

Ministry of Health of the Republic of Belarus
Education Establishment
"Gomel State Medical University"
Normal Physiology Department

It was discussed at the department meeting 30.08.16
The protocol № 8

METHODICAL INSTRUCTION

for carrying out classes by teachers with the 2nd course students
of Faculty for training specialists for foreign countries (teaching in English)
on normal physiology

Topic: Physiology of leukocytes and thrombocytes. Coagulation system.

General time of the class 4 hours.

**1. THE STUDYING AND EDUCATIONAL PURPOSES, THE MOTIVATION FOR
ASSIMILATION OF THE SUBJECT, REQUIREMENTS TO THE INITIAL LEVEL OF
KNOWLEDGE**

Students have to acquire the main properties, functions and quantity of leukocytes and thrombocytes, and also to know the main stages of coagulation.

Motivational characteristic of the subject

The general clinical blood test is one of the most widespread laboratory researches. Therefore the medical student needs to know standards and physiological value of parameters of the general blood test. And also to be able to define quantity of leukocytes and to have an idea of methods of leukocytic formula calculation, morphology of leukocytes, coagulogramma, definition of blood clotting time.

Tasks of the class

In the course of the class students have to master a technique of definition of leukocytes amount, and also master a technique and be able to define coagulation time by Althausen.

As a result of carrying out the class the student has to:

To know:

- coagulation stages;
- structure and functions of leukocytes;
- diagnostic value of leukocytic formula;
- the basic concepts and terms on the class subject;
- basic physiological constants on the class subject

To be able:

To define quantity and morphology of leukocytes and time of coagulation by Althausen.

2. CONTROL QUESTIONS FROM RELATED SUBJECTS:

1. Structurally functional characteristic of leukocytes.
2. Factors of blood coagulation.

3. CONTROL QUESTIONS ON THE CLASS SUBJECT:

1. Leukocytes, their classification, properties and functions.
- 2.1. Leukocytic formula, index of regeneration of leukocytes, their diagnostic value.

- 2.2. Leukocytosis, its types.
3. Thrombocytes, their structure, properties and functions.
4. System of hemostasis.
 - 4.1. Vascular platelet hemostasis.
 - 4.2. Coagulation hemostasis.
 - 4.2.1. Plasma and cellular factors of coagulation.
 - 4.2.2. Phases of coagulation hemostasis. Coagulation time. The factors which are slowing down and accelerating coagulation.
5. Fibrinolysis. Factors providing it. The anticoagulation mechanisms. Anticoagulants.
6. Regulation of coagulation and of fibrinolysis.

Questions for independent studying

1. Immune properties of blood. Types of immunity.
2. Hemophilia reasons.

Report:

1. Respiratory function of blood.

4. PRACTICAL PART OF THE CLASS

Laboratory work 3.1. Definition of leucocytes amount

Laboratory work 3.2. Evaluation of leukocyte morphology.

Laboratory work 3.3. Definition of blood coagulation time by Althausen

5. THE COURSE OF THE CLASS

- *Introduction*: the teacher answers questions of students which caused certain difficulties in the course of independent mastering of education material;

- *Requirements to the initial level of knowledge*: From biochemistry and histology students should know the morpho-functional characteristic of leucocytes and factors of coagulation.

- *Correction of the initial level of knowledge*: The teacher checks and adds the initial level of knowledge of students on theoretical and application-oriented questions on the subject of the class "Physiology of leukocytes and thrombocytes. Coagulation system." In this section questions of classification and functions of leukocytes, structure and functions of thrombocytes, phases of vascular platelet and coagulation hemostasis, the factors providing fibrinolysis, regulation of blood coagulation and fibrinolysis are considered. The teacher corrects the answers of students on the considered subject;

Students read the report on the class subject with its subsequent discussion.

- *Setting of problems which will be solved by students*: - The teacher sets a task to master technology of definition of leukocytes quantity, and also determination of speed of coagulation;

- *Independent performing of tasks by students*: Students perform practical work under monitoring of the teacher and laboratory assistant. In a workbook students make out the protocol of laboratory work with the subsequent discussion of a technique of performance;

- *Assessment of final level of knowledge of the class subject*: - The teacher specifies the final level of knowledge of students on theoretical and practical questions, the basic concepts and terms, and also knowledge of basic physiological constants of the class subject;

- *Fixing of knowledge*: The teacher suggests students to solve several situation-dependent problems on the class subject, to pass computer test on the class subject;

- *The conclusion of the teacher and the task to the next class*: At the end of the class the teacher makes the conclusion about the carried-out work and tells students the home task for the independent work. Then summing up the results of the class and signing of experience protocols is made.

Note: time of breaks is 15 minutes during a class.

6. QUESTIONS FOR SELF-CHECKING OF KNOWLEDGE

1. At the healthy person at the general blood test the increased amount of leucocytes is revealed. Does it mean the presence of inflammatory process in an organism?
2. At calculation of total number of leucocytes in a peripheral blood its augmentation is revealed. What additional blood analyses need to be conducted to resolve an issue of whether the leukocytosis is physiological or reactive?
3. In what phase of blood coagulation the prothrombin turns into thrombin?
4. How does the heparin work?

LITERATURE

Basic

1. Human physiology: textbook for overseas students = Физиология человека: учеб. пособие для иностранных студентов, обучающихся на английском языке / А. И. Киеня [и др.]; под ред. проф. Э. С. Питкевича; пер. на англ. яз. Р. А. Карпов, В. А. Мельник. — Гомель: УО ГомМУ, 2009. — 352 с.
2. Сборник нормативных документов по проблеме ВИЧ/СПИД. Минск, 1999. 132 с. Приказ № 351 от 16.12.1998г. Приложение № 8 «Инструкция о профилактике внутрибольничного заражения ВИЧ-инфекцией и предупреждению профессионального заражения мед. работников». С. 31-35.
3. Text of lectures.

Alternate

1. Textbook of medical physiology // C. Guyton, 2006. — 1116 p.
2. Human anatomy and physiology // Alexander P., Spence-Elliott B. Masson.
3. Human physiology. The mechanisms of body function // Arthur J. Vander James H Sherman Dorothy S. Luciano, 1986. — 715 p.
4. Lecture notes on human physiology