

CLINICAL PHARMACOLOGY OF ANTIMICROBIEN CHEMOTHERAPEUTIC DRUGS WITH DIVERS CHEMICAL STRUCTURE

A. Actuality

Antimicrobien synthetic chemotherapeutic drugs - sulfamides, derivatives of naphthyridine and quinolone, nitroimidazole, 8-oxyquinoline, nitrofurantoin, oxazolidinone and thiosemicarbazone possess antibacterial, antifungal and antiprotozoal properties and are widely used to treat infections caused by these pathogenic microorganisms. Knowledge of their pharmacokinetics and pharmacodynamics will allow their rational selection, association with other preparations and setting of optimal dosing regimen in the treatment of infectious diseases.

B. Training aim

Acquiring clinical and pharmacological principles to justify the prescription, use, dosing regimen of drug preparations in the given groups, and to assess their efficacy and harmlessness.

C. Teaching objectives

The student should be able to:

- a) choose a minimal complex of investigative methods, in order to assess the pharmacodynamic effect of the chosen drug;
- b) analyze and assess the results of pharmacodynamic study of chemotherapeutic agents with various chemical structure, obtained by laboratory and instrumental methods;
- c) differentiate chemotherapeutic remedies according to pharmacokinetic and pharmacodynamic peculiarities;
- d) develop the criteria for assessing the clinical efficacy of chemotherapeutic drugs;
- e) prognosticate the occurrence of possible complications and side effects of the drugs, depending on the pharmacological group of the drug;
- f) prognosticate the dependence of side effects on the dosing regimen and on the functional state of the organs and body systems.
- g) predict the interactions of the chemotherapeutic remedies with different chemical structure between them and with other drugs;
- h) elaborate the personal form (P-drugs) for antimicrobien chemotherapeutic drugs with divers chemical structure.

D. Knowledge from previously studied disciplines and related subjects

Histology, morphopathology, pathophysiology and microbiology

Cell structure of pathogens. Classification of pathogenic germs. Determining the sensitivity of pathogens to specific chemotherapeutic drugs.

Clinical disciplines. Etiology, pathogenesis of the main nosological forms of infectious pathologies. Clinical manifestations of infectious diseases. Functional and laboratory tests applied in pulmonology, septic surgery, urology, etc.

Pharmacology. Antimicrobien synthetic chemotherapeutic drugs (sulfamides, derivatives of naphthyridine and quinolone, nitroimidazole, 8-oxyquinoline, nitrofurantoin, oxazolidinone and thiosemicarbazone): classification according to chemical structure, mechanism of action and developed effect, spectrum of action; indications, side effects of drugs of the given groups.

E. Questions for self-training

I. Clinical and pharmacological characteristics of antimicrobien synthetic chemotherapeutic drugs with divers chemical structure

1. Clinical pharmacology of Sulfamides. Classification of sulphamides. Sulfamides with systemic action. Particularities, spectrum and mechanism of action. Pharmacokinetics. Indications and principles of dosage and choice. Contraindications. Adverse reactions - clinical manifestations, methods of prophylaxis and treatment. Drug interactions. Resistance and combat.

2. Sulfamides with action in the intestine and azocompounds. Particularities of the spectrum of action. Indications and principles of use. Contraindications, side effects, prophylaxis and control. Pharmacokinetics. Drug interactions.

