

Newer Anti-glaucoma Drugs

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The glaucomas are a family of diseases characterized by progressive optic neuropathy and associated field loss.

40% of the ganglion cells may be lost before the earliest functional damage can be determined.

Since surgery is associated with complications and needs surgical man power, effective medical treatment remains a valid option.

Target I.O.P

Definition:

The mean IOP obtained with treatment that prevents further glaucomatous damage.

Target I.O.P. - The mean I.O.P. obtained with treatment that prevents further glaucomatous damage.

T.I.O.P is difficult to assess in advance... However, aiming to achieve at least a 30% reduction from the pressure at which damage occurred is a useful arbitrary way.

Goal of medication - The amount of medication which achieves desired result with minimal side effects should be the goal of therapy.

Topical treatment should be started in one eye at a time. The differential IOP will give a better idea of effect.

Categories of medication:

(1) Adrenergic agonists

(2) Adrenergic antagonists: Beta-blockers

(3) Carbonic anhydrase inhibitors (CAIs) (a) Systemic (b) Topical

(4) Parasympathomimetics

(5) Prostaglandins and hypotensive lipids

(6) Combined drugs preparations

Adrenergic antagonists (Beta-blockers)

Action: Reduce aqueous humor formation, thus reduce IOP. Selective beta-1 blockers are said to be neuroprotective as well.

Selective Beta-1 blocker - Betaxolol 0.5% (Betoptic, Glaucoptic, Iobet)

Non-selective - Levobunolol 0.25%, 0.5% (Betagan), Timolol 0.25%, 0.5% (Optipres, Timolol-G, Glaucon, Lotim), Carteolol 1% (Ocupres).

Caution in drug selection: In the elderly, it is important that we do not inadvertently facilitate cardiac or pulmonary disturbances.

Contraindications: Non-selective: Asthma, pulmonary disease, sinus bradycardia (<60 beats/mm), or cardiac failure

Beta-1 selective: As above but has no cardiac involvement

Side-effects: Cardio pulmonary, occasionally Epithelial keratopathy beta-1 selective: Better tolerated in patients sensitive to non-selective agents.

Pregnancy and nursing mothers, infants and children safety is not proved.

Adrenergic Agonists

Non-selective: Dipivefrin 0.1% (Propine) - reduces aqueous formation and increases outflow.

Alpha-2 selective: Apraclonidine 0.5%, 1% (Lopidine) and Brimonidine 0.2% (Alphagan). Apraclonidine reduces aqueous formation, Brimonidine in addition increases outflow.

Propine - Alphagan - Useful as adjunctive or as mono therapy..

Caution - In occludable angle a patent iridotomy needed. Use in children and infants & lactating mothers not known.

Brimonidine 0.2% b.d. is highly effective as mono and adjunctive therapy for ocular hypertension and glaucoma. Provides sustained IOP lowering effect comparable to that of timolol. Alphagan combined with pilocarpin and Beta blockers. It is claimed by Allergan that Alphagan alpha-2 adrenergic agonist has neuroprotective property. Conclusive clinical reports are yet to come. Brimonidine inhibits ischemia-induced apoptosis in retina (animal experiment)

Carbonic anhydrase inhibitors (CAI's)

Topical - Dorzolamide 2% (Trusopt) BD or TDS

Systemic - Acetazolamide 250, 500 mg (Diamox, Avva, Actamide) 2-4 tablets in divided doses.