

Mydriatics - The myths and realities

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Is it safe for you to dilate?

Historical background in the UK and the evidence of safe use

There is a very long record of safe use of diagnostic drugs by optometrists in the UK. The first examination in drugs for Fellows of the Worshipful Company of Spectacle Makers (SMC) was held at Liverpool in March 1938. In 1948, an examination in Ophthalmic Drugs was instituted by the British Optical Association (BOA) and was open to all opticians. Optometrists have been state regulated in the UK since 1958.

The use of drugs by optometrists in the UK (and all health care professionals) is governed by the Medicines Act 1968. A provision in this act allows optometrists (and dispensing opticians) to use and supply drugs during the course of their professional practice.

Neither dispensing opticians nor optometrists have at present any restriction on their use of diagnostic drugs.

The power is there for the General Optical Council (GOC) to make Rules but it has never been required to do so. Why ?

There is no evidence that the use of diagnostic drugs is an issue. This is reflected by the fact that there have never been disciplinary cases brought before either the Investigation Committee work or Fitness to Practise.

In contrast, there have been numerous cases of optometrists being brought before GOC disciplinary tribunals and before the court in civil litigation for **failing to dilate** the pupils when clinically indicated.

Norway?

Legislation: Forskrift om rekvirering og utlevering av legemidler fra apotek § 2-10”.

Training must have been completed. All optometrists educated after 2004 have automatically received the necessary training. A larger number of optometrists who registered prior to 2004 have also received the necessary competency, either by taking a masters degree or by completing a so-called GKD 2 course.

However, the drugs cannot be used in children under 5 years old... why is this?

Why use mydriatic diagnostic drugs?

- Ocular media and fundus examination
- Enhancing retinal photography
- Refraction through cataracts when pupils are small

Misinformation and misunderstanding

In some parts of the world, there are objections to optometrists using diagnostic drugs including mydriatics. Why? There are two areas to discuss.

Firstly, the argument that the drugs are “**dangerous**”. In some countries some ophthalmologists have raised spurious objections such as they are “**dangerous drugs**” and if used by optometrists will put the public in danger.



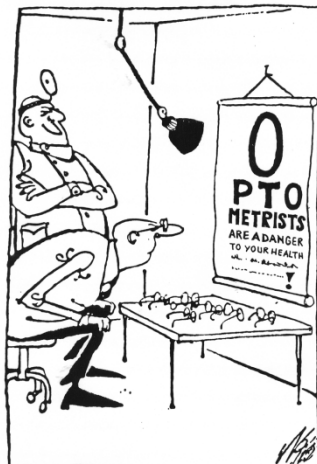
March 16th, 2003

B.C.P. Polak en H.J.M. Völker-Dieben

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Ophthalmologists lash out at optometrists



Optometrists are a danger to your health

Secondly, the spurious argument around **acute glaucoma**. This is an argument that comes from a misunderstanding associated with a perceived “risk of acute glaucoma” which is, in fact greatly exaggerated – the myth of significant dangers of acute glaucoma. .

Dangerous drugs ?

This ceases to be an argument as long as there is organised education, training & formal examinations all of which include an understanding of the use; precautions; dangers; and possible adverse side effects of the drugs. There should also be disciplinary governance of the profession.

Acute glaucoma? Fundoscopy: To dilate or not dilate?

The danger of inducing acute glaucoma is massively exaggerated because mydriatic induced glaucoma is rare.

If it happens, it would have happened anyway (e.g., in the cinema on vacation and midnight on a Sunday). Therefore, in one sense, if it happens, the optometrist may actually not be doing the patient a disservice (Bhan et al, 2006) although, one should usually not proceed with dilation if you feel there is a significant risk of inducing an attack.

In this regard, the author believes it is important that optometrists carry out a screening assessment for “at risk” patients e.g., van Herrick. This is such a swift test that this should be carried out on all adult patients at the same time that routine slit lamp microscopy is carried out. The results (e.g. AC grade 4) should be recorded in the patient’s notes.

So, how safe is mydriasis? In a study by Patel et al (1995), of the 4,870 subjects whose eyes were dilated on screening examination, none developed acute angle-closure glaucoma. It should be note however that 38 patients of the 1,770 who were referred for definitive eye examination were judged to have occludable angles on the basis of gonioscopic methods. The latter confirms that practitioners should at least check the angles

In the Rotterdam study of, routine use of mydriatic eye drops in all 6760 people participants aged 55 and over precipitated acute angle closure glaucoma in only two individuals (0.03%) (Wolfs et al, 1997).

In a systematic review of published research between 1933-1999, Pandit & Taylor (2000) reported that out of an estimated 600 000 individuals who received mydriatic eye drops, 33 (0.006%) developed acute angle closure glaucoma, giving an estimated risk of one in 20,000. They concluded that the risk of inducing acute glaucoma following mydriasis with tropicamide alone is close to zero, no case being identified. The risk with long-acting or combined agents is between 1 in 3,380 and 1 in 20,000. They concluded that mydriasis with tropicamide alone is safe even in people with chronic glaucoma. It should be advised in all patients when thorough retinal examination is indicated.

The subject of guidance on safety of routine dilation is important enough that an editorial of the British Medical Journal (Liew et al, 2006) reassures primary care practitioners. The authors state that pupil dilation is important for thorough fundoscopy, and the risk of precipitating acute angle closure glaucoma with routine use of mydriatics is close to zero.

This is compelling evidence that mydriasis with a drug such as tropicamide is safe. However, precautions should still be taken.

Precautions

Check anterior chamber angles.

It should be noted that although Patel et al (1995) found no mydriatic induced glaucoma in their study, they found that 38 patients of the 1,770 who were referred for definitive eye examination were judged to have occludable angles on the basis of gonioscopic methods.

