TYPES OF OPHTHALMIC DRUGS

Drugs used to diagnose or treat ophthalmic disorders represent numerous therapeutic classifications, most of which are discussed in other chapters. Major classes used in ophthalmology include the following:

- **Antihistamines** (H_1 receptor antagonists) and **mast cell stabilizers** are used to decrease redness and itching associated with allergic conjunctivitis.
- **Antimicrobials** are used to treat bacterial, viral, and fungal infections (see Chaps. 33 through 41). Bacterial infections include conjunctivitis, keratitis, blepharitis, and corneal ulcers. The drugs are usually applied topically but may be given orally or intravenously.
- **Autonomic drugs** are used for diagnostic and therapeutic purposes (see Chaps. 17 through 21). Some are used to dilate the pupil before ophthalmologic examinations or surgical procedures; some are used to decrease intraocular pressure in glaucoma. Ophthalmic beta-adrenergic blocking agents are the most commonly used drugs for treatment of glaucoma, in which they decrease IOP by decreasing formation of aqueous humor. Adrenergic vasoconstricting drugs are commonly used to decrease redness associated with allergic conjunctivitis.

  Autonomic drugs indicated in one disorder may be contraindicated in another (eg, anticholinergic drugs may be contraindicated in glaucoma). In addition, adrenergic mydriatics (eg, epinephrine, phenylephrine) should be used cautiously in clients with hypertension, cardiac dysrhythmias, arteriosclerotic heart disease, and hyperthyroidism. Ophthalmic beta blockers usually have the same contraindications and precautions as oral or injected drugs (eg, bradycardia, heart block, bronchospastic disorders).
- **Corticosteroids** (see Chap. 24) are often used to treat inflammatory conditions of the eye, thereby reducing scarring and preventing loss of vision. Corticosteroids are generally more effective in acute than chronic inflammatory conditions. Because these drugs are potentially toxic, they should not be used to treat minor disorders or disorders that can be effectively treated with safer drugs. When used, corticosteroids should be administered in the lowest effective dose and for the shortest effective time. Long-term use should be avoided when possible, because it may result in glaucoma, increased IOP, optic nerve damage, defects in visual acuity and fields of vision, cataract, or secondary ocular infections.

  Ophthalmologic corticosteroids may be administered topically, systemically, or both. They are contraindicated in eye infections caused by the herpesvirus because the drugs increase the severity of the infection.
- **Nonsteroidal anti-inflammatory drugs,** in ophthalmic formulations for topical use, may be used in eye disorders (see Drugs at a Glance: Topical Ophthalmic Antiallergic and Anti-Inflammatory Agents and Chap. 7).
- **Prostaglandin analogs** are newer antiglaucoma drugs that apparently reduce IOP by increasing the outflow of aqueous humor. The drugs may be used when a client's IOP is not lowered adequately with a beta blocker or when a beta blocker is contraindicated for a client. When compared with twice-daily ophthalmic timolol, the drugs were considered as effective as timolol. The drugs may be used in conjunction with other antiglaucoma medications (eg, a beta blocker or carbonic anhydrase inhibitor) if multiple drugs are required.

  In clinical trials, the incidence of systemic adverse effects was about the same as with placebo. The most common adverse effects were ocular burning, stinging, and itching. However, the drugs may cause a permanent darkening of eye color, especially in light-colored eyes, and alter eyelashes.

  Nurses who are pregnant should be careful in handling prostaglandin analogs because they may be absorbed through the skin. If accidental contact occurs, the exposed area should be washed immediately with soap and water.
- **Carbonic anhydrase inhibitors** (CAIs) and **osmotic diuretics** are given to decrease IOP in glaucoma and before certain surgical procedures. CAIs lower IOP by decreasing production of aqueous humor.
- **Fluorescein** is a dye used in diagnosing lesions or foreign bodies in the cornea, fitting contact lenses, and studying the lacrimal system and flow of aqueous humor.

OPHTHALMIC DRUG THERAPY

Drug therapy of ophthalmic conditions is unique because of the location, structure, and function of the eye. Many systemic drugs are unable to cross the blood–eye barrier and achieve therapeutic concentrations in ocular structures. In general, penetration is greater if the drug achieves a high concentration in the blood, is fat soluble, and is poorly bound to serum proteins, and if inflammation is present.

Because of the difficulties associated with systemic therapy, various methods of administering drugs locally have been developed. The most common and preferred method is topical application of ophthalmic solutions (eye drops) to the conjunctiva. Drugs are distributed through the tear film covering the eye and may be used for superficial disorders (eg, conjunctivitis) or for relatively deep ocular disorders (eg, glaucoma). Topical ophthalmic ointments may also be used. In addition, ophthalmologists may inject medications (eg, antibiotics, corticosteroids, local anesthetics) into or around various eye structures.

INDIVIDUAL DRUGS

See Drugs at a Glance: Drugs Used in Ocular Disorders, Drugs at a Glance: Ophthalmic Antimicrobial Agents, and Drugs at a Glance: Topical Ophthalmic Antiallergic and Anti-Inflammatory Agents.