How to test a child's eyes for strabismus

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Testing for squint in young children requires rapport with the child and attention to detail, plus a supply of interesting toys.

Prompt detection and treatment of strabismus (squint), a misalignment of the eyes, is essential for equal and full visual development in both eyes and to detect structural abnormalities or retinoblastomas. General practitioners play an important role in this early detection as they see children a number of times in their early years.

Checking a child for strabismus can be difficult and requires rapport with the child and attention to detail. Does the child see equally well with each eye? Does either eye move during cover–uncover testing? Are the corneal light reflexes symmetrical and the fundus red reflexes normal? Strabismus is often intermittent but is more obvious in a child who is sick, tired or teething.

Some practical hints

A few practical hints for testing young children for strabismus are described below.

- Small toys appropriate for his or her age will attract a child's attention and help establish rapport. The toy will stimulate accommodation and help uncover esotropia (inturning eye or convergent strabismus). My favourite toy is a pen torch inserted into a semitranslucent dragon with mobile arms – which looks 'gross'!
- The formal cover–uncover test is used to determine whether the eyes are fixating simultaneously – that is, whether the eyes are aligned. Movement in either eye to take up fixation is abnormal, provided there is steady fixation on a target.

Once you have established rapport, check that there is vision in both eyes. Make sure the child is looking at a detail on a toy or an appropriate visual target, such as an E, number or letter chart. With this steady fixation, cover one eye, uncover and repeat with the other eye. Observe whether the child prefers to use one eye, which suggests unequal vision, and any movement of either eye on the covering and uncovering.

Figure 1. An 18-month-old child with an asymmetrical red reflex. The left eye is fixing with a central light reflex while the right eye has a more lateral light reflex. The asymmetrical light reflex and different red reflex in one eye suggest misalignment. Right esotropia is the provisional diagnosis.

- Light reflexes are sometimes easier to assess than movement of the eye. Asymmetry of the corneal light reflexes and abnormal fundus red reflexes (the affected eye having a different reflex than its fellow) suggest misalignment

Figures 2a and b. a (left). When this 4-year-old boy was asked to read the letters on a letter chart, he assumed a right head turn. b (right). In a straight ahead position, he has an underlying right esotropia (as shown by the asymmetrical light reflex in his right eye).

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Figures 3a and b. a (left). This 3-year-old girl is fixing with her right eye (central light reflex). The light reflex is not central on the left inturning eye. There is also a tilt of the head to the left. The provisional diagnosis is left esotropia associated with left head tilt. There is a risk of left amblyopia. b (right). Check that the left sixth nerve is functioning by noting left eye abduction in left gaze.

Figure 5. This 10-year-old boy closes his left eye outside in the glare. When he is relaxed or tired the left eye drifts outwards. The right eye has a central light reflex. The light reflex on the left eye suggests a left exotropia.

of the eyes (Figure 1). Beware a yellow ('cat's eye') reflex which, until proved otherwise, may be a life-threatening retinoblastoma that requires a very urgent referral. Family photographs can show asymmetrical corneal light reflexes and abnormal red reflexes and are worth checking if possible.

- Head turning and head tilting to avoid a direction of gaze are further indicators of possible strabismus (Figure 2). Changes in head position may indicate overacting muscles, superior oblique palsy or sixth nerve paresis, among other diagnoses. Checking lateral gazes gives further information (Figures 3 and 4).
- One of the most difficult types of strabismus to detect in an apprehensive child in a windowless office is an exotropia (out-turning eye or divergent strabismus). The history of closing one eye outside in the glare is another clue to this diagnosis (Figure 5).
- The eyelids should also be observed when checking eye movements as their abnormal level (narrower or more open than expected) may be indicative of Duane's syndrome (Figure 6).

Figures 4a and b. a (left). This 5-year-old girl looks normal in right gaze. b (right). When she looks in left gaze, her right eye elevates. There is overaction of her right inferior oblique muscle. Check the history for head trauma with possible right superior oblique palsy (this may be bilateral but asymmetrical).

- Light reflexes should be checked carefully when there is a nasal epicanthus (wide nasal bridge). The nasal lids hide the sclera, giving a pseudoconvergent appearance even though the light reflexes may be symmetrical – pseudostrabismus (Figure 7).

Management

After testing a child suspected of having strabismus, a decision has to be made on his or her management. The choices for the general practitioner are:

- recheck the child at a later date
- refer the child to an ophthalmologist

continued



Figures 6a to c. This co-operative 4-year-old boy has an abnormal narrowing of his eyelids on attempted left gaze (c, right) compared with straight ahead (b, centre) or right gaze (a, left). The provisional diagnosis is complex strabismus – Duane's syndrome associated with astigmatism and amblyopia.

Figure 7. This 6-month-old boy has a wide nasal bridge with bilateral epicanthic folds. On light reflex, his eyes are aligned, but there is a slight pseudoconvergent appearance.

- regret – it is better to review to exclude retinoblastoma and ensure full visual development than to do nothing and regret it later.

Conclusion

Testing a child's eyes for strabismus requires the co-operation of the child, which can be achieved by stimulating his or her interest with toys. The cover–uncover test and testing of light reflexes and red reflexes are helpful. Family photographs can also give valuable information. Associated conditions that may be cause for concern should be considered – for example, preferring to use one eye rather than the other eye on monocular testing, abnormal head position and abnormal lid position. MT

Further reading

1. Dunlop C. Does your child's eye turn? Early detection of strabismus by the GP. Mod Med Aust 1998; 41(12): 28-32.
2. Gole GA. Examination techniques for detecting strabismus in children. Mod Med Aust 1995: 38(2): 144-145.
3. Pettinger DF. Ophthalmic tips and traps: practical advice for GPs. Medicine Today 2000; 1 (8): 69-78.