

# CLINICAL PHARMACOLOGY OF MEDICATIONS INFLUENCING DIGESTIVE TRACT FUNCTIONS.

## A. Actuality

Currently, a large number of drugs are used in the treatment of digestive tract disorders. At the same time, digestive tract illnesses can influence their kinetics by altering the absorption process, with pharmacokinetic and pharmacodynamic consequences. The clinical implications in such situations are difficult to predict, depending on the physicochemical properties of the medications, the treatment applied, the condition of the illness and the patient's state. They determine the necessity to know the pharmacological properties of the remedies used in digestive tract disorders and the hepatobiliary system.

## B. Training aim

To apply pharmacokinetic and pharmacodynamic principles to the individualization and optimization of medication used in the digestive tract and hepatobiliary system diseases.

## C. Teaching objectives

*The students should be able:*

- a) to characterize the drugs used in digestive tract and the hepatobiliary system diseases according to their pharmacokinetic and pharmacodynamic characteristics;
- b) to prescribe medicinal preparations according to the disease, pathological condition and the particularities of the patient's age;
- c) to assess the clinical effectiveness of the preparations;
- d) to predict the occurrence of adverse reactions depending on the administration regime;
- e) to apply methods of prophylaxis and correction of adverse reactions;
- f) to predict drug interactions;
- g) to select the personal drug (P-drug) and personal treatment (P-treatment) in gastrointestinal disorders.

## D. Knowledge from previously studied disciplines and related subjects

*Medical-biological disciplines:* The macroscopic and microscopic structure of digestive tract organs and hepatobiliary system. Functions and principles of neurohumoral regulation. Age-dependent functional peculiarities.

*Clinical disciplines.* Aetiology, pathogenesis and clinical manifestations of diseases, pathological conditions of the digestive tract and hepatobiliary system. Digestive system disorders diagnostic procedures.

*Pharmacology.* Classification, mechanisms of action, indications, contraindications, adverse effects of medicines used in digestive tract and hepatobiliary system disorders.

## E. Questions for self-training

1. Classification of the drugs with influence on the digestive system.
2. Clinical pharmacology of remedies used in gastric and intestinal gland hyposecretion: classification, peculiarities of the mechanism of action, indications and principles of substitution drugs used.

3. Pancreatic enzyme products: classification, peculiarities of the mechanism of action and effects, indications and principles of use, adverse reactions, pharmacokinetics.
4. Classification of drugs used in gastric hypersecretion and in the treatment of ulcers. Clinical pharmacology of M-cholinoblockers as anti-ulcer medication: classification, peculiarities of anti-ulcer effect, indications and principles of use, adverse reactions, pharmacokinetics, drug interactions.
5. Histamine-H<sub>2</sub> antagonists as anti-ulcer medication: classification, peculiarities of anti-ulcer effect, indications and principles of use, adverse reactions, pharmacokinetics, drug interactions.
6. Proton pump inhibitors as anti-ulcer medication: classification, peculiarities of anti-ulcer effect, indications and principles of use, adverse reactions, pharmacokinetics, drug interactions.
7. Clinical pharmacology of prostaglandin analogues as anti-ulcer medication: peculiarities of anti-ulcer effect, indications and principles of use, adverse reactions, pharmacokinetics.
8. Antacids used in gastric hypersecretion: classification according to solubility, peculiarities of action, indications and principles of use, adverse reactions, drug interactions.
9. Gastro-protectors used in ulcer disease: classification, peculiarities of of action and anti-ulcer effect, indications and principles of use, adverse reactions, pharmacokinetics.
10. Prokinetic drugs: classification, peculiarities of the mechanism of action and pharmacological effects, indications and principles of use, adverse reactions, pharmacokinetics, drug interactions.
11. Classification of laxative and purgative drugs.
  - a) Bulk-forming and stool softener laxatives: peculiarities of laxative effect, indications and principles of use, adverse reactions, drug interactions.
  - b) Osmotic purgatives: peculiarities of laxative and purgative effects, indications and principles of use, adverse reactions, drug interactions.
  - c) Clinical pharmacology of irritant purgatives: classification, peculiarities of the mechanism of action, indications and principles of use, adverse reactions.
12. Classification of antidiarrheal drugs.
  - a) Peculiarities of antidiarrheal effect, indications and principles of use of astringents, mucilaginous and adsorbent drugs.
  - b) M-cholinoblockers and opioid analgesics as antidiarrheal: the peculiarities of action, indications and principles of use, drug interactions.
  - c) Synthetic antidiarrheal drugs: the peculiarities of action and antidiarrheal effect, indications and principles of use.
13. Antiflatulent drugs: classification, peculiarities of antiflatulent effect, indications and principles for selection and use.
14. Classification of antiemetic drugs. The peculiarities of action and use of histamine-H<sub>1</sub> antagonists, dopamine antagonists, serotonin antagonists, M-cholinoblockers, neuroleptics, benzodiazepines, cannabinoids and glucocorticoids as antiemetic medication; side effects, drug interactions.
15. Classification of intestinal anti-inflammatory drugs. Azo-compounds: peculiarities of action, indications and principles of use, adverse reactions, pharmacokinetics.
16. Classification of hepatotropic drugs. Clinical pharmacology of hepatoprotective drugs: classification, mechanism of action, pharmacological effects, indications and principles of selection and use, adverse reactions.

