Glaucoma: One Drop, Two Drop, or More 2hr

What's New in Glaucoma 1hr

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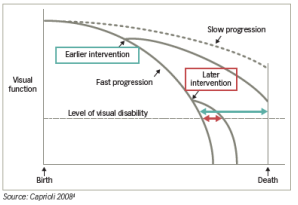
No financial disclosures

Goals for Glaucoma

- Now: more complicated. You want to preserve as much visual function as possible

Figure 1: Effect of time of intervention on the rate of glaucoma progression



Source: Caprioli 2008[9]

Stages of glaucoma

	Mild	Moderate	Severe
AAO[31]	Optic disc cupping but no visual field loss	Glaucomatous neuropathy with visual field loss not within 5° of fixation	Visual field loss in both hemispheres or within 5° of fixation
Canadian guidelines[26]	C: D ratio <0.65 or mild visual field defect not within 10° of fixation	C: D ratio 0.7-0.85 or visual field defect not within 10° of fixation or both	C: D ratio >0.9 or visual field defect within 10° of fixation or both
International Classification of Diseases 10	Optic nerve abnormalities consistent with glaucoma + normal fields	Optic nerve abnormalities consistent with glaucoma + one hemifield abnormality, not within 5°	Optic nerve abnormalities consistent with glaucoma + both hemifield abnormality or within 5°

AAO: American Academy of Ophthalmology

Step One: Finding Out Who to Treat

Who do I treat 100% of times

- Anyone with consistent, reliable, repeatable and/or progressive changes in ONH, rNFL, or VF

Who do I treat 100% of times

- Anyone with an IOP of 28 or greater

Who do I treat 100% of times

- Anyone with C/D .80 or above

Who do I treat 100% of times

- Anyone who wants to be treated to decrease their risk of converting from glaucoma suspect to glaucoma

Prevention of glaucoma

- Eating green leafy vegetables (spinach, kale) and bright colored vegetables have been shown to a mild effect on delaying or preventing glaucoma
- These work much better than vitamins with the same antioxidants

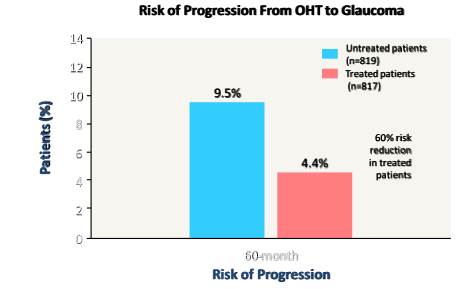
Prevention of glaucoma

- Avoid head down positions
- Avoid sleeping on your stomach
- Add 1-2 pillows and sleep on your back

Prevention of glaucoma

- What about lowering IOP through medical therapy (aka can we prophylactically treat glaucoma?

Benefit of Treating OHT



OHT = ocular hypertension.
Kass MA et al. *Arch Ophthalmol.* 2002;120:701-713.

Options – in Order of Use

- Eyedrops
- Laser surgery
- Conventional Surgery

Glaucoma Medications

Meds work for 90% of patients

Factors To Consider When Setting Target IOP

- **Highest IOP**
- **Severity of Glaucoma**
- **Patient's age**
- **Corneal thickness**
- **Race**
- **Family history**

"Targets"

- 25% IOP reduction for OHTN or mild glaucoma
- 30% for moderate glaucoma
- 35% or more for severe glaucoma

Common Mistake

- Patient is at or below target IOP and you mistakenly assume that the glaucoma is under control

Glaucoma Meds

- Beta Blockers
- Alpha-adrenergics (Alphagan)
- Topical CAI
- Prostaglandin - XLT
- Nitric Oxide + PG (Vyzulta)
- Rho kinase Inhibitors
- Cholinergics (Pilocarpine)

