

Ophthalmological Synopses

Mydriatics

The commonly used mydriatics comprise two groups of drugs:

(1) **Parasympatholytic**, which cause pupillary dilatation and paralysis of accommodation by rendering the sphincter pupillae and ciliary muscles insensitive to acetylcholine.

(2) **Sympathomimetic**, which imitate or potentiate the action of adrenaline and produce pupillary dilatation but no cycloplegia. These drugs potentiate the action of parasympatholytic drugs.

Most mydriatics reach their maximal effect by 30 to 60 minutes, although in children and people with deeply pigmented irides this may take longer.

Parasympatholytic drugs

(1) **ATROPINE** (0·5 to 2 per cent.) The most powerful cycloplegic available, producing mydriasis and cycloplegia lasting up to 2 weeks. It can be temporarily reversed by 1 : 100 intracameral acetylcholine.

Indications: (a) Treatment of anterior uveitis. (b) Refracting children under 5 years of age.

(2) **OXYPHENONIUM** (Antrenyl) (1 and 5 per cent.) Produces a powerful mydriasis lasting up to 4 days and cycloplegia lasting up to 12 days.

Indications: Useful substitute for atropine in sensitive patients.

(3) **HYOSCINE** (Scopolamine) (0·25 and 0·5 per cent.) Produces a powerful mydriasis and cycloplegia lasting up to 5 days.

Indications: Treatment of anterior uveitis in atropine-sensitive patients.

(4) **HOMATROPINE** (1 to 5 per cent.) Mydriasis lasts up to 2 days. It does not cause complete cycloplegia in children. Augmented by cocaine and reversed by eserine.

Indications: (a) Ophthalmoscopy. (b) Preoperatively for cataract extraction.

(5) **EUCATROPINE** (Euphthalmine) (5 and 10 per cent.) Effective mydriatic lasting only 4 hours producing little cycloplegia.

Indications: (a) Ophthalmoscopy. (b) Provocative test in suspected closed-angle glaucoma.

(6) **CYCLOPENTOLATE** (Mydrilate, Cyclogyl) (0·5 to 2 per cent.) Short-acting mydriatic and cycloplegic.

Indications: (a) Refraction. Maximal cycloplegia occurs within 45 minutes and persists for 30 minutes. Complete recovery occurs within 24 hours but can be reduced to 6 hours by 2 per cent. pilocarpine. (b) Ophthalmoscopy. Maximal mydriasis within 30 minutes. Particularly valuable in patients with heavily pigmented irides. (c) Preoperatively for cataract extraction.

(7) **TROPICAMIDE** (Mydriacyl) (1 and 2 per cent.) Rapidly-acting mydriatic and cycloplegic reaching its maximal activity in 20 minutes and lasting 6 hours.

Indications: (a) Refraction in adults. Maximal cycloplegia persists for only 20 minutes. (b) Ophthalmoscopy. (c) Preoperatively for cataract extraction.

(8) **LACHESINE** (E3) (1 and 2 per cent.) Weak mydriatic and cycloplegic lasting 6 hours.

Ocular side-effects

(1) Blurring of vision and inability to accommodate due to cycloplegia.

(2) Precipitation of closed-angle glaucoma in patients with narrow angles.

(3) Contact dermatitis in 5 per cent. of patients using atropine and less commonly with hyoscine.

Systemic side-effects

Atropine, hyoscine, and (rarely) homatropine may cause dryness and flushing of the skin, thirst and tachycardia, especially in infants. Delirium and confusion may also occur, particularly in the elderly. These effects are due to systemic absorption and can be prevented by pressing over the lacrimal sac or by tipping the head.

Sympathomimetic drugs

(1) **PHENYLEPHRINE** (Neo-synephrine) (10 per cent.) Produces mydriasis without cycloplegia within 20 minutes and lasts 3 hours. Particularly effective when combined with a parasympatholytic mydriatic.

Indications: (a) Ophthalmoscopy. (b) Breaking posterior synechiae. (c) Preventing iris cysts in patients using long-acting anticholinesterases (use 2.5 per cent.) (d) Preoperatively for cataract extraction.

(2) **EPHEDRINE** (5 per cent.) Produces mydriasis within 30 minutes, lasting 3 hours.

Indication: Ophthalmoscopy.

(3) **HYDROXYAMPHETAMINE** (Paredrine) (1 per cent.) Produces mydriasis within 40 minutes.

Indication: Ophthalmoscopy.

(4) **ADRENALINE** Very poor mydriatic when instilled into the normal eye, but a 1 : 1000 solution will dilate the pupil of a patient with Horner's syndrome.

Indications: (a) Simple glaucoma. 1 to 2 per cent. solutions decrease aqueous production and improve outflow. (b) Conjunctival decongestion. (c) Preventing iris cysts in patients using long-acting anticholinesterases (1 to 2 per cent.) (d) Diagnosis of Horner's syndrome. (e) Decreasing the absorption of local anaesthetics (1 : 50,000 or 1 : 100,000).

(5) **COCAINE** (2 to 4 per cent.) Produces mydriasis within 20 minutes lasting 2 hours together with a partial cycloplegia. Augments the action of homatropine.

Indications: (a) Ophthalmoscopy. (b) Preoperatively for cataract extraction. (c) Local anaesthetic.

Ocular side-effects

(1) Precipitation of closed-angle glaucoma in patients with narrow angles.

(2) Transient corneal oedema may occur with phenylephrine.

(3) Melanin deposits in the conjunctiva and cornea with adrenaline.

(4) Macular oedema is an uncommon side-effect of adrenaline therapy.

(5) Ocular pain and stinging.

(6) Desiccation of the corneal epithelium with cocaine.

Systemic side-effects

The adrenergic drugs may produce tachycardia and palpitations and should be used with caution in patients with hypertensive cardiovascular disease.

Cocaine may produce hyperreflexia, restlessness, delirium, tachycardia, irregular respiration, chills and fever, the result of central nervous system stimulation which may terminate in convulsions. These side-effects may be counteracted by a short-acting barbiturate.

Compound

MYDRICAINE is a solution of atropine, procaine, and adrenaline, which when injected subconjunctivally produces mydriasis within a minute.

Indication: When a very powerful mydriatic is required.

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