10.7.5. Medical Management of Glaucoma (V): General Approach

Compliance
- patient education
  - first step
  - understanding the disease and benefits of treatment enhances compliance
  - when patients are aware of the possible side effects of a medication, compliance is enhanced
  - include a discussion of treatment alternatives
- teach patients how to properly instill medications
- make drug regimen as simple as possible
  - fewest number of medications with the least frequency
  - coordinate administration with daily events
- written schedule

Generic Medications
- may be less expensive
- little data are available to prove or disprove equivalent efficacy and safety

Use of Glaucoma Medications in Elderly Patients
- elderly patients have greater difficulty instilling their medications
  - tremor
  - poor coordination
  - arthritis
  - reduced mental capacity
  - poor memory
  - complicated drug regimen
- elderly persons have a greater susceptibility to the systemic adverse effects of glaucoma medications
  - α2-agonists
  - β-adrenergic antagonists
    - significant proportion of asymptomatic elderly patients suffer a significant, but reversible, reduction in pulmonary function

Use of Glaucoma Medications During Pregnancy or by Nursing Mothers
- little definitive information concerning the use of glaucoma medications in pregnant women or nursing mothers
- FDA classification system for potential teratogenicity of approved medications
  - A, B, C, D, or X
  - pregnancy Category B
    - definition
      - animal studies have revealed no harm to the fetus, but no adequate and well-controlled studies have been done in pregnant women
      - animal studies have shown an adverse effect, but adequate and well-controlled studies in pregnant woman have failed to demonstrate a risk to the fetus
    - brimonidine
      - can cause respiratory arrest in infants and young children
      - should not be used in these patients
    - B for Brimonidine
  - pregnancy Category C
    - definition
      - no animal studies have been conducted and it is not known whether the drug can cause harm when given to a pregnant woman
      - adverse effect in animal studies, but there are no adequate and well-controlled studies of these drugs in pregnant women
    - all other glaucoma agents
      - timolol
        - tends to be used during pregnancy, because of its long track record
        - β-adrenergic antagonists are concentrated 5x in breast milk
        - should be avoided in nursing mothers because of their potential adverse effects on infants
      - CAIs
        - teratogenic in rodents
        - oral CAIs should not be used by women in their childbearing years or by those who are pregnant
      - prostaglandins
        - increase uterine contractility and may induce labor
        - should not be used during pregnancy
    - should be used during pregnancy only if clearly indicated
  - the most teratogenic X
- minimize the use of medications in pregnant women whenever possible
- consider laser trabeculoplasty or surgical intervention in cases where vision loss is a concern

Administration of Ocular Medications
- show patients how to instill eyedrops properly
- methods to promote corneal penetration and reduce systemic absorption of the drug
  - nasolacrimal occlusion
  - closure of the eyes for 1–3 minutes after instillation of the eyedrop
  - especially important with the use of β-blockers
- ensure that there is a sufficient amount of time between the instillation of different medications
  - ≥5 minutes
- coordinate the administration of medication with a part of the daily routine
- dosing aid device
  - especially for patients who live alone or who are unable to successfully instill eyedrops

Open-Angle Glaucoma
- establish target IOP range
- initiate treatment with a single topical medication
  - unless the starting IOP is extremely high
  - initial medical therapy should be individualized based on the efficacy, safety, and tolerability of the drug and the patient's status and needs
  - briefly discuss treatment options with the patient
- first-line therapy
  - drugs
    - prostaglandin analogues
      - most effective agents to lower IOP
      - best systemic safety profile
      - once-daily
      - commonly the first class of medications used
    - β-blockers
      - best tolerated locally
      - have significant systemic side effects
    - α2-agonists
    - topical CAIs
  - test the medication in 1 eye until the effectiveness of therapy has been established
    - unless the IOP is extremely high
  - if 1 drug is not adequate, the initial agent may be discontinued and another tried
  - if no single agent controls the pressure, a combination of topical agents should be used
- second-line therapy
  - also includes
    - miotic therapy for nonphakic patients
    - in rare instances, systemic CAIs for short periods
- if the patient requires ≥3 medications
  - compliance becomes more difficult
  - potential for local ocular and systemic side effects increases
  - patients may not tolerate multiple topical agents because of preservative toxicity
    - benzalkonium chloride
      - most commonly used preservative
    - if a reaction is suspected, an alternative can be used
      - preservative-free timolol maleate
      - preservative-free tafluprost
      - preservative-free dorzolamide
      - BAK-free travoprost
      - timolol in gel-forming solution preserved with benzododecinium bromide
      - brimonidine 0.1% preserved with Purite
      - preservative-free timolol/dorzolamide fixed combination
    - it may be beneficial, for rehabilitation of the ocular surface, to stop all topical medications and to use unpreserved artificial tears frequently
      - temporary use of oral CAIs may be useful to lower IOP during this period
- ophthalmologist must inquire about systemic side effects
  - modification of systemic β-blocker therapy for hypertension may affect glaucoma control
- patient compliance may decline as the complexity and expense of the medical regimen increase
- monitor patient's optic nerve and visual field status
  - IOP, though important, is only one of several factors to monitor
  - optic nerve photographs
  - visual fields
  - must be compared periodically to ensure that the disease is stable
    - condition of the patient and severity of the disease determine how often each of these parameters must be checked
- if cupping or visual field damage shows evidence of progression despite apparent control of acceptable IOP, consider other diseases
  - IOP level that is too high for the particular patient's optic nerve
  - IOP that may be spiking at times when the patient is not in the physician's office
  - low central corneal thickness
  - sleep apnea
  - concomitant angle closure
  - poor patient compliance

Angle-Closure Glaucoma
- lower the IOP in preparation for laser iridotomy
- rapid IOP reduction is required in order to
  - prevent further damage to the optic nerve
  - clear the cornea of edema
  - reduce intraocular inflammation
  - allow pupillary constriction
  - prevent formation of posterior and peripheral anterior synechiae
- medical therapy for chronic angle closure is the same as that for POAG
  - miotics play a greater role
  - use of miotics may induce a paradoxical increase in IOP if the angle is closed and the trabecular meshwork is nonfunctional

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