Nursing and Midwifery
A Practical Approach

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Care of patients with problems affecting the eyes

The structure of the eye

- Are there problems with reading or distance work? These patients may benefit from spectacles.
- Are there problems with the whole visual field or just part of it?
  - Central blurred vision is found in cataract.
  - Peripheral vision and central loss is seen in glaucoma.
- Are there specks or strands seen in the field of vision? These suggest lesions in the front of or on the retina. These patients should be referred.
- Is there a family history of problems? The examination of the eye should include an inspection to see if there is any inflammation, irritation, watering or other obvious signs of problems.

Eye examination

Visual acuity: This can be tested using a Snellen's chart. Normal vision is expressed at 6/6. If even the biggest letters cannot be read, see if the patient can count your fingers at different distances or whether they can only see a light shine into their eyes (perception of light).

Torch: Use a torch with good batteries that can be focused to a small beam. Darken the room and then shine the torch in the eye to examine eyes and eyelids. It can also be used to test whether the pupils constrict normally.

Local anaesthesia: Certain procedures may need local anaesthetic drops, usually methocaine or benoxinate drops. They may sting at first.

Fluorescein: This is a dye which can be used to show corneal abrasion, ulceration or foreign bodies. The dye is orange but looks green when instilled in the eye. It is best to use it dry on tips of soft paper. This is first touched inside the lower eyelid (not the eye), till the stain flows into the tears.

Lid eversion: Ask the patient to look down, then catch the upper lashes in your fingers and pull them down and out. With your finger or pen against the outside of the eyelid, flick the eyelid inside out and examine its...
inner surface. This should not be done if the eyelid is inflamed.

**Visual field**: This is to test the extent of the person’s field of vision. There are special pieces of equipment for testing this.

**Colour vision**: Some people have problems with seeing colours. Red and green are the ones that often cause problems. The person is said to be colour-blind.

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**Injuries to the eye**

Injuries to the eye can arise from physical objects or chemicals. The eyelids and the bony orbit of the eye can protect from physical injuries but not from chemicals. Once you have asked what happened, inspect the eye for obvious injury, tiny punctures, visible objects or objects protruding.

**Sub-conjunctival haemorrhage**

There can be leakage of blood from the blood vessels into the conjunctiva. The ‘white’ of the eye looks very bloodstained, but there is no pain (unless associated with trauma) or discharge. This common condition can occur spontaneously, usually in an older person or after trauma or coughing. No treatment is necessary if the sub-conjunctival haemorrhage is the only problem, and the patient should be reassured. However if the bleeding persists, it may be a sign of HIV and AIDS.

**Foreign bodies**

Small foreign bodies are often found embedded in the conjunctiva or cornea. Examples of these are dust, insect wings, pieces of metal, glass or wood.

The patient will complain of feeling something in the eye, watering and blurring of vision if the foreign body is in the cornea. Metal and other foreign bodies can scratch the cornea causing severe pain and irritation. Sharp objects can penetrate the eye and result in *hyphaema* (blood in the anterior chamber) or *hypopyon* (pus in the anterior chamber). Corneal ulcers resulting from a foreign body can be diagnosed by staining the eye with fluorescein 1% and then examining it with a blue light.

**Treatment**

If the foreign body is superficial:

- Instil local anaesthetic drops.
- Remove the foreign body using a clean swab. Evert the eyelid if necessary.

If the foreign body is embedded in the cornea:

- Instil local anaesthetic drops.
- Remove using a small sterile needle.
- If possible, refer the patient for checking by an eye-care health worker. Never try to remove a deeply embedded foreign body, always refer the patient.

**Blunt, non penetrating injuries**

Common injuries are:

**Corneal abrasion**: This will be revealed by fluorescein stain. Use antibiotic ointment and cover with a pad for a few days.

**Traumatic iritis**: The eye will be red, watering and painful, especially in bright light. There may be a tear in the iris. Instil atropine until the redness subsides.

