Children’s eye conditions

This factsheet covers children’s eye conditions. It forms part of a series of factsheets aimed at GPs

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Management of Childhood Squint in primary care

Key learning points

• Nomenclature – it is important that doctor and parent are talking about the same thing.
• Most childhood squints do not cause symptoms of double vision and failure to recognise a squint will result in amblyopia and loss of binocular function.
• Most childhood squints are secondary to refractive error.
• Control of a squint can vary during childhood and with fatigue/stress.
• Risk factors include: family history, cerebral palsy, syndromes and poor vision.
• Always examine the red reflexes to exclude intra-ocular pathology.
• **Red flag:** acute onset squint with double vision or abnormal red reflex.
• National Screening Committee Guidelines recommend orthoptist led vision
screening for all 4-5 year olds in schools, this identifies refractive error and amblyopia due to anisometropia.

Nomenclature

• A squint (strabismus) is a misalignment of the eyes and affects 2-5% of children.
• A lazy (amblyopic) eye is one with weak vision which persists when refractive error or structural abnormality is corrected.
• A refractive error is described when light is either focused in front of retina (myopia) or behind the retina (hypermetropia) or is blurred due to uneven refraction (astigmatism).
• Anisometropia is an unequal refractive state in each eye.
• A concomitant squint is one where the angle of misalignment appears similar in all directions of gaze. This is the commonest type of childhood squint.
• An incomitant squint is one where the angle of misalignment varies with direction of gaze. It is most commonly due to cranial nerve palsy but may also result from orbital pathology such as trauma and tumours. Acquired incomitant squints usually cause double vision.
• A latent squint is an ocular misalignment which a child can control. When tired or unwell, the control deteriorates and the ocular misalignment becomes evident (manifest).
• A manifest squint may be intermittent initially but become constant as the child loses control of ocular alignment.

Identifying a squint

• Parents will often be the first to notice a squint.
• Babies under 12 weeks will have variable control of ocular alignment and this should not be considered a true squint.
• Infants may appear to have a squint due to a broad nasal bridge and epicanthic folds. The corneal light reflection in these children will be symmetrically placed in each eye.
Convergent squints are best tested by drawing the child’s attention to a detailed toy held close to the child. Divergent squints are best tested with the child looking into the distance. A cover test can be performed on a tolerant child.

**Red flag:** A sensory squint may occur if the vision is reduced due to intra-ocular pathology such as retinoblastoma or cataract. It is very important to examine the red reflex in every child with a squint and comment on this in the referral letter. If the red reflex is abnormal, an urgent referral should be made.

- Cataract occurs in 4/10,000 children and causes a dull or absent red reflex.
- Retinoblastoma may cause a squint, leukocoria on flash photography or a painful red eye. The incidence of retinoblastoma is 1:200,000 live births (30–40 annually in the UK) and is usually diagnosed before the age of two. Babies at known genetic risk undergo pre-natal and post-natal hospital screening, but 60% of retinoblastoma occurs in children with no family history and may present to the primary care team.

**Red flag:** A convergent squint may also result from bilateral VI (sixth) nerve palsies due to raised intra-cranial pressure. The onset of the squint will be acute and an older child will complain of double vision. Attempt assessment of the optic nerve for papilloedema.

**Referral**

- Where there are risk factors and parental suspicion of squint, the child should be referred via local protocols to an optometrist/orthoptist.
- When an intermittent or constant squint is present, routine referral should be made to the hospital eye service.
- If the squint is of acute onset, there is associated double vision or there is an abnormal red reflex examination, referral should be urgent and the child seen by an ophthalmologist within 2 weeks.
Treatment at home

- Management of squint may include:
  - glasses
  - Amblyopia therapy: patching or atropine penalisation of the stronger eye
  - squint surgery.

References

- https://legacyscreening.phe.org.uk/vision-child
- https://www.nice.org.uk/guidance/ng12
- http://www.childrenwithcancer.org.uk/retinoblastoma
- https://chect.org.uk/

Watery and Sticky eyes in the first year of life

Key Learning points

- Congenital naso-lacrimal duct obstruction is the commonest cause of these symptoms. The eyes are white with a high tear meniscus and watery/sticky discharge. Symptoms are noticed within a few weeks after birth. The majority of cases resolve spontaneously and do not require microbiological investigation.

- Differential diagnosis includes:
  - Red flag: Neonatal conjunctivitis causes red eyes with swollen, inflamed lids and conjunctiva and a purulent discharge occurring within first month of life
  - Red flag: Corneal pathologies or congenital glaucoma can cause watery (but not sticky) eyes but additionally the infant is photophobic and the eyes are pink.
Congenital naso-lacrimal duct obstruction
- Occurs in up to 20% of infants with spontaneous resolution in most within the first year.
- Caused by a persistent membranous obstruction or occlusion of the distal end of the naso-lacrimal duct where it enters the back of the nose.
- May be unilateral or bilateral, intermittent or constant, often worse with viral infections.
- The lower eyelid skin may become red and excoriated.
- May be associated with a mucocele (swelling of the lacrimal sac just inferior to the inner corner of the eye). Digital pressure on the mucocele causes mucus reflux into the eye.
- The eye is white although occasionally secondary conjunctivitis may occur.