Barnard et al (2012) carried out a retrospective study of optometric clinical records of 887 consecutive non selected patients. The prevalence of narrow angles (grade 1 van Herrick) was 9.4%. 26 patients (2.9%) were referred with angles which the author assessed put the patient at significant risk of future angle closure. 20 of these patients received treatment, 1 further patient was advised to receive treatment. This suggests that despite the arguments that mydriasis is safe, this does not negate the need to screen the anterior chamber angles prior to dilating and recording the findings.

Check IOPs

As well as recording IOPs before instilling a mydriatic, if the angles are narrow, check IOPs again after dilating. Note however that it can take time in some cases for a build up of pressure.

If angles narrow and you still need to dilate, for example a patient complaining of flashes & floaters then warn the patient of symptoms of an angle closure attack (pain, hazy vision, nausea) and what to do if this occurs (give them your mobile number; advise on attendance at A & E).

If the patient has obviously very narrow angles and you are convinced they will definitely close under mydriasis, you may wish to refer the patient complaining of flashes and floaters directly to an ophthalmologist. Sometimes prophylactic YAG iridotomies may be indicated prior to dilation.

Mydriatics

Mydriatic are needed to examine properly the ocular media and ocular fundi of certain types of patient. For example,

- as a general rule **always dilate** a patient complaining of flashes and/or floaters and examine with indirect ophthalmoscopy/microscopy
- where you are the only practitioner providing eye care to a diabetic patient
- routine funduscopy examination through a small pupil
- retinoscopy through an eye with a small pupil and cataract

Mydriatic Drugs

- Check anterior chamber angle (van Herrick) and IOP pre- and post- dilation
- But remember induced angle-closure is very rare (<1:100,000)
- A post mydriatic changes of >5mmHg may be significant

Tropicamide

Available as 0.5 or 1%. Use lower concentration used for lighter irides.

Mydriatic onset after 15 minutes with a duration of about 8 hours.

Phenylephrine 2.5%

Whilst 10% is available, this does not provide significant advantages over the 2.5% concentration and can cause systemic side effects which appear to be much rarer with the 2.5% concentration.

Mydriatic onset after 30minutes with a duration of about 12 hours.

A sympathomimetic drug such as phenylephrine acts upon the sphincter dilator and does not abolish light reflex. It is useful by itself to provide some dilation when there is a narrow angle as the effect can be more readily be reversed by bright light.

Accommodation is not adversely affected.

Phenylephrine 2.5% is very useful when used in combination with tropicamide 0.5% to obtain maximum possible dilation and thereby an optimum view of the ocular fundus. Diabetics dilate better with a combination of tropicamide and phenylephrine.

Whilst there is a theoretical risk of adverse side effects in patients with cardiovascular disease, aneurysms, vascular hypertension, arteriosclerosis and patients taking some ant-depressants or monoamine oxidase inhibitors, such side effects are rare particularly with 2.5%.

Examination of the anterior chamber

Both the depth and contents of the anterior chamber are relevant to assessment of the glaucoma patient and glaucoma suspect

Assessment of the anterior chamber angle

The anterior chamber angle of great importance in glaucoma patients

Main aim of clinicians is to determine if angle is open, closed, or has a high risk of closure

It's examination may also assist the diagnosis of a secondary glaucoma and reveal signs of other ocular diseases

The Van Herick method of angle width estimation

For those optometrists who do not yet carry out gonioscopy, this technique is a useful and commonly used non-gonioscopic technique of assessing the width of the anterior chamber angle. Whilst useful, it does not detect all forms of narrow angle and does not replace gonioscopy for a definitive assessment and grading. This topic is best dealt with in a separate lecture on assessing the anterior chamber.

The microscope is positioned straight ahead and the illumination system is set at 60° to the side. The patient is asked to look forward. A narrow slit beam is traversed from the sclera onto the cornea, stopping just past the limbus when an optical section of the cornea is first seen. At this point, the separation distance between the posterior corneal surface and iris is compared to the corneal width his observation can be made on both the temporal and nasal sides.

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Appendix

Drugs available to optometrists in Norway

Liste over øyedråper som kan rekvireres fra apotek av optikere som fyller kravene i nevnte forskrift fra 9. september 2004:

Atropin

- Atropin øyedråper 10 mg/ml «Ophtha»
- Atropin Minims øyedråper 10 mg/ml «Chauvin»

Cyklopentolat

- Cyclopentolat Minims øyedråper 10 mg/ml «Chauvin»

Homatropin

- Homatropin øyedråper 10 mg/ml «Ophtha»

Pilokarpin

- Isopto-Carpine øyedråper 20 mg/ml «Alcon»
- Pilo øyedråper 20 mg/ml «Novartis»
- Pilokarpin øyedråper 20 mg/ml «Ophtha»
- Pilokarpin Minims øyedråper 20 mg/ml «Chauvin»

Tropikamid

- Tropikamid Minims øyedråper, endosebeholdere 5 mg/ml (0,5%) «Chauvin»
- Mydrian øyedråper 0,5% «Novartis»

Lokalanestetika

Oksybuprokain

- Oxibuprokain Minims øyedråper 4 mg/ml «Chauvin»

Proksmetakain

- Alcaine øyedråper 5 mg/ml «Alcon»

Tetrakain

- Tetrakain Minims øyedråper 10 mg/ml «Chauvin»

Adrenalin-preparater som kan rekvireres fra apotek av optikere som fyller kravene i nevnte forskrift:

- EpiPen Jr injeksjonsvæske i autoinjektor 0.15mg/dose «ALK-Abello»
(til bruk på barn)
- EpiPen injeksjonsvæske i autoinjektor 0.3 mg/dose «ALK-Abello»
(til bruk på voksne)