diabetes eventually have vision which is poor enough to make them eligible for blind registration and diabetic retinopathy is the commonest cause of blind registration in people between the ages of 20 and 65 (Perry and Tullo 1995). The incidence of diabetic eye disease is closely linked to the duration and control of diabetes.

The onset of type one diabetes usually occurs in younger patients and is often fairly acute. Treatment tends to commence fairly early in the course of the disease and, if control is maintained, eye problems may be delayed for a number of years. The onset of type two diabetes, however, can be insidious and may only be recognised due to the onset of diabetic complications such as eye disease. Twenty per cent of type two diabetics have retinal changes at the time of diagnosis. The disease may have been present for quite some time, perhaps years, with multisystem complications well under way.

There are many more patients with type two diabetes who have blinding eye disease, partly because of the greater numbers of people with this type of diabetes but also because of delays in diagnosis and management. Ophthalmic symptoms from diabetes are generally linked to lens or retinal problems.

Lens problems

Patients with poor glycaemic control frequently experience changes in the structure of the lens within the eye and, therefore, of the focusing power of the eye resulting in reduced vision. Temporary changes occur in the focusing power of the eye as the lens becomes slightly swollen or dehydrated due to absorbing or losing fluid by osmosis when blood glucose levels fluctuate. Common presenting symptom associated with this is blurring of vision. This is occasionally seen as the only presenting symptom of diabetes. Patients who have diabetes newly diagnosed in A&E or in outpatient clinics should be reassured that these visual changes are temporary and that they should not visit an optometrist for an eye test.

New vessels at the optic disc with a haemorrhage into the retina which will significantly reduce vision.
Cataract extraction is undertaken more frequently and at an earlier age in adult diabetics than in the general population, so cataract should be kept in mind as a possibility if a diabetic patient presents with gradual and progressive blurring of vision.

Retinal problems

Retinal problems caused by microangiopathy are the cause of most incidences of sight loss in patients with diabetes. Blood vessels in the retina are increasingly permeable, resulting in haemorrhages and exudates. Retinal ischaemia stimulates the production of vasoformative factors which result in neovascularisation. The new vessels do not have tight cell junctions and leak into the retina (retinal haemorrhage) and pre-retinal haemorrhages will leak into the vitreous (vitreous haemorrhage). Both conditions will result in loss of vision as the blood compromises the pathway for light to hit the retina.

Patients may present with sudden, painless loss of vision and any history of diabetes may suggest the possibility of haemorrhage although other causes should not be discounted. The patient is likely to be frightened about this development and may need a great deal of information and reassurance. Patients who have experienced this problem before are likely to advise A&E staff of the cause of their problem. In all cases, referral should be to an ophthalmologist although immediate treatment is unlikely to be undertaken as, if the patient cannot see out of the eye due to haemorrhage, the ophthalmologist will not be able to see enough detail in order to carry out the usual treatment, laser and will have to wait until the haemorrhage settles.

Another endocrine disorder which may include eye problems as part of the disease process is malfunction of the thyroid. Hyperthyroidism is caused by thyroid stimulatory immunoglobulins which are directed towards thyroid stimulating hormone receptors (Chang et al 1997). The major abnormality in thyroid eye disease is associated with inflammation and enlargement of the orbital tissues and particularly the muscles surrounding the eye. (Onoefrey et al 1998). This may result in the eye being pushed forwards by the enlargement of the tissues in the orbit, resulting in clinical features such as discomfort and foreign body sensation, bulging or staring eyes, puffy eyelids and double vision. Loss of vision may result from compression of the optic nerve. The discomfort and gryness is likely to be due to dry eyes caused either by incomplete lid closure because of the position of the eye (exophthalmos) or by insufficient tear production due to conjunctival involvement.