**Hyphaema**: If less than half the anterior chamber is full of blood, keep the patient quiet and instil atropine ointment. If more than half the anterior chamber is full, the pressure inside the eye will rise which can lead to blindness. The patient should be treated with Diamox and kept quiet. It may be necessary for the blood to be washed out of the chamber. The patient should be referred to a specialist centre if possible.

**Penetrating injuries**

Severe ones should be referred at once. A torn conjunctiva will heal well, but if there are deeper wounds they need specialist treatment. Do not instil any ointment or drops but cover the eye with a pad and send to the eye-care health worker.

**Burns and chemical injuries**

Acids or alkalis can enter the eye either by accident or by assault. Steam, hot water or ashes can cause damage. The patient presents with inflammation, a feeling of foreign bodies in the eye, lacrimation, pain and visual disturbances. This is an emergency and treatment must begin immediately.

**Treatment**

- The eyes should be washed out with water, continuing for 10–15 minutes if necessary. Milk is an alternative, particularly if the irritant is known to be an acid.
- The patient should then be referred urgently to a specialist centre.
Cataracts
Cataracts are opacities of the lens inside the eye. They may be congenital or acquired. Cataracts are responsible for 20 million cases of blindness worldwide.

Congenital cataracts
These are often seen when the mother has had a viral infection, commonly rubella, especially between the 9th and 12th week of pregnancy.

Acquired cataracts
These may be due to:
Old age: This is the commonest form of cataract and the main cause of blindness around the world. It is not often seen before the age of 40 but then becomes increasingly common.
Diabetes: Constantly high blood sugar can damage the lens. Diabetes that is not well controlled will make this more likely. It may be seen in younger patients.
Trauma: A cataract can develop following an injury.

Signs and symptoms
There is no pain. Patients with age-related cataract will complain of poor vision that is slowly getting worse.

Treatment
- The patient is referred for surgical removal of the lens under local or general anaesthetic. The best method of surgery is to have an artificial lens placed inside the eye. Alternatively, spectacles will have to be worn after the operation.
- Following surgery, steroid/antibiotic drops are instilled for about 2 weeks.
- Patients should be advised not to lift heavy objects which could increase pressure within the eye.
- They should return in 6–8 weeks (or when the surgeon advises) to have their eyes tested and collect spectacles if necessary.

Gonococcal conjunctivitis
This is common in newborn babies who are infected during birth from a maternal genital infection. It can rapidly progress to corneal ulceration and blindness, so treatment should be started quickly. In many areas it is routine to wipe the babies eyes immediately after birth, and instil tetracycline eye ointment or silver nitrate 1% drops.

Signs and symptoms
These will be seen within the first 48 hours following birth:
- The eyes are swollen and there is a heavy purulent discharge.
- An eye swab will grow the gram-negative organism Neisseria gonorrhoea.

Treatment
- The baby should be nursed away from other newborns if possible.
- Nurses must wash their hands carefully before and after giving treatment.
- Take a swab if there are laboratory facilities available.
- Wipe the eyes (not the cornea) carefully from the inside to the outside, to prevent infection spreading into the other eye. Wipe away the pus.
- Start treatment at once. Put in penicillin drops or tetracycline ointment every 1/2 hour for 24 hours, then 2 hourly for 7 days. Mothers can be taught to do this, to save nurses’ time and make sure the treatment is continuous.
- Systemic antibiotics are needed, such as penicillin, gentamycin or kanamycin if there is no improvement after 24 hours.
- Both parents must be treated for gonorrhoea.

Chlamydia infection
These babies present with a less severe infection occurring a few days after birth. They can be treated with tetracycline eye ointment or, sometimes, erythromycin by mouth for children.