17. Clinical pharmacology of hepatoprotectors of entomological origin: pharmacological effects, indications.
18. Classification of the drugs that stimulate the secretion and excretion of bile.
  - a) Cholagogues and cholagogues: the peculiarities of action and pharmacological effects, indications and principles of use, adverse reactions.
  - b) Cholecystokinetic agents: peculiarities of action and pharmacological effects, indications and principles of use, adverse reactions.
  - c) Cholelitholytic drugs: peculiarities of action and pharmacological effects, indications and principles of use, adverse reactions.
19. Spasmolytic drugs: classification, peculiarities of the mechanism of action and cholelitholytic effect, indications and principles of use, adverse reactions, drug interactions.
20. Peculiarities of drugs use in cirrhosis: mechanism of action, indications and principles of use, adverse reactions.
21. Peculiarities of drugs use in digestive tract disorders during pregnancy, in pediatric and geriatric patients.

**F. Individual work (the 1.1 and 1.2 sequences are to be done in writing form):**

**1.1. Indicate the pharmacological groups and drugs used in (for):** esophageal reflux; irritable bowel syndrome; liver cirrhosis; chronic pancreatitis with hypoacid gastritis; chronic pancreatitis with flatulence; chronic pancreatitis with cholecystitis; hemorrhages from gastric and duodenal ulcer; prophylaxis of iatrogenic ulcers (NSAIDs, glucocorticoids etc.); prophylaxis of ulcers in smokers; Zollinger-Ellison syndrome; for neutralizing the gastric acidity; for protecting and accelerating gastric and duodenal mucosal healing; gastric and intestinal hypomotility; postoperative intestinal atony with meteorism; flatulence and intestinal distention; intestinal colic; persistent functional constipation; constipation in patients with anal lesions; constipation in patients requiring avoidance of defecation effort; gut preparation for radiological and ultrasound examination; postoperative and post-anesthetic vomiting; vomiting in actinic disease; drug-induced vomiting; vomiting in pregnancy; vomiting in motion sickness; acute non-infectious diarrhea; non-specific ulcerative colitis and Crohn's disease; bile replacement during external biliary drainage; cholagogues to prevent biliary stasis; drainage of the bile; to induce contraction of gallbladder; biliary colic; toxic and drug-induced liver injury; pregnancy-related liver disorders; functional and congenital hyperbilirubinaemia; hepatic coma; hepatic encephalopathy; hyperkinetic biliary dyskinesia; hypotonic biliary dyskinesia.

