Practice Tips

Direct ophthalmoscopic examination of the eyes

Does a mydriatic agent help with diagnosis?

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Patients who present to the office with visual disturbances require a full eye examination to assess the nature of the problem. The direct ophthalmoscope is a useful, portable, inexpensive tool that allows examination of the optic nerve head and macula, magnified about 15 times. The ophthalmoscope was invented by Dr Hermann von Helmholtz in 1851[1] and has remained an essential component of ocular examinations.

While direct ophthalmoscopy is a relatively simple skill to master, many barriers can make it a challenge to perform on certain patients, such as those with cataracts or small pupils and those who cooperate poorly. Pupillary dilation has been shown to increase the ease and accuracy of direct ophthalmoscopic examination,[2] but there are concerns about the practicality and safety of dilating patients' pupils in the office.

Dilating patients' pupils

The dilating agent of choice for clinical examinations is tropicamide. It acts fast, achieving its effect in approximately 15 minutes and holding that effect for about 4 hours. Choosing a low concentration (0.25% to 0.5%) has been shown to minimize risk of adverse effects,[3] while still achieving adequate pupil dilation of >50%. The only negative effects experienced by patients are mild stinging upon instillation of the drop, mild photosensitivity, and an inability to focus on close objects. A 15-mL bottle of tropicamide (0.5%) costs $7.35 in Ontario. Use of a topical anesthetic (proparacaine 0.5%) helps relieve the stinging and increase absorption, but is not necessary. Pupils should be sufficiently dilated by 15 to 20 minutes; maximum effect is seen after 30 minutes.

Which patients?

The question is: Which patients should have their pupils dilated? The most suitable patients are those who have acute visual disturbances but no pain. This presentation suggests the problem arises from the retinal or optic nerve. A second question is: Which patients can safely have their pupils dilated? The vast majority of patients can have their pupils dilated virtually without risk (**Table 1**). Certainly anyone younger than 40 years who is emmetropic (does not require glasses) or myopic (is nearsighted and wears a "minus" lens correction) is a safe candidate, as is anyone of any age who has had cataract surgery. Patients whose pupils should not be dilated in a general practice office include infants and small children, hyperopic patients (farsighted and wear "plus" lens corrections), and patients who have had previous episodes of acute angle-closure glaucoma.

Table 1. Which patients can safely have their pupils dilated?

PATIENTS FOR WHOM DILATION IS SAFE
Anyone younger than 40 years who is emmetropic (does not require glasses) or myopic (is nearsighted and wears a "minus" lens correction)
Anyone of any age who has had cataract surgery
PATIENTS FOR WHOM DILATION IS UNSAFE
Infants and small children
Anyone who is hyperopic (is farsighted and wears a "plus" lens correction)
Anyone who has had previous episodes of acute angle-closure glaucoma

The most feared complication of dilating patients' pupils is precipitating acute angle-closure glaucoma. Two excellent studies have demonstrated, however, that this phenomenon is extremely rare. It occurred in only 2 of 7983 patients (0.03%) when 0.5% tropicamide was used.[4,5]

To determine whether a patient is at risk of angle-closure glaucoma, a quick and easy examination of the anterior segment with a penlight is all that is required. Hold the penlight at the lateral canthus and shine it toward the nose. As it passes through the anterior chamber of the eye, the iris plane on both sides of the pupil should be illuminated (**Figure 1**). If only the temporal iris plane is illuminated, the light has been blocked from reaching the nasal side of the anterior chamber. This could be due to a more anteriorly

Figure 1. Penlight examination of the anterior segment: *The iris plane on both sides of the pupil should be illuminated. If only the temporal iris plane is illuminated, the light has been blocked from reaching the nasal side of the anterior chamber. If this is the case, the eyes are predisposed to angle-closure glaucoma, and dilation should be avoided.*

positioned iris insertion, or more commonly due to a forward displacement of the iris structure due to crowding of the anterior segment (as occurs naturally when the mature lens pushes the iris forward with age). Such eyes are predisposed to angle-closure glaucoma, and dilation should be avoided.

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References

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We encourage readers to share some of their practice experience: the neat little tricks that solve difficult clinical situations. Tips can be sent by mail to the **Scientific Editor,** *Canadian Family Physician*, 2630 Skymark Ave, Mississauga, ON L4W 5A4; by fax 905 629-0893; or by e-mail **mabbott@cfpc.ca.**