Trachoma
Trachoma is the commonest infective cause of blindness in adults, affecting 150 million worldwide and causing 5½ million cases of blindness. It is caused by Chlamydia trachomatis, carried by flies and is
highly contagious. It causes a chronic infection in children whose faces are not well washed and whose hygiene is poor. Flies feed on faeces and also discharge from the eyes. Repeated inflammation of the eye lids causes scarring. This pulls the eye lashes inwards which is called trichiasis. The continuous scratching of the cornea by the lashes causes scarring and eventually blindness.

**Signs and symptoms**

- Red inflamed eyes and a sticky discharge affecting several children in the family or school friends
- The tarsal conjunctiva under the eyelids is thick and red
- Follicles, tiny raised spots, may be seen on the tarsal conjunctiva.

**Treatment**

- Tetracycline eye ointment should be given twice daily to the whole family for 6 weeks.
- If the eye lashes are scratching the eye, the child or adult should be referred for surgery before the cornea is damaged.
- Children’s faces should be washed thoroughly every day.
- The family should be taught about good hygiene in the home, to reduce the number of flies. Fly traps made from plastic bottles can be very effective. See Appendix A on page 396.
- Latrines should be kept clean and placed away from living areas.

Remember the five ‘Fs’ in providing trachoma control in a community:

1. Flies
2. Faeces
3. Faces
4. Fingers
5. Fomites (for example towels and face cloths).

**Onchocerciasis (River blindness)**

Eighteen million people are affected by this disease, 270,000 of whom are blind. Most of these people live in sub-Saharan or West Africa. In some villages, 100 per cent of the population is affected, 10 per cent of whom will be blind. The disease is spread by a black fly that lives in well oxygenated water, usually fast running rivers. The fly spreads the worm, Onchocerca volvulus, which releases microfilaria. It is these microfilaria which are responsible for the skin and eye problems. In areas which are heavily infested, populations are forced to leave some of the most fertile land to avoid problems.

The microfilaria cause an inflammatory reaction in the eye, leading to sclerosing keratitis. It can also lead to secondary glaucoma, cataract and changes at the back of the eye affecting the retina and optic nerve.

**Treatment**

- Ivermectin (mectizan) does not cure, but can control the disease. It should not be given to pregnant women, women during the first month of breastfeeding, or children under the age of five years. It is necessary to give ivermectin once a year for some years as the worm lives for 10–12 years.
- Control of the black fly by the use of larvicides.

**Xerophthalmia: Vitamin A deficiency**

Vitamin A deficiency is a major cause of blindness in some areas, yet it is easily avoidable. It mainly affects children under the age of five years, particularly those aged one to two years who are no longer breastfeeding. Vitamin A is found in:

- Milk, meat such as liver and chicken, oily fish and eggs
- Margarine, dried skimmed milk and other foods that have had vitamin A added
- Dark/medium green and orange vegetables: carrots, tomatoes, spinach and pumpkin
- Orange fruits such as mangoes and pawpaw
- Red palm oil

These should form part of the diet from the time of weaning to prevent the deficiency.

Vitamin A deficiency is particularly high in children, because they are growing quickly so have an increased need. Some mothers are low in vitamin A during pregnancy and their babies are therefore at risk. Colostrum and breast milk are good sources. Infections increase the demand for vitamin A and children with diarrhoea do not absorb the vitamin well. The severe blinding form of vitamin A deficiency, affecting the cornea (keratomalacia), may develop acutely during a measles epidemic. Those most at risk include:

- Babies whose mothers stop breastfeeding early
- Children who are malnourished
• Children who have measles
• People with persistent diarrhoea
• People suffering from recurrent infections.

Signs and symptoms
• Night blindness. Children have difficulty in walking around in the dark and may fall over a lot. Mothers are quick to notice this, although very young children will not complain of night blindness.
• Dryness of the conjunctiva and Bitot's spots. The conjunctiva appears thickened, dry and wrinkled. Bitot's spots are 'foam-like' cream or white patches (sometimes pigmented) on the conjunctiva close to the cornea.
• The cornea becomes dry and rough (xerosis).
• Corneal ulcers (keratomalacia). These can occur suddenly and be full thickness. The contents of the eye can protrude and sight in the eye is lost. As this often happens to both eyes at the same time, the child becomes blind. This is an eye emergency.

