CLINICAL FARMACOLOGY OF MEDICATIONS WITH INFLUENCE AFTER HEMOSTASIS AND FIBRINOLYSIS.

A. Actuality

The dynamics of the coagulant, anticoagulant and fibrinolytic systems determine the state of tissue circulation and metabolic processes. In most diseases and pathological conditions, the ratio of these systems is disturbed. Moreover, platelet aggregation, hypercoagulability with the trombus formation causes serious complications, including deadly: pulmonary artery embolism, cerebral vessels embolism, etc. Medications with action on coagulant, anticoagulant and fibrinolytic systems are used to ensure adequate tissue circulation.

B. Training aim

Acquiring and deepening of knowledge about the pharmacodynamic and pharmacokinetic properties of drugs with influence on blood coagulability, anticoagulant and fibrinolytic system. plasma volume expanders.

C.Teaching objectives

The student should be able to:

a) Elucidate the mechanisms of action, indications, contraindications and adverse reactions of antithrombotic, hemostatic and drug substances used in hematopoietic disorders.

b) Estimate the usage and dosage principles of hemostatic and antithrombotic drugs depending on the disease and pathological states.

c) Establish the principles of drugs' interactions of hemostatic and antithrombotic agents with other drugs and predict the possible side effects.

d) Write down personal form (P-medicines).

D.Knowledge from previously studied disciplines and related subjects

Medico-biological subjects. Cellular components of the blood. The links of the blood clotting cascade. The blood anticoagulant and fibrinolytic system. The role of platelets in the coagulation process. Pathology of blood coagulation and fibrinolysis.

Clinical subjects: CID syndrome (disseminated intravascular coagulation), ethiopathogenesis, phases, forms and clinical manifestations. Coagulogram indices and their deviation within pathologies accompanied by hypo- or hypercoagulation. Physiological anticoagulants (antithrombin III, proteins C and S). Hemophilia.

Pharmacology. Classification of hemostatic and antithrombotic drugs. Pharmacodynamics of coagulants, antifibrinolytics, anticoagulants, fibrinolytics, antiaggregants.

E.Questions for self- training

I. Clinical-pharmacological characteristics of drug groups influencing on hemostasis and fibrinolysis.

1. Medicines with influence on hemostasis and fibrinolysis. Classification according to the mechanism of action, pharmacological effects and clinical use.

2. Clinical pharmacology of direct anticoagulants. Mechanism of action, pharmacological effects, clinical uses to prevent thrombosis in stomatological affection. Dosage principles, contraindications, side effects. Drug interaction. Clinical pharmacology of the low-molecular-weight heparins. Comparative characteristics of standard heparin and low molecular weight heparins. Heparin antagonists, usage principles. Methods to verify the efficacy and safety of direct anticoagulants.

3. Clinical pharmacology of indirect (oral) anticoagulants. Classification. Usage and dosage principles, drug interaction. Comparative characteristics of direct and indirect (oral) anticoagulants.

4. Clinical pharmacology of the antiplatelets drugs. Classification, mechanisms of action, pharmacological effect, clinical uses in stomatological and internal organs affections. Dosage, adverse effects. Drug interactions.

5. Fibrinolytics: classification, pharmacodynamic and pharmacokinetic peculiarities, indications, dosing regimen and principles of use, contraindications, adverse reactions, prophylaxis and their treatment. Clinical pharmacology of fibrinolytic inhibitors. Principles of dosage and usage. Drug interaction.

6. Classification of hemostatic drugs. Direct and indirect coagulants: peculiarities of the mechanism of action, indications, contraindications and adverse reactions. Principles of usage and dosage regimen in stomatology. Clinical usage of vitamin K . Drug interaction.

7. Local hemostatics: characteristic of vasoconstrictors, astringent and thromboplastinic drugs, indications, contraindications and adverse reactions, principles of rational selection and use.

8. Systemic hemostatics: classification, pharmacodynamic and pharmacokinetic peculiarities, indications, contraindications and adverse reactions, principles of rational selection and use.

9. Clinic pharmacology of aggregants. Principles of clinical usage in stomatology. Drug interaction.

10.Synthetic antifibrinolytics and animal origin: features of the mechanism of action, indications, contraindications and adverse reactions, the principles of rational selection and use.

11.Pharmacological management of the disseminated intravascular coagulation (DIC) syndrome.

12.Angioprotectors. Classification, mechanism of action and usage principles.

13.Plasma volume expanders. Classification, usage principles.

14. The peculiarities of the use of drugs with influence on hemostasis, fibrinolysis in various physiological states (pregnancy, lactation), in the elderly and children.

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

• Principles of selection and use of drugs in CID syndrome depending on phases.
• Principles for the selection and use of medicines in hemophilia.

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.

Abciximab; tirofiban; rivaroxoban; phytomenadione; etamsilat; rutoside; bivaluridine; warfarine; clopidogrel; diosmine; hesperidine.

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

Heparin, ethyl biscumacetate, phytomenadione, streptokinase, acetylsalicylic acid, fibrinogen, aminocapronic acid, nadroparin, protamine sulfate, acenocumarol, ticlopidin, alteplase, aprotinine, pentoxiphylline, dextran.

3. Indicate drugs used in (for):

epistaxis, capillary hemorrhages, hemorrhage after tooth extraction, hemorrhages during otorinolaringological interventions, hypofibrinogenemia, hemophilia, hemorrhages by overdose of direct-acting anticoagulants, hemorrhages by overdose of indirect-action anticoagulants, hemorrhagic disease of the newborn, hemorrhages through capillary fragility, hemorrhages with hyperfibrinolysis,

menorrages, hemorrhages by fibrinolytic overdose, pulmonary artery thromboembolism, deep vein thrombosis, acute myocardial infarction with hypercoagulability, acute coronary syndrome, thrombosis prophylaxis in surgery and obstetrics, disseminated intravascular coagulopathy syndrome, obliterating endarteritis, heparin-induced thrombocytopenia,

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

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

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).