Clinical Decision Making in Glaucoma

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Clinical Decisions

- Diagnosing and managing Ocular Hypertension and Glaucoma requires a series of decisions be made over the course of the lifetime of care
  - Is disease present?
  - What tests should be performed to aid in establishing diagnosis?
  - If disease is present, what type?
  - OHTN vs. Glaucoma
  - Is therapy required?
  - What therapy?
  - If glaucoma, what type?
    - Primary vs. secondary
    - Open vs. chronic angle closure
  - Grade severity of condition
  - Establish the target IOP
  - When should patient return?

What is Risk Assessment?

- 1961- Framingham Heart Study gave medicine the term “risk factor”
- Identification of risk factors for coronary artery disease

Global Risk Assessment and Cardiology

- Risk assessment and prevention have contributed to the reduction in cardiovascular mortality

How Can This Strategy Be Applied to Glaucoma?

- Identify patients at moderate to high risk of converting from ocular hypertension to glaucoma
- Direct therapy at those who are at greatest risk
- Which risk factors should be considered?
Risk Assessment

- Consider number of risks individual has that puts them at risk for
  - conversion of ocular hypertension to the development of glaucomatous damage OR
  - from early glaucomatous damage to blindness
- Based on evidence
- Studies include Ocular Hypertension Treatment Study
- What risk is too much and therapy is indicated prophylactically?
- Uses concept from Framingham Heart Study and Cardiovascular disease

Risk Assessment

- In cardiovascular disease, evaluate risk factors for conversion of hypertension to known outcome such as MI or CVA
  - Risks include hypertension, obesity, elevated cholesterol, smoking, family history, sedentary lifestyle
- Use similar risk factor assessment for the development of glaucoma
  - Outcome measure is not as obvious
    - When is glaucoma present?
    - Optic nerve damage only vs. nerve and field loss

Risk Assessment

- At what risk is therapy indicated to prevent undesirable outcome from occurring
- For glaucoma approximately 15% is consensus
- If cardiovascular disease, risk is approx 5%

Risk Assessment

OHTN to Glaucoma
Steve Mansberger, MD
Discoveries in Sight Portland, OR

Risk Assessment

- Age
- IOP
- Corneal Thickness
- Vertical Cup/Disc Ratio
  - Optic Nerve healthy
- PSD Visual Field
  - Global Indice
  - Field full
- Diabetes Status
Risk Assessment

- Risk Level Low < 5%
  - Monitor
- Risk Level Moderate 5-15%
  - Consider Therapy Discuss with patient
- Risk Level High >15%
  - Treat

Table 1
Six Important Questions in Managing OHTN or POAG

- What is the risk to our patient’s visual function if condition is not treated?
- If we accept that OHTN and glaucoma has a natural history with a likely outcome that our patient and ourselves are not willing to risk, how early and aggressively must we treat to alter natural history and preserve vision?
Six Important Questions in Managing OHTN or POAG
- What are the downsides to treatment?
- Which treatment is best?
- How are the results of the treatment best measured?
- What risk factors help most in making the best management decisions?

Five Rules for Assessment of the Optic Disc in Glaucoma
1. Observe the scleral ring to identify the limits of the optic disc and its size
2. Identify the size of the rim
3. Examine the retinal nerve fiber layer
4. Examine the region of parapapillary atrophy
5. Look for retinal and optic disc hemorrhages

Initial Medical Management of OAG
- Before starting therapy
  - obtain several IOP readings
    - either done on one day (diurnal curve) or over 2-3 days at different times
  - need detailed pretreatment information
    - medical and ocular
  - grade severity of glaucoma
    - based upon nerve appearance, fields and highest IOP

Describe and Understand Condition
- Open vs. Narrow Angle
  - Chronic angle closure glaucoma resembles open angle forms
    - detect with gonioscopy
    - Asians
- Primary vs. Secondary forms
  - detect with slit lamp evaluation
  - secondary glaucomas

Clinical Correlations in Glaucoma
- Compare the visual field and optic nerve appearance
- Does the disc and visual field correlate?
- Does the comparison between the right and left eyes fit?