Treatment
If you suspect that children are at risk of vitamin A deficiency, they should be treated immediately with high dose vitamin A capsules. These contain 100,000–200,000 units each. The amount of vitamin A in ordinary multivitamin capsules is not enough.
• Give vitamin A 200,000 units immediately to children over one year, 100,000 units to children under one year.
• Repeat the following day and 1–4 weeks later.
• Make sure that the child's diet contains plenty of vitamin A. Cooking oil will help with absorption.
• If there is a secondary infection of the eye, use local antibiotics.
• Give vitamin A to every child at risk.

The most important thing to remember about vitamin A deficiency is that it is preventable but when it occurs it can cause blindness.

Glaucoma

Glaucoma causes more than 10 per cent of all cases of blindness worldwide. A rise in the pressure inside the eye damages the optic disc and leads to loss in the visual field. It usually affects people over the age of 40 years, occasionally it can be congenital. In Africa and many other parts of the world, the loss of sight is usually gradual so often patients do not come for help until the condition is well advanced, when there is loss of central vision.

Treatment
• Patients should be referred to a centre where the intraocular pressure can be measured and their visual field tested.
• Early treatment is often with pilocarpine 2% eye drops and in some cases Diamox tablets. This will lower the intraocular pressure but is usually a short-term measure.
• In many cases surgery will be needed to reduce the pressure.
• Early treatment can prevent blindness. It is best to refer patients who have:
  • gradual loss of vision for no obvious cause
  • both eyes affected (usually one eye is worse than the other)
  • occasional pain and headache.

HIV and AIDS

Herpes zoster ophthalmicus

In Africa, this is often the first sign that the person has HIV or AIDS. It affects the area supplied by the ophthalmic nerve. The person usually complains of severe pain and a few days later there is a vesicular rash. When the vesicles burst, bacterial infection can occur.

Treatment
• Give Acyclovir by mouth, if available.
• Give pain relief.
• Treat secondary bacterial infection.

Kaposi's sarcoma

This rare skin tumour may involve eyelids, conjunctiva and orbit. The vascular tumour appears as a red or purple nodule on the skin of the eyelid or the conjunctiva. There may be a persistent sub-conjunctival haemorrhage. If the tumour causes problems it can be surgically removed or treated with radiotherapy.

HIV associated retinopathy

Ischaemic changes may be seen in the retina and can lead to blindness. These are caused by opportunistic infections such as cytomegalovirus (CMV). These are usually late signs and therefore not seen often, as patients usually die from other infections first. CMV can be treated with antiviral drugs (see Chapter 33).
Conclusion

Nurses have an important role to play in preventing blindness. They must be aware of danger signs and know which patients they should refer to specialist centres and which ones they can treat themselves.

Activity

What questions do you need to ask and what investigations can you do if a patient comes to the clinic complaining that they have difficulty in seeing clearly?

Health promotion

- Refer any patient with eye injury, unless the trauma is superficial.
- Chemical eye injury needs immediate washing with water.
- Treat bacterial conjunctivitis with antibiotic eye drops. If the cause of a red eye is uncertain (or does not respond to antibiotics within 24-48 hours) refer to a specialist centre.
- Ensure that mothers are not deficient in vitamin A and treat during pregnancy if there is a risk (but seek advice about dosage).
- Encourage breastfeeding which is a good source of vitamin A.
- Give advice about foods which are good sources of vitamin A.
- Give vitamin A capsules to all children at risk.
- Teach people how to reduce flies around the home.
- Wash children's faces thoroughly at least once a day.
- Teach about the importance of clean water in both the village and the home. Wells, springs and bore holes should be protected. Utensils used for carrying water should be clean.
- Teach people about sexually transmitted infections and prevention of neonatal conjunctivitis.