GP management of congenital naso-lacrimal duct obstruction
- Over 90% of cases resolve before one year of age with conservative treatment.
- Microbiological swabs are not necessary unless there is secondary conjunctivitis.
- Topical antibiotics are not necessary unless there is a secondary conjunctivitis.
- Advise lacrimal sac massage to express the discharge from the sac: the flat tip of the little finger should be placed just below the inner corner of the eye and firmly rolled from side to side. The expressed discharge should be wiped away with a pad moistened with cooled boiled water. This should be done several times a day and will allow the eye to be cleaner for longer. Many parents find this easiest when the baby is feeding.
- The child should be referred for possible syringe and probing if symptoms have not resolved by a year of age.

Differential diagnosis: Neonatal conjunctivitis
- May be unilateral but often becomes bilateral.
- Causes red eyes with marked lid swelling and copious discharge.
Can result from chlamydia, herpes simplex, and bacterial infection eg gonococcus.

Requires same day referral to paediatric ophthalmology and neonatal services.

References

- https://www.aapos.org/terms/conditions/72  Naso-lacrimal duct obstruction

Management of childhood blepharitis and lid lesions in primary care

Key Learning Points

- Blepharitis is common in children and usually responds well to conservative management.
- Occasionally, children develop a form of keratitis associated with blepharitis (blepharokeratoconjunctivitis) which can cause corneal scarring and require referral.
- Styes and meibomian cysts develop secondary to blepharitis and usually resolve with conservative management.
- Pre-septal cellulitis secondary to a surface bite/cyst or wound generally responds
well to oral antibiotics.

- Pre-septal cellulitis secondary to upper respiratory tract infection/sinusitis can rapidly develop into sight threatening orbital cellulitis and often requires intravenous antibiotic therapy.

**Blepharitis**

- Blepharitis is a chronic inflammation of the lid margins which commonly affects children, particularly if they have other skin conditions such as eczema.
- When the blepharitis affects the anterior lid margin, symptoms include red, sore eyelid margins with crusty, scaly discharge.
- When the blepharitis occurs in the posterior lid margin due to meibomian gland dysfunction (meibomianitis) the symptoms are of burning, sore eyes often accompanied by frequent blinking in children.
- Secondary styes (inflammation of the lash follicles) and meibomian cysts (caused by trapped oil within the meibomian glands inside the tarsal plates) may occur.
- Some children develop a hypersensitivity reaction to the staphylococci in the lid margins, developing a secondary keratitis (blepharokeratoconjunctivitis) which causes a red eye and photophobia (red flag symptoms).

**Management of blepharitis in primary care**

- Lid hygiene is the mainstay of treatment for blepharitis but needs to be performed regularly and long term. It can be difficult to perform in toddlers.
  - Twice daily hot compresses (about 40 degrees Celsius) for 5 minutes. There are re-heatable and microwaveable eye masks available commercially which retain heat longer than a hot flannel.
  - Massage of the tarsal plates: following hot compresses (which liquefies the trapped oil) a finger should be placed on the upper and lower lid in turn and rolled towards the lid margin (to drain the Meibomian glands).
  - The lid margins should then be cleaned of oil and crusts using a cotton bud or
make up pad soaked in a mild detergent solution (1:10 diluted baby shampoo or the eye-safe detergent solutions and moistened wipes which are available from pharmacists and optometrists).

- A lubricating ointment (or chloramphenicol ointment if inflamed styes, crusts or cysts are present) can then be applied to the lid margins with a finger-tip twice daily after lid cleaning.

- **Meibomian cysts.**
  - These are pea-like lumps in the tarsal plates of the lid which can become recurrently inflamed, occasionally becoming infected and causing pre-septal cellulitis. Often a yellow-pink lump can be seen on the conjunctival surface underlying the cyst.
  - 3-4 times daily hot compresses using the method above can allow the cyst to drain. This is more successful if started as soon as the cyst is noticed.
  - If the cyst becomes recurrently inflamed, persists for more than 6 months, or is causing reduced vision (induced astigmatism from cysts in the upper lid), referral should be made.
  - If the cyst becomes infected and localised cellulitis occurs, a course of oral antibiotics such as co-amoxiclav may be necessary.

**Management of pre-septal cellulitis in primary care**

- Pre-septal cellulitis causes erythema, swelling and tenderness in the soft tissues of the orbit, anterior to the orbital septum. The severity of pre-septal cellulitis varies and the milder forms can be managed in primary care.