Initial Medical Management of OAG
- Ask “How will optic nerve and visual field appear in twenty years”
  - not in 3 months
  - Hattenhauer
- Lower target IOPs
  - AGIS data
  - Sustained IOP reduction
Clinical Decisions in Glaucoma

- Target pressure
- Select therapy vs. No therapy
  - Medications
    - Prostaglandins- most common first line agent
    - Beta blockers
    - CAI
    - Adrenergic
    - Laser Trabeculoplasty
    - Filter Surgery

Select the Primary Medication
Open Angle Glaucoma

- Base the decision on:
  - Stage of disease
  - driver for choosing initial therapy
  - Baseline IOPs
  - General health of patient
  - Insurance coverage
  - Systemic medications
    - consider Brimonidine or Latanoprost if on systemic β-blocker

Select Target Pressure

- Think in terms of Per Cent Reduction from highest IOP reading
- Greater the damage, lower the IOP needs to be

Setting Target Pressures

- Consider the following:
  - How bad is the glaucoma?
  - How long did it take to get that bad?
    - get from old records if possible
  - What is the life expectancy of the patient?
  - Trend is for lower target IOPs
    - sustained reduction

Target IOP Based Upon Initial Optic Nerve Damage and Highest IOP

<table>
<thead>
<tr>
<th></th>
<th>20 mm Hg</th>
<th>30 mm Hg</th>
<th>40 mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>25%</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>Moderate</td>
<td>35%</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>Severe</td>
<td>45%</td>
<td>50%</td>
<td>60%</td>
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Target IOP Based Upon Initial Visual Field Loss and Highest IOP

<table>
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Target Pressures

- Setting the target IOP, consider highest IOP
  - IOP in 40 with some cupping, asymmetry and early field loss
  - IOP in low 20s may work
  - Same amount of damage but presenting IOP of 20
  - need to be more aggressive

Modifying the Medical Regimen

- Lack of Control
  - IOP too high
    - Reverse Monocular Trial
  - IOP Variability
  - Optic Nerve Progression
  - Visual Field Loss
  - Adding a medication
    - medications vs. laser vs. filter surgery
    - add medication vs. increase dosage or concentration

Risk Factors for the Progression of Glaucoma

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<tbody>
<tr>
<td>Older age1-3</td>
</tr>
<tr>
<td>Higher IOP (baseline)2</td>
</tr>
<tr>
<td>Higher IOP (over follow-up)2</td>
</tr>
<tr>
<td>IOP fluctuation4</td>
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<tr>
<td>VF status at baseline2</td>
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<tr>
<td>Race (nonwhite)1-3,5</td>
</tr>
<tr>
<td>Disc hemorrhage2,5</td>
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<tr>
<td>Pseudoexfoliation2</td>
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When do you Add or Switch a Medication

- Beware of “Regression to Mean”
- Tendency is to do nothing or add medications
  - tolerance develops to some medications
    - Beta Blockers, Alpha Agonists
  - Is the angle getting narrow?
    - Perform gonioscopy

Monitoring IOP to Adjust Therapy

- Repeated measurements essential to assess patient response
- IOP fluctuates around the mean with or without switching

Hypotensive Efficacy

- Adding to β–adrenergic Blockers
  - Prostaglandins
  - Miotics
  - Carbonic anhydrase inhibitors (PO)
  - α2–adrenergic agonists
  - Dorzolamide
  - Dipivefrin=epinephrine
Managing Glaucoma

- First medication
  - Prostaglandin

- Second medication
  - Topical CAI or Beta Blocker
  - Or switch to different prostaglandin

- Third medication or Modality - Try to not exceed two bottles
  - Fixed Combination “CoSopt”

- Fourth medication or modality
  - Brimonidine or ALT/SLT

- Fifth modality - Surgery

When is surgery indicated?

- Poor control
  - progression noted in optic nerve or v. fields
  - account for variability on visual fields
    - repeat test to confirm change

- IOP above target pressure
  - exhausted several or all medical options

- Medication side effects

- Poor compliance