

CLINICAL PHARMACOLOGY OF DRUGS USED IN AFFECTIONS OF THE RESPIRATORY SYSTEM

A. Actuality

Respiratory system affections are the most frequent encountered in internist's practice, especially in ambulatory health care. Unserious attitude, of the patients towards these diseases, leads in many cases, to the development of chronic process with appearance of serious complications. Drugs' diversity that can be used in these affections imposes a scrupulous study of their pharmacodynamics and pharmacokinetics. This will allow to select a harmless and suitable treatment, which in case of such chronic diseases as bronchial asthma, obstructive bronchitis are administrated for a long period, accompanied by drugs efficiency decreasing.

B. Training aim

To deepen knowledge of the pharmacology of drug groups used in the treatment of respiratory diseases. Acquire and apply the pharmacokinetic and pharmacodynamic principles to individualize and optimize the administration of these drugs.

C. Teaching objectives

The students should be able to:

- a) Elucidate pharmacodynamic and pharmacokinetic peculiarities of drug groups used in respiratory system diseases.
- b) Establish dosage principles of drugs depending on group affiliation and etiology and severity of the disease.
- c) Forecast possible side effects and complications, to establish their dependence on dosing regimen, their prophylaxis.
- d) Apply contemporary methods of pharmacological and non-pharmacological correction of drug-induced adverse drug reactions.
- e) Write down the personal form (P-medicines) of drugs used to treat respiratory system diseases.

D. Knowledge from previously studied disciplines and related subjects

Medico-biological subjects. Respiratory system anatomy. Neurological and hormonal influence on the respiratory system. Chemoreceptors importance in regulation of respiration. Trachea, bronchi, alveolar acinus: structure, functions. Autonomic nervous system influence on respiratory system. The main causes of respiratory failure. Bronchial obstruction, mechanisms of development.

Clinical subjects. Respiratory system diseases (bronchitis, pneumonia, bronchial asthma, pulmonary abscess, pulmonary edema etc.). Their classification, clinical manifestation, pathogenesis and etiology, treatment principles.

Pharmacology. Classification of drugs affecting respiratory system (analeptics, antitussives, expectorants and mucolytic, bronchodilators). Drug groups used in pulmonary edema – mechanism of action, effects, indication, side effects.

E. Questions for self training

I. Clinical-pharmacological characteristics of drug groups used in respiratory diseases.

1. The bronchodilators classification.
2. The bronchodilators from β -adrenoreceptor agonists group: classification, mechanism of action, benefit in bronchial asthma, indications and principles for selection and use in various clinical situations, adverse reactions and their prophylaxis, comparative pharmacokinetics of inhaled beta-adrenomimetics, synergistic drug interactions. Pharmacogenetic principles of β -adrenomimetic drugs use.

3. Selective M-cholinoblockers as bronchodilators: peculiarities of mechanism of action, benefit in bronchial asthma, indications and principles for administration, side effects, pharmacokinetics, drug interactions.
4. Methylxanthines as bronchodilators: peculiarities of mechanism of action and benefit in bronchial asthma, indications, principles for selection and use in various clinical situations, adverse reactions and their prophylaxis, pharmacokinetics, drug interactions. **Rapid release and slow-release forms.**
5. Inhaled and systemic glucocorticoids as antiasthmatic drugs: classification, features of the mechanism of action in bronchial asthma, indications and principles of chronopharmacological uses, **dosage regimen**, adverse reactions and their prophylaxis, pharmacokinetics, drug interactions. Advantages of the inhaled glucocorticoids.
6. Inhibitors of mast cell degranulation in asthma diseases: classification, features of mechanism of action in bronchial asthma, indications and principles of use, adverse reactions and their prophylaxis, pharmacokinetics, drug interactions.
7. Leukotriene receptor blockers used as antiasthmatic drugs: features of the mechanism of action in bronchial asthma, indications and principles of selection and use in those situations, adverse reactions and their prophylaxis, pharmacokinetics.
8. Inhibitors of 5-lipoxygenase as antiasthmatics. The features of the mechanism of action in bronchial asthma, indications and principles of use, adverse reactions and their prophylaxis, pharmacokinetics.
9. Biological drugs: monoclonal antibodies to E immunoglobulins (class) for the treatment of bronchial asthma: features of the mechanism of action, indications and principles of use, adverse reactions and their prophylaxis, pharmacokinetics, drug interactions.
10. Principles of treatment of asthma status.
11. Particularities of use of bronchodilators in pregnant, pediatric and geriatric.
12. Clinical pharmacology of antitussive remedies: classification, peculiarities of mechanism of action and antitussive effect, indications and principles of use, adverse reactions and their prophylaxis, pharmacokinetics. Peculiarities of use in various clinical, pediatric and geriatric situations.
13. Clinical pharmacology of expectorant and mucolytic remedies. Principles of selection and use in clinical situations. Particulars of use in pediatrics and geriatrics.
14. Clinical pharmacology of drugs used in di-stress respiratory syndrome in newborn.
15. Principles of action and use of drugs administered in pulmonary edema.

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

Principles for the selection and use of drugs in exacerbation of asthma;

Principles of drug selection and use in the treatment of atopic bronchial asthma;

Principles for the selection and use of drugs in pulmonary edema;

F. Individual Work:

1. Brief characterization of the main drugs.

Vertically: International Nonproprietary Name (INN) of drug

Horizontally: synonyms, delivering forms, mode of administration, doses (therapeutic, maximal), mechanism of action, indications, contraindications, side effects.

Salmeterol+fluticasone, fluticasone, clenbuterol, oxitropium bromide, theophylline, ambroxol, dextromethorphan, omalizumab.

2. Exercises on medical prescription (see year III):

Salbutamol, aminophylline, ipratropium, sodium cromoglycate, ketotifen, beclomethasone, dexamethasone, prednisolone, montelukast, zileuton, acetylcysteine, bromhexine, codeine, prenoxidiazine.

3. Indicate drugs used in (for):

the systematic treatment of hormone-dependent bronchial asthma; obstructive chronic bronchopneumopathy; chronic bronchitis; acute bronchitis; pulmonary edema with arterial hypertension; pulmonary edema with arterial hypotension; pulmonary edema of non-cardiac etiology; convulsive cough; unproductive cough in pneumonia, neonatal apnea, Cein-Stocs' breathing disorder, bronchoscopy, asthma status.

4. Tests on clinical pharmacology (for faculty of medicine). Chisinau, 2014, p.21.

5. Clinical cases in clinical pharmacology. Chisinau, 2017, p.34.

6. Virtual situations.

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