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Topic Name : Drug used in Glaucoma

Ch – 3.3

Drug used in Glaucoma

Glaucoma is a group of eye conditions characterized by damage to the optic nerve, often due to increased intraocular pressure (IOP). Medications used in the management of glaucoma primarily aim to reduce IOP to prevent further damage to the optic nerve and preserve vision.

Classification of anti- glaucoma drugs: Glaucoma medications can be classified based on their mechanism of action into several categories, including:

A. Topical Drops:

1. **Beta blockers: e.g.** Timolol, Carteolol, Betaxolol, Levobunolol and Metipranolol
2. **Adrenergic agonists: e.g.** Epinephrine, Dipivefrin, Brimonidine and Apraclonidine
3. **Prostaglandin analogue: e.g.** Latanoprost, Bimatoprost,Unoprostone
4. **Cholinergic agents (Miotics): e.g.** Pilocarpine, Carbachol, Demecarium bromide and Echothiophate iodide
5. **Carbonic anhydrase inhibitors: e.g.** Dorzolamide and Brinzolamide

B. Systemic Drops:

1. **Carbonic anhydrase inhibitors: e.g.** Acetazolamide and methazolamide
2. **Osmotic agents: e.g.** Glycerine, Mannitol and Urea

Mechanism of Action:

- **Prostaglandin analogs:** Increase aqueous humor outflow through the uveoscleral pathway by relaxing the ciliary muscle and widening the trabecular meshwork drainage channels.
- **Beta-blockers:** Reduce aqueous humor production by blocking beta-adrenergic receptors in the ciliary body, thereby decreasing the secretion of aqueous humor.
- **Alpha-adrenergic agonists:** Decrease aqueous humor production and increase uveoscleral outflow.
- **Carbonic anhydrase inhibitors:** Reduce aqueous humor production by inhibiting carbonic anhydrase enzyme activity in the ciliary body.
- **Miotics:** Constrict the pupil (miosis) and increase aqueous humor outflow through the trabecular meshwork.

Dose:

- The dosage of glaucoma medications varies depending on the specific drug, formulation, and severity of the condition.
- Dosages are typically adjusted based on the patient's response to treatment, IOP levels, and any adverse effects experienced.

Uses:

- Management of glaucoma and ocular hypertension: Glaucoma medications are used to lower IOP and prevent optic nerve damage, thereby slowing the progression of the disease and preserving vision.
- Preoperative and postoperative management: Glaucoma medications may be used before and after intraocular surgery to control IOP and reduce the risk of complications.

Contraindications:

- Hypersensitivity or allergy to the drug or its components.
- Certain medical conditions such as severe asthma, heart block, or bradycardia may contraindicate the use of certain glaucoma medications (e.g., beta-blockers).
- Angle-closure glaucoma: Some medications, such as miotics, may exacerbate acute angle-closure attacks and are contraindicated in this condition.
- Patients with certain systemic conditions or taking specific medications may require caution when using glaucoma medications due to potential interactions or adverse effects.