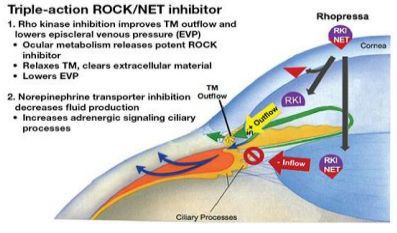
Vyzulta

- Lowered IOP by 35% to 44%, compared with only 26 to 27% with latanoprost alone
- No additional side effects compared to a PG alone; no systemic side effects

Problem with Vyzulta

- $$$$$$$$
- Try vyzulta.com - pay no more than $35 or $40
- Insurance coverage is finally starting to get better

Rhopressa



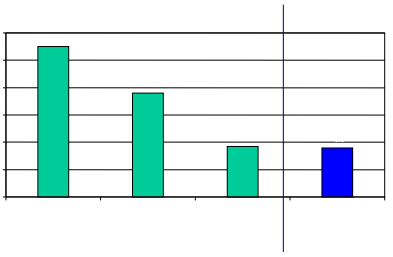
Problem with Rhopressa

- $$$$
- Hyperemia
- Use discount cards
- Insurance coverage is finally starting to get better

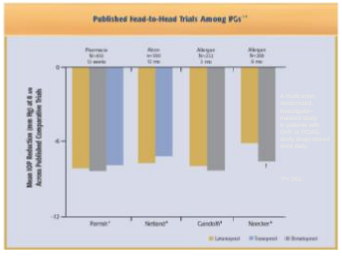
PG: Efficacy

- Topical Beta blockers: 20% IOP reduction
- Prostaglandins: 25-28% IOP reduction

Prostaglandins: Excellent Flattening of IOP Diurnal Variation



IOP Reduction in Head-to-Head Trials of PG Analogs



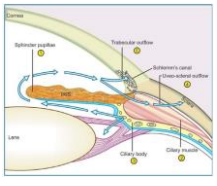
[1]Parrish RK et al. *Am J Ophthalmol.* 2003;135:688-703. [2]Netland PA et al. *Am J Ophthalmol.* 2001;132:472-484. [3]Gandolfi S et al. *Advances in Therapy.* 2001;18:110-121. [4]Noecker RS et al. *Am J Ophthalmol.* 2003;135:55-63.

Prostaglandins

- Can cause CME in aphakic patients

Beta Blockers MOA

- Timolol
- Levobunolol
- Carteolol



Contraindications to Beta-Blockers

- Congestive Heart Failure
- COPD
- Asthma
- Emphysema

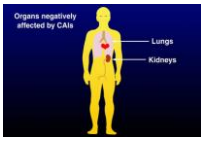
- Athletes: Does not allow for heart rate to exceed 135 BPM

Beta Blockers: Advantage

- Easy to follow schedule
- Generic beta blockers are relatively inexpensive
- Can generally get 1.5 to 2.0 mm hg additional IOP lowering when added to PG

Carbonic anhydrase inhibitors

- **Contraindications**
  - **–Sulfa allergies**
  - – Sickle Cell disease
  - – Hypokalemia
  - – Renal disease
  - – Liver disease



CAIs

15-20% IOP lowering

Mostly used as 2nd line

Mostly used BID

Alpha-adrenergic agonists: Brimonidine

- Enhances uveoscleral outflow
- Suppresses aqueous humor production

Brimonidine

- Side Effects: dry mouth, fatigue, drowsiness, and headaches
- Side Effects: Avoided in children because of possible CNS involvement

Brimondine

- FDA approved for TID dosing
- Most prescribe as BID dosing
- Can get additional 2.5 mg Hg IOP lowering when added to PG

Chief advantage of combinations

Improved compliance

Combination Products: Disadvantage

- **All glaucoma medications have a non-response rate of roughly 10% so there is a 20% chance that one of the components of any combination drug is not doing anything**
- **Mismatching of doses – for example Cosopt**

Oral Glaucoma Meds

- Diamox
- Neptazane

Diamox

- Oral CAI (Acetazolamide)
- Used to manage glaucoma and also to manage altitude sickness
- Available in 250 mg tablet and 500 mg Sequels