**1.2. For each indication, write the prescription(s) for the drug(s) of choice (from the list of mandatory drugs); the form of delivery and the dosage regimen should be appropriate for the respective pathology:**

Omeprazole, pantoprazole, esomeprazole, famotidine, pirenzepine, octreotide, misoprostol, almagel, sucralfate, bismuth subcitrate, pancreatin, panzinorm, creon 25, neostigmine, drotaverine, atropine, platifiline, butylscopolamine, baralgin, sulphuride, regesan, metoclopramide, domperidone, ondansetron, bisacodyl, sodium docusate, sodium picosulfate, loperamide, bactisubtil, magnesium sulfate, azathioprine, silymarin, esentiale, ademetonine, mesalazine, ursodeoxycholic acid, mebeverine, salazosulfapyridine, imuheptin.

	<b>Denumirea preparatului</b>	<b>Forma medicamentoasă/ doza</b>
1	Omeprazole	Capsules 0,01; 0,02; 0,04 Lyophilized powder for solution for infusion 0,04 in vials
2	Pantoprazole	Tablets 0,02; 0,04 Lyophilized powder for solution for infusion 0,04 in vials

3	Esomeprazol	Capsules 0,02; 0,04 Lyophilized powder for solution for infusion 0,04 in vials
4	Famotidine	Tablets 0,01; 0,02; 0,04 Lyophilized powder for solution for infusion 0,02 in vials
5	Octreotid	Sol. 0,01%-1ml; 0,005%-1ml in ampoules
6	Colloidal bismuth subcitrate	Tablets 0,12
7	Pancreatin	Tablets 10000UI; Capsules 10000 UI; 25000UI;
8	Neostigmine	Sol. 0,05%-1ml în fiole
9	Drotaverine	Tablets 0,08; 0,04 Rectal suppositoires 0,04 Sol. 2%-2ml in ampoules
10	Atropine	Sol. 0,1%-1ml in ampoules
11	Sulpirid	Tablets 0,05; 0,1; 0,2; Capsules 0,05 Sol. 5%-2ml in ampoules
12	Metoclopramide	Tablets 0,01 Sol. 0,5%- 2ml in ampoules
13	Domperidone	Tablets 0,01
14	Ondansetron	Tablets 0,008 Sol. 0,2%-4ml in ampoules
15	Aprotinin	Sol. 100000 UIK 10ml in ampoules
16	Bisacodyl	Tablets 0,005 Rectal suppositoires 0,01
17	Sodium picosulphate	Tablets 0,0075 Oral sol. 0,75%-15ml; 30ml in vials
18	Loperamide	Tablets/ capsules 0,002
19	Silymarin	Tablets 0,0225; 0,035; 0,15 Capsules 0,07; 0,11; 0,14; 0,15; Drajee 0,0225; 0,15
20	Ademetionine	Tablets 0,4; 0,5; Lyophilized powder 0,4; 0,5 in vials
21	Mesalazine	Tablets 0,5 Rectal suppositoires 0,25; 0,5; 1,0
22	Ursodeoxycholic acid	Tablets 0,5 Capsules 0,15; 0,25; 0,3 Oral suspension 5%-30ml; 40ml; 200ml in vials
23	Mebeverine	Tablets 0,2 Capsules 0,1

**1.3. Tests. Tests on Clinical Pharmacology** (for faculty of medicine), Chisinau-2004, page 29.

### **G. Interactive activity**

**1. The didactic instructional work and the patient's discussion.**

**2. Clinical-pharmacological selection and use of drugs in digestive system disorders:**

- Principles for the selection and use of drugs in hyperacid gastritis;
- Principles for the selection and use of drugs in gastric and duodenal ulcers;
- Principles for the selection and use of drugs in acute pancreatitis;
- Principles for the selection and use of drugs in chronic pancreatitis.

**3. Clinical cases. *Clinical cases in Clinical Pharmacology*, Chisinau-2017, page 49.**

**4. Personal Drug (P-Drug) selection according to the criteria of efficacy, safety, acceptability and cost.**