

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





Glaucoma Medical Therapy

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Key considerations in the medical management of open-angle glaucoma.

Ensure effectiveness of IOP control & Verify tolerability

Always consider ease of compliance

Periodically verify end points: quality of life, visual field, optic disc and IOP

Do not allow repeated drug changes to delay surgical intervention

Natural History of Intraocular Pressure During Pregnancy.

- Metabolic and physiologic changes during pregnancy cause a mild decrease in the (IOP) **1.5mmHg**
- occur by several mechanisms.
 - The episcleral venous pressure decreases due to changes in the mother's hemodynamics.
 - A metabolic acidosis occurs, which affects aqueous production and decreases IOP.

Intraocular Pressure During Pregnancy.

- In one study, the majority of eyes required treatment with glaucoma medications and maintained stable visual fields.
- However, the course of glaucoma was variable, with
- 18% developing visual field loss and another 18% developing increased IOP without visual field loss.

FDA Safety Categories

- Class A drugs have an established safety record, with human testing data proving safety.
- Class B drugs have animal safety data but no human data to confirm.
- Class C drugs have either animal studies with adverse effects or no human or animal data.
- Class D drugs have clear risks, although use can be justified under certain conditions.
- Class X drugs are known to cause birth defects and should never be used during pregnancy. FDA

FDA Safety Categories

Drug Class	Pregnancy Category
Prostaglandin analogs	Class C
Beta blockers	Class C
Alpha-adrenergic agonists	
Brimonidine	Class B
Apraclonidine	Class C
Carbonate anhydrase inhibitors	Class C
Nonspecific adrenergic agonist ^a	Class B
Fixed-combination timolol-dorzolamide	Class C
Cholinergic drugs	Class C

Glaucoma medications may harm the foetus and neonate

- Human data on adverse effects of glaucoma medications during pregnancy and lactation are sparse because the coincidence of glaucoma and pregnancy is uncommon.
- Timolol can reportedly cause foetal **bradycardia** and cardiac arrhythmia¹.
- Timolol and betaxolol were found to be concentrated in **breast milk**.

Glaucoma medications may harm the foetus and neonate

- Prostaglandin analogues. These drugs are derivatives of **PGF₂α**, an endogenous prostaglandin with potent contractile effects on the myometrium, known to play a central role in the initiation of labour.
- Although the short blood **half life** of prostaglandin analogues reduces the risk of preterm birth after topical application, the drugs should not be used in pregnancy.

Glaucoma medications may harm the foetus and neonate

- Because not all risks are known, the safest pregnancy-related pharmacy is as little pharmacy as possible.
- Punctal occlusion & lid closure not only –systemic absorption but also ++bioavailability
- If the rate of glaucoma progression is low, medications can temporarily be discontinued.

Glaucoma medications may harm the foetus and neonate

- Women of childbearing age may however have severe glaucoma requiring therapy.
- Laser trabeculoplasty (**LT**) is safe and can thus be considered, but the efficacy of LT is often low in these young patients.
- **Filtering procedures** without the use of antimetabolites can be an alternative.

GLAUCOMA MEDICAL THERAPY IN PEDIATRIC PATIENTS

- Management of paediatric glaucoma is essentially surgical
- Medical therapy is used temporarily
- Few cases may respond to topical drops or as an adjunctive after surgery
- Use the **minimum** medical regimen that will result in acceptable IOP control.

GLAUCOMA MEDICAL THERAPY IN PEDIATRIC PATIENTS

- Children are more vulnerable to side effects, due to reduced body **mass** and blood **volume** for drug distribution (resulting in higher concentrations from the same absorbed dose).
- They may be unable to **verbally** describe side effects caused by medications. Thus, children on chronic medical therapy need to be carefully monitored.

Namenda (memantine).

- FDA clinical trials, Namenda (memantine) as a means of protecting the optic nerve from glaucoma damage.
- Namenda originally was FDA-approved in 2003 for its neuroprotective effects in the treatment of Alzheimer's.

Namenda has been shown to prevent shrinkage or atrophy of visual nerve cells in the presence of glaucoma. If approved,

- would be prescribed along with conventional treatments to help prevent optic nerve damage and vision loss.
- Namenda is an oral systemic medication.

Copaxone (glatiramer acetate).

- Copaxone is an injectable drug currently used to treat patients with multiple sclerosis.
- is being investigated as a possible neuroprotective agent to prevent damage to the optic nerve from the effects of glaucoma.
- Copaxone appears to protect the optic nerve from the direct toxic effects on nerve cells caused by increased IOP.

Gingko biloba.

- Some study results indicate that the herb ginkgo biloba might offer some protective effect for the optic nerve, which can be damaged by glaucoma.
- A small study reported in the February 2003 issue of *Ophthalmology* demonstrated that some individuals improved their ability to see a wider visual field following treatment with ginkgo biloba.

Latanoprost Punctal Plug Delivery System.

- Now undergoing FDA clinical trials, this drug delivery system by QLT Inc. involves inserting a tiny **punctal plug** into a drainage channel in the eye. During a 12-week period, the drug slowly is released to control high intraocular pressure associated with glaucoma.
- Early investigations show the system works.
- This drug delivery method addresses problems with compliance among people who must use eye drops daily.

Nanoparticles

- University of Central Florida researchers have reported promising results from experiments using laboratory-created nanoparticles to deliver a compound able to block enzymes that create carbon dioxide, which contributes to the buildup of internal eye pressure associated with glaucoma. Investigations into this approach to treating glaucoma are in very early stages.

Practice

- In practice, each patient must be assessed individually in order to select the most appropriate therapy.
- Both the action and side effect profile of the drug need to be considered, as well as the indications or contraindications in the individual patient.
- The ophthalmologist should be familiar with the actions, interactions and side effects of the individual
- **Do not allow repeated drug changes to delay surgical intervention**

Thank You