- Pre-septal cellulitis can result from infection via broken skin on the lids or from infected meibomian cysts. When the source of the infection is superficial and the eye can be easily visualised with normal eye movements and vision, systemically well and afebrile children can be treated with a course of oral antibiotic such as co-amoxiclav and daily review.
If there is no evidence of a superficial source of infection, the child has sinusitis or an upper respiratory tract infection (URTI) or is systemically unwell, the cellulitis is more likely to affect the orbit where it can cause optic neuropathy. Red flag symptoms include malaise, fever, double vision, reduction in vision and symptoms of URTI. Red flag signs include inability to visualise the eye, proptosis, limited eye movements and pyrexia. These patients need same day referral and admission for intravenous antibiotics and possible abscess drainage.

References
- http://cks.nice.org.uk/blepharitis
- http://cks.nice.org.uk/cellulitis-acute#!scenario

The Neonatal and Infant Physical Examination (NIPE) – what to look for at the 6-8 week check

Key Learning Points
- NIPE eye screening takes place within 72 hours of birth and at 6-8 weeks.
- Eye screening allows the early detection and management of:
  - congenital cataract (2 to 3 infants per 10,000)
  - congenital eye malformations 5/10,000 live births
  - retinoblastoma 1/200,000 births.
- Early detection of ocular abnormalities such as cataract is required to enable management within the critical period of neuro-plasticity (approximately 10-12 weeks of age).
Early diagnosis and treatment for retinoblastoma is vision-preserving and life-saving.

Surgical management after the critical period carries a poor visual prognosis.

Congenital cataracts can be unilateral or bilateral and vary in their severity. They can become more visually significant with time.

**History at the 6-8 week check**

- Any parental concerns regarding the baby’s eyes or visual development.
- Prematurity or neonatal conditions.
- Any risk factors for congenital eye disease.
  - Family history of congenital cataract (1st degree relatives).
  - Family history of retinoblastoma or other early-onset eye disorder.
  - Possible syndromes eg Down syndrome.
  - Possible exposure to intra-uterine infections such as cytomegalovirus or rubella.

**Performing the 6-8 week check**

- Examine the baby in a dimly lit room.
- Ensure the baby is settled on the carer’s lap; examining a baby when he/she is feeding is easiest.
- Use a direct ophthalmoscope with new batteries to give a bright light.
- If necessary open the lids gently with one hand.
- Look through the ophthalmoscope at a distance of about one third of a meter (it can be helpful to have the ophthalmoscope set on +3.00).
- Often a baby will open his/her eyes if held with his/her head on the parents shoulder.
- Note: any lid or orbital abnormalities, position and symmetry
  - the size and clarity of the cornea (the normal corneal diameter is approximately 11mm)
- the roundness and size of the pupil
- the brightness of the red reflex and any dark areas within it.

- Babies of Asian and Afro-Caribbean ethnicity have darker intra-ocular pigmentation and have a darker or more brown-yellow reflex than the pink reflection seen in Caucasians. This can make examinations particularly difficult.
- Look for the baby fixing and following your face or a torchlight and assess eye movements.

**Possible findings**
- Ankyoblepharon (skin bridges between the upper and lower lids).
- Microphthalmia – small eye(s).
- Anophthalmia – absent eye(s) with small palpebral fissures.
- Buphthalmia- large eye(s) often with hazy cornea(s) due to high eye pressure.
- Limbal dermoid – white lump at corneal limbus in one/both eyes.
- Iris coloboma – iris defect infero-nasally in one/both eyes causing vertically elongated pupil.
- Aniridia – large pupil with either no or a small iris stump.
- Cataract- lens opacity partially/completely blocking red reflex.
- Leukocoria – white reflex can be due to retinoblastoma or retinal coloboma.
- Nystagmus – to and fro movement of both eyes can be horizontal or vertical.
- Poor visual fixation but normal external eye exam and red reflex.
- Large angle squint or restricted eye movements.

**Outcome**
- No abnormality detected and no risk factors: transfer to Healthy Child Programme.
  - Advise parent to contact health care professional if there are future concerns about visual development, the baby’s eyes look unusual, a misalignment (squint) of the eyes is noticed or a photograph shows a lack of “red eye” in one
eye on a photograph.

- Risk factor identified: babies with a positive family history of congenital eye disease (congenital cataract or retinoblastoma in a 1st degree relative) or with a syndrome such as Down syndrome should be referred to the hospital eye service.
- Babies with an abnormal eye examination such as an absent or white reflex or nystagmus should be urgently referred to a paediatric ophthalmologist in the hospital eye service, where they should be seen before 11 weeks of age.

References
- http://www.nhs.uk/conditions/retinoblastoma/Pages/Introduction.aspx

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