Diamox

- Typical dosing either anywhere from 500 mg to 1g per day
- Efficacy: Lowers IOP 40-50% !!!!
- **Available in injectable form**

Neptazane

- Methazolamide
- Same indications as Diamox
- 25 or 50 mg BID
- Similar efficacy as Diamox

Current Use

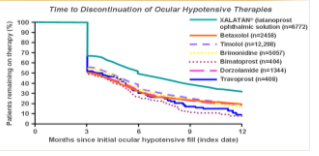
- Small percentage of clinicians use them for LT glaucoma care
- Most use for post-op cataract surgery IOP spikes or for acute ACG

Marijuana

- Must be smoked
- Lowers IOP by 20-25%
- Only lasts 4-6 hours

What are the weakest links when managing patients with glaucoma?

Compliance



Reasons for NonCompliance

- **Forgetfulness**
- **Cost**
- **Complexity**
- **Side effects**
- **Lack of education**
- **Difficult schedule**
- **Other disease states**
- **Patient's motor skills**

How are patients non complaint?

Most common: miss ocassional dose and/or appointment

Don't take drops for weeks or months at a time

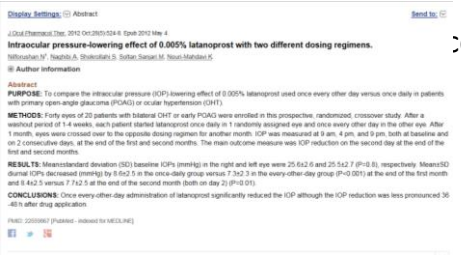
Don't take eyedrops at all

How big of a role does noncompliance play in glaucoma?

No role

Some role, but not the chief reason why patients progress

Is the main reason why patients progress



Intraocular pressure-lowering effect of 0.005% latanoprost with two different dosing regimens.

Nilforushan N, Naghibi A, Sholeslahi S, Soltan Sanjari M, Nouri-Mahdavi K

Author information

Abstract

PURPOSE: To compare the intraocular pressure (IOP)-lowering effect of 0.005% latanoprost used once every other day versus once daily in patients with primary open-angle glaucoma (POAG) or ocular hypertension (OHT).

METHODS: Forty eyes of 20 patients with bilateral OHT or early POAG were enrolled in this prospective, randomized, crossover study. After a washout period of 1-4 weeks, each patient started latanoprost once daily in 1 randomly assigned eye and once every other day in the other eye. After 1 month, eyes were crossed over to the opposite dosing regimen for another month. IOP was measured at 9 am, 4 pm, and 9 pm, both at baseline and on 2 consecutive days, at the end of the first and second months. The main outcome measure was IOP reduction on the second day at the end of the first and second months.

RESULTS: Mean±standard deviation (SD) baseline IOPs (mmHg) in the right and left eye were 25.6±2.6 and 25.5±2.7 (P=0.8), respectively. Mean±SD diurnal IOPs decreased (mmHg) by 8.6±2.5 in the once-daily group versus 7.3±2.3 in the every-other-day group (P<0.001) at the end of the first month and 8.4±2.5 versus 7.7±2.5 at the end of the second month (both on day 2) (P=0.01).

CONCLUSIONS: Once every-other-day administration of latanoprost significantly reduced the IOP although the IOP reduction was less pronounced 36-48 h after drug application.

PMID: 22659967 [PubMed - indexed for MEDLINE]

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What can you do to help increase patient compliance?

Control Costs

Class	Brand Name	Generic Available
Alpha 2 Agonist	Alphagan P	Yes
Beta Blocker	Timoptic	Yes
Carbonic Anhydrase Inhibitor	Trusopt	Yes
Prostaglandin	Xalatan/Travatan/ Lumigan	Yes
Combination	Cosopt	Yes
Combination	Combigan	No

Limit the # of bottles

- **Optimal Therapy different from Maximal Therapy**
- **Two bottle limit**
  - **Addition of third bottle rarely provides substantial IOP reduction**

Check the Schedule

Frequency of Dosing	Compliance with Dosing	Compliance with Timing
QD	79%	74%
BID	69%	58%
TID	65%	46%
QID	51%	40%

Talk to Your Patients

Discuss surgical intervention

Scare them

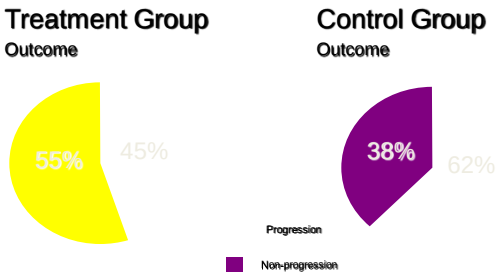
What if patients still don't listen…

- Tell them they will no longer be a patient in my office after 30 days.
- In that 30 days, they can seek any emergency appointments if needed
- Gave them a list of other providers in the area
- Told them they need to follow up on the glaucoma so they don't go BLIND.

Next weakest link

Early Manifest Glaucoma Trial

- 255 patients with glaucomatous visual field loss
- Randomized into treatment or observation group
  - **Examination every 3 months**
  - **Stereo ONH photos every 6 months**
  - **30-2 Full Threshold VF every 3 months**
  - **Follow-up for at least 4 years**



Why Do People Get Worse:

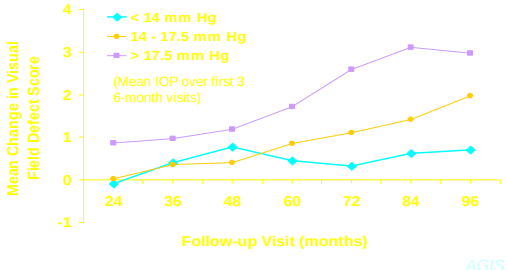
We Only Know So Much

How many people get worse with glaucoma?

Advanced Glaucoma Intervention Study

- A total of 789 eyes with advanced glaucoma
- To assess the long-range outcomes of interventions involving trabeculectomy and argon laser trabeculoplasty

Vision Loss and IOP



AGIS, 2000

For most patients with glaucoma . . .

The question is not IF they will get worse

The question is WHEN they will get worse

Current Model for Therapy

- **Based upon principle of detecting damage**
- **Set Target IOP and follow patient for progression**

Current Model for Therapy

- **Limitations**
  - **Changes are irreversible and represent significant damage to optic nerve**
  - **With our current model, we are always playing catch up**

When does a glaucoma patient need surgery?

A truly noncompliant patient

The disease is progressing, regardless of IOP

How do you know if a patient's glaucoma is progressing?

- IOP not controlled any more
- ONH getting worse
- Progression on OCT or VF

How many medications is your patient on before you send them for surgery?

Selective Laser Trabeculoplasty

- **Uses a "cold" laser**

- No thermal damage to tissues

LIGHT (Lasers in Glaucoma and Ocular Hypertension) Study

- Found patients offered SLT as 1st choice had fewer side effects from glaucoma
- Glaucoma was controlled just as well if not better than eye drops

How many patients respond to SLT treatment?

75%

Next Problem with SLT

By 5 years, more than 50% need additional therapy

Biggest Problem with SLT

Success is defined as 20% IOP reduction which is inadequate

Glaucoma Surgery options

- Trabeculectomy
- MIGS
- Tube shunts and microstents
- Cyclodestruction

Conventional Surgery Options

Trabeculectomy

Conventional Surgery Options

Conventional Surgery Options

Tube Shunts

Conventional Surgery Options

Cyclodestructive Procedures

Billing Codes for Glaucoma

- CEX 92004/92014
- Gonioscopy 92020
- Corneal pachymetry 76514
- Visual field analysis 92083
- OCT testing 92133
- Fundus photography 92250
- Serial tonometry 92100

How much is treating glaucoma worth to your practice?

Average glaucoma & suspect patient

- Worth over $400 a year to your practice
- Does not count refraction, CL exam fees, eyeglasses, or contact lenses
- You can keep these patients or build someone else's practice