

Seeing red in young children:

the importance of the red reflex

THE RED REFLEX

The single most important piece of clinical information that a paediatric ophthalmologist requires is the presence or absence of a red reflex. An absent red reflex usually suggests sight-threatening pathology (cataract) and may mean life-threatening pathology (retinoblastoma). Referrals from general practice are semi-urgent and need assessment within the week. In children <2 years of age, referrals that do not mention the red reflex state make it difficult to assess the degree of urgency. Inevitably, this means that some children may have a worse outcome as a result of delayed diagnosis.

The opposite situation arises where a 6-week-old baby with 'pale' or 'absent' red reflexes (usually because of ethnic variation) is referred and seen within a week, only for the parents to be told that their child has 'normal' red reflexes. It is hardly surprising that parents express sentiments including bewilderment, anger, and great relief.

To a paediatric ophthalmologist, the importance of a red reflex in a child aged <2 years is similar to the importance of temperature measurement in an ill baby with a rash. Yet an ophthalmoscope is quicker and easier to use than a thermometer in a small child.

Below is a straightforward pathway for making a reliable assessment in all cases: the assumption is that the room can be darkened to at least a semi-dark state.

COMMON SCENARIOS

Unnecessary referrals for normal red reflexes

1. A baby born to black and minority ethnic (BME) parents is seen for a 6-week check. The red reflexes appear more yellowy white than orange. (They may be almost absent if the pupil is very small.)
2. A parent brings a photo of their child with one red reflex and one white reflex. They have read an article explaining that

eye tumours can be diagnosed this way. When you look at the red reflexes they are normal, but the photo clearly shows a white reflex (Figure 1).

GP action. Instil a drop of tropicamide 0.5% into both eyes and see two more patients while the parents sit in the waiting room with their baby. Re-examine the red reflex through a dilated pupil. In a BME baby, it is symmetrical and similar to the red reflexes of the parents. It is often more like the sun than orange, but the parents should have similar reflexes. In a dilated pupil, the white reflex seen by photographic flash picture of the optic disc is swamped by a normal orange retinal reflex. Hence the reflex should appear 'red' from all angles. This simple action averts an unnecessary referral.

Abnormal or absent red reflexes requiring urgent referral

1. A baby seen at 6 weeks of age has one red reflex and one absent reflex. No mention of abnormal reflexes has been made in the neonatal discharge.
2. A parent brings their child aged <2 years with a squint in the eye. They have noticed a 'glint' in the eye in certain lighting conditions. The eye is turning outwards slightly. You see an absent red reflex in the affected eye. (The parent may have noticed the difference on a flash photograph [Figure 2].)

GP action. Instil a drop of tropicamide 0.5% into both eyes and reassess the red reflexes through dilated pupils. If the red reflex is still absent then an urgent referral should be made to the local paediatric ophthalmologist. Occasionally, a white reflex is seen instead of a dark one. This kind of reflex is the hallmark of a retinoblastoma in the eye; and it is the light reflecting from the tumour's white surface that can be seen when light reflects from a certain angle (Figure 3).

Ayad Shafiq, MA, DCh, FRCOphth, MRCP(Paed), consultant ophthalmologist, Royal Victoria Infirmary, Newcastle upon Tyne.

Address for correspondence

A Shafiq, Royal Victoria Infirmary, Queen Victoria Road, Newcastle upon Tyne, Tyne and Wear NE1 4LP, UK.

E-mail: Ayad.Shafiq@nuth.nhs.uk

Submitted: 12 November 2014; final acceptance: 20 November 2014.

©British Journal of General Practice 2015; 65: 209-210.

DOI: 10.3399/bjgp15X684625

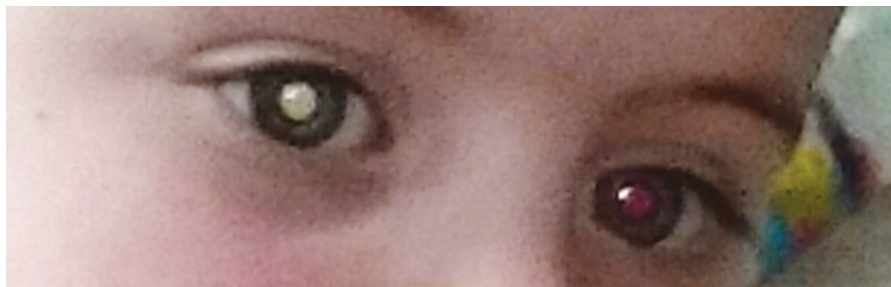


Figure 1. Photographic reflex of the right optic disc.

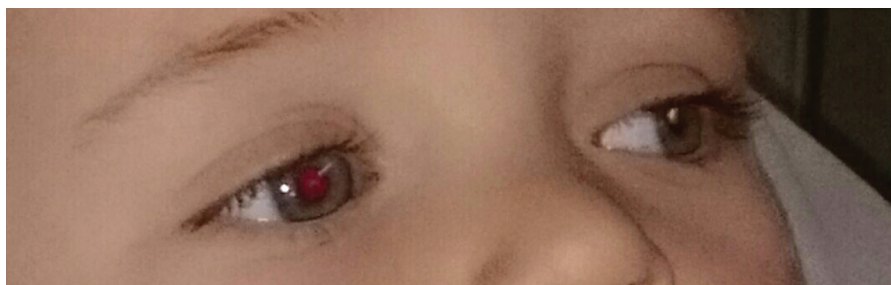


Figure 2. Absent red reflex in the left eye with a glint in the eye.



Figure 3. Left eye leukocoria (white pupil).

DILATING DROPS

In all these scenarios I have suggested the use of a dilating drop. GPs can be reluctant to dilate the pupils of babies based on two main misconceptions:

1. The drop has potential systemic side effects.

Response. Tropicamide 0.5% is recommended for use in babies as young as 31-weeks postmenstrual age by the Royal College Ophthalmologists' guidelines.¹ It is universally used and the experience of millions of dilated examinations every year suggests that it is entirely safe.²

2. Dilating an eye could cause acute glaucoma.

Response. Dilatation of the pupils in babies does not cause glaucoma. The eyes are structurally different to adult eyes.

Tropicamide

Minims® Tropicamide 0.5% come in handy small plastic containers with 20 in a box. One box could be used for 20 children. The 'use-by-date' is about 2 years. Each box costs less than £10.

CONCLUSION

In summary, any child aged <2 years needing any kind of eye examination should have a red reflex check. If there is doubt about the reflexes the pupils should be dilated. Dilating pupils is a cheap, safe, and effective way of being certain about the red reflex. Being able to describe the red reflex will ensure urgent referral.

Patient consent

The patients' parents have consented to the publication of the images in this article.

Provenance

Freely submitted; not externally peer reviewed.

Competing interests

The author has declared no competing interests.

Discuss this article

Contribute and read comments about this article: bjgp.org/letters

REFERENCES

1. Wilkinson AR, Haines L, Head K, Fielder AR. UK retinopathy of prematurity guideline. *Eye* 2009; **23**(11): 2137–2139; DOI:10.1038/eye.2008.128.
2. Bolt B, Benz B, Koerner F, Bossi E. A mydriatic eye-drop combination without systemic effects for premature infants: a prospective double-blind study. *J Pediatr Ophthalmol Strabismus* 1992; **29**(3): 157–162.