Double vision is due to inflammation and fibrosis of the extraocular muscles resulting in unequal power distribution between the muscles of the two eyes. If one of the eyes...
systemic illness

Stevens Johnson syndrome showing erythema of the eyelid which arises from a serious toxic reaction to some drugs, particularly sulphonamide drugs.

moves more than the other, double vision will result. These ocular symptoms may be part of a pattern which includes the general symptoms of hyperthyroidism: weight loss, palpitations, tremor, tachycardia and irritability and heat intolerance. Treatment is carried out in specialist endocrine clinics but a referral to an ophthalmologist is essential in order that the ocular manifestations may be assessed and treated. Artificial tears may be prescribed to relieve dryness and if it is obvious that the lids do not close completely, and there is a possibility of corneal exposure, patients should be taught how to tape their eyelids closed at night after instillation of a bland ointment such as simple eye ointment.

Eye problems are encountered less often in patients with hypothyroidism, but this may result in lid oedema, loss of eyebrow hair, particularly of the lateral third of the eyebrows and inflammation or atrophy of the optic nerve may occur.

A number of collagen disorders have significant effects on the tissues of the eye: rheumatoid arthritis is linked particularly with episcleritis, keratoconjunctivitis sicca or dry eyes and inflammatory corneal ulceration. Episcleritis is generally seen as a red area on the white of the eye. It is inflammation of the top layers of the sclera and may cause irritation or aching. Although this is a self-limiting condition, the unpleasant symptoms warrant referral to an ophthalmologist for treatment which is usually non-steroidal anti-inflammatory drugs or drops or, less often steroid drops. Dry eyes may be a major problem for the patient and may dominate their lives. Their eyes are constantly painful, with a permanent foreign body sensation. Treatment is aimed at augmenting the tear film with artificial tears such as hyaluronate or thicker solutions such as polyvinyl alcohol (such as Sno tears). The drops may be used frequently and patients should be encouraged to instil them at least hourly and by trial and error, find a time interval to which their eyes are always comfortable. The drops should not be instilled when the eye becomes gritty again, but before that stage occurs. Patients need to be aware that dry eyes do not, on the whole, resolve, but that the drops may be needed more or less frequently at different times. Inflammatory ulceration of the cornea may present major problems for sufferers of rheumatoid arthritis and progressive corneal melting may take place. Patients should be encouraged to seek an ophthalmic opinion if any new eye symptoms appear or if their dry eyes become unmanageable.

Ankylosing spondylitis is a seronegative spondyloarthropathy which is characterised by chronic inflammation of the cartilaginous joints of the skeleton resulting particularly in fusion of the spine and sacroiliitis. Twenty per cent of people with ankylosing spondylitis will suffer from anterior uveitis (Pavan-Langston 1996). The most common presenting symptoms of uveitis are photophobia, pain due to iris and ciliary spasm, conjunctival redness (injection), and decreased visual acuity. The reduction in vision is due to protein and white blood cells which are part of the inflammatory reaction in the anterior chamber. The pupil, because of spasm and inflammation, is likely to be small (miosis) compared with the unaffected eye and may react sluggishly. Treatment is with steroid and mydriatic (dilating) eye drops. Uveitis is often recurrent in these patients and may be frequent so, if the patient has a recurrence of uveitis, it is likely that he or she will know – and will identify symptoms – before they are clinically visible. Ophthalmologists generally accept the patient’s view of this condition and treat it before it becomes clinically obvious. It is important therefore, that patients with this condition are referred appropriately. Patients with systemic lupus erythematosus may develop associated conjunctivitis, episcleritis, dry eyes and/or uveitis affecting both the anterior and posterior segments of the eye.

Patients with haematological disease may present to A&E with a variety of ocular symptoms as the presenting problem. Patients with anaemia may suffer repeated subconjunctival haemorrhage. Patients with thrombocytopenia or leukaemias may have associated retinal oedema and haemorrhage resulting in loss of vision. Sickle cell disease may also result in retinal and vitreous haemorrhages with symptoms of sudden reduction in vision and these patients often have comma shaped conjunctival vessels as a feature of their disease. AIDS is a multisystem disorder and, not surprisingly, it may affect the eyes. Uveitis is common and retinal haemorrhages and exudates, vasculitis and periphlebitis can all reduce vision. The HIV may produce all these...
Alcohol causes many ocular side effects. In acute alcohol toxicity, the pupils become dilated initially, but are miosis if the patient is comatose.

References