3. Sulfamides for topical use. Particularities of the spectrum of action. Indications and principles of use.
4. Combined preparations of sulfamides. Particularities of the spectrum and mechanism of action. Indications and principles of use. Contraindications, side effects, prophylaxis and control. Pharmacokinetics. Drug interactions.
5. Chinolin derivatives and fluoroquinolones: classification. Non-fluorinated quinolones: action spectrum, indications. Fluorquinolones: classification, spectrum features and mechanism of action of fluorquinolones from different generations. Indications and principles of selection and use. Absolute and relative contraindications. Adverse reactions - prophylaxis and their treatment. Drug interactions. Pharmacokinetic aspects.
6. Derivatives of nitroimidazole: classification. Spectrum peculiarities and mechanism of action. Pharmacokinetic aspects. Indications and principles of selection and use. Contraindications. Side effects, their prophylaxis and treatment. Drug interactions. Pharmacokinetic features.
7. Derivatives of 8-oxyquinoline. Spectrum peculiarities and mechanism of action of systemic and topical drugs. Pharmacokinetic aspects. Indications and principles of selection and use. Contraindications. Side effects, their prophylaxis and combating. Drug interactions. Pharmacokinetic aspects.
8. Derivates of nitrofuran: classification. Spectrum peculiarities and mechanism of action of systemic, intestinal and topical drugs. Pharmacokinetic aspects. Indications and principles of selection and use. Contraindications. Side effects, their prophylaxis and combating. Drug interactions. Pharmacokinetic aspects.
9. Derivates of thiosemicarbazone and similar drugs. Peculiarities of action, use and dosing. Side effects, their prophylaxis and combating.
10. Oxazolidinediones. Spectrum peculiarities and mechanism of action, pharmacokinetic aspects. Indications and principles of selection and use. Contraindications. Side effects.
11. Pharmacokinetic and pharmacodynamics aspects of synthetic chemotherapeutic drugs in children. Peculiarities of synthetic chemotherapeutic drugs administration in pregnancy and lactation period.

II. Clinical and pharmacological selection and use of drugs in some pathological conditions and diseases:

Principles of combined sulfamide selection and use in the treatment of infectious diseases.

Principles of fluorquinolones selection and use in the treatment of infectious diseases.

Principles of the selection and use of nitroimidazole derivatives in the treatment of protozoan and anaerobic infections.

Principles of the selection and use of chemotherapies of different chemical structure in urinary infections.

Principles of selection and use of chemotherapies of diverse chemical structure in infections of the digestive tract.

F. Individual work

1. Brief characterization of main drugs

vertically – International Nonproprietary Name (INN) of drug,

horizontally – synonyms, forms of delivery, mode of administration, (therapeutic, maximal) doses, mechanisms of action, indications, contraindications, side effects:

norfloxacin, moxifloxacin, tinezolid, nufiroxazide.

2. Exercises on medical prescription (see methodological instructions for practical works on pharmacology for the 3rd year):

sulfaethiol, sulfadimetoxime, ftalilsulfatiazol, sulfasalazine, mesalazine, sulfacetamide, co-trimoxazole, nalidixic acid, pipemidic acid, ofloxacin, ciprofloxacin, moxifloxacin, tinidazole, metronidazole, nitroxoline, furazolidone, nitrofurantoin, nifuroxazide, linezolid.

3. Indicate the drugs used in (for):

bacterial dysentery; amebian dysentery; trichomonadosis, urinary infections; intestinal infections; infections caused by atypical germs (legionella, mycoplasmas, chlamydias); oral

anaerobic infections; protozoal infections; gastric and duodenal ulcer; prophylaxis of anaerobic infections; local treatment of wounds and combustions; acute streptococcal infections of the oral cavity and pharynx; pseudomembranous colitis; pulmonary tuberculosis; nonspecific ulcerative enterocolitis; conjunctivitis; respiratory infections; infections caused by *Bac. fragilis*; infections caused by *Pseudomonas aeruginosa*; osteomyelitis; lamblia; systemic staphylococcal infections with poly-resistance.

4. Tests on Clinical Pharmacology (for faculty of medicine), Chisinau-2004, page 103.

5. Clinical cases in Clinical Pharmacology (Clinical Cases Guide), Chisinau-2017, page 141.

6. Virtual situations.

7. Personal Drug (P-Drug) Selection and P-Treatment (Personal Treatment) according to the criteria of effectacy, safety, acceptability and cost for inclusion in the personal form (P drugs).