**Learning unit: Antispasmodics**

**Impact of the learning unit**

Spasmolytic agents have a significant role in therapy of pain. Their indications include smooth muscle spasms and pain in the gastrointestinal, biliary and urogenital tract, including biliary and renal colic. They are used to relieve spasm visceral pains and to relieve spasms in diagnostic and therapeutic procedures such as gastroduodenal endoscopy, radiology, etc. Cholinotropic spasmolytics affect functions mediated by the neurotransmitter acetylcholine. Unlike muscle relaxants that affect the motor system and act on the nicotine N receptors of the neuromuscular junction, the neurotropic spasmolytics act through the muscarinic type (M) of the cholinergic receptors of the parasympathetic nervous system. The spasmolytics acting directly on the smooth muscle cells are called musculotropic spasmolytics. Parasympatholytics are a subset of cholinolytics and include substances that block the muscarinic receptors of the parasympathetic nervous system. The knowledge of spasmolytics and their pharmacology is essential for each student of medicine.

**Important terms**

spasmolytic agents (antispasmodic agents)

 direct cholinolytics

 muscarinic receptor blockers (antimuscarinics - neurotropic spasmolytics = parasympatholytics)

 agents with tertiary nitrogen (blood-brain barrier penetration)

 atropine

 agents with quaternary nitrogen

 butylhyoscine (butylscopolamine)

 otilonium

 fenpi**verinium**

urinary antispasmodicagents

 antimuscarinics

 soli**fenacin** (selective M3 antagonist)

 dari**fenacin** (selective M3 antagonist)

 trospium (M1 and M3 antagonist)

 tolte**rodine** (non-selective antimuscarinic)

 feso**terodine** (prodrug)

 adrenergic agents

 beta 3 agonist

 mirabegron

 musculotropic spasmolytic (antispasmodic) agents

 papa**verine**

 drota**verine**

 mebe**verine**

 al**verine**

 pitofenone

 antispasmodids with combined mode of action (neurotropic and/or musculotropic)

 oxybutinine

 propi**verine**

other antispasmodics

 antiflatulent (carminative) agents

**Learning outcomes**

Student distinguishes the spasmolytics (antispasmodic agents) according to their mechanism of action.

Student knows basic pharmacological profile (mode of action, unwanted effects, indications and contraindications) of parasympatholytics and musculotropic spasmolytics.

Student gives examples of spasmolytic agents according to their indications.

Student describes symptoms of poisoning/overdose with parasympatholytics and proposes pharmacotherapy.

Student gives examples of common spasmoanalgesic combinations.

**Study materials**

Rang & Dale's Pharmacology, 8th edition, 2016, chapter 13, pp. 155-167 (Cholinergic transmission)

Section Antimuscarinic Agents, chapter 28, page 350 (Respiratory system), chapter 29 (The kidney and urinary system), chapter 30, pp. 367-368, 374-378 (The gastrointestinal tract), Section Antimotility and Spasmolytic Agents, chapter 39, pp. 474-476 (Other transmitters and modulators)

Study materials for courses aVLFA0721p and aVLFA0721c.

**Exam questions**

*Special pharmacology*: 5. Antispasmodics - GIT + UGT

*Essential drugs*: 12. butylscopolamine, 13. fenpiverine/pitofenon