**Learning unit: Antiglaucoma drugs and mydriatics**

**Impact of the learning unit**

The aim is to provide students with a basic overview of antiglaucoma and mydriatic agents used in ophthalmology. During the course, students will learn about the mechanisms of action of the most common antiglaucoma agents, their therapeutic application and side effects. Special attention will be paid to the pharmaceutical forms of ophthalmic medicinal products and the most frequent combinations of antiglaucoma drugs used in ophthalmology. Antiglaucoma drugs prevent damage to the optic nerve by reducing intraocular pressure. Acute glaucoma attack requires urgent treatment. Mydriatics are used in ophthalmology for both diagnosis and therapy of ocular diseases, e.g. for prevention of synechiae in eye surgery. Anticholinergic drugs induce cycloplegia along with mydriasis.

**Important terms**

antiglaucoma drugs reducing production of aqueous humour

 carbonic anhydrase inhibitors

 brinzol**amide** (local administration)

dorzol**amide** (local administration)

acetazol**amide** (systemic - orally)

beta adrenergic receptor blockers

 tim**olol** *(non-selective without ISA)*

betax**olol** *(beta 1 selective without ISA)*

carte**olol** *(non-selective with ISA)*

 selective and non-selective sympathomimetics

 alpha 2 adrenergic agonists

brimo**nidine**

 adrenaline (IPP eye drops, therapy of neovascular glaucoma)

antiglaucoma drugs increasing uveoscleral outflow

 direct parasympathomimetics (miotics)

 pilocarpine

 carbachol (miosis during ocular surgery)

indirect parasympathomimetics (miotics)

 physostigmine

 miosis before intraocular surgery

 (earlier also therapy of open-angle glaucoma)

 alpha 2 selective sympathomimetics

 brimo**nidine**

prostaglandin F2 alpha analogues

 latano**prost**

travo**prost**

hyperosmotic antiglaucoma drugs

 mannitol (i.v. in eye surgery)

 glycerol (p.o.)

 not used in chronic therapy of glaucoma

mydriatics

anticholinergics (mydriatic and cycloplegic effects)

 therapeutic mydriatic drugs (long term, prevention of synechiae)

 atropine

 hyoscine (scopolamine) (IPP)

 diagnostic mydriatics (short term, examination of the fundus)

 tropicamide

 cyclopentolate

 homatropine (IPP)

 sympathomimetics

tetryzoline

phenylephrine

**Learning outcomes**

Student knows basic pharmacological profile (mechanism of action, adverse effects, drug administration routes, other indications) of the particular groups of drugs used in the treatment of glaucoma.

Student knows basic pharmacological profile (mechanism of action, adverse effects, drug administration routes, other indications) of mydriatic agents.

Student explains the term cycloplegic agent.

**Recommended study materials**

Rang & Dale's Pharmacology E - Book, Humphrey Rang 8th edition, 2016, chapter 8 (pp. 101–112); chapter 13 (pp. 155–176); chapter 14 (pp. 177–196).

Study materials of the course aVLFA0721p, VLFA0721c, aVLFA0822p and aVLFA0822c.

Chapter 17.4 “Anti-glaucoma and miotic drugs“ and 17.5 „Mydriatics and cyclophlegics“ in the textbook “Pharmacology for students of bachelor’s programmes at LF MU“ (pp. 266-269), in IS aVLFA0822c.

**Exam questions**

*General pharmacology:* 7. Drug administration routes

*Special pharmacology:* 68. Antiglaucoma drugs and cycloplegics

*Detail:* 1. adrenaline/noradrenaline, 3. ephedrine/pseudoephedrine, 4. phenylephrine, 5. oxymetazoline, 10. timolol, 11. atropine, 14. pilocarpine, 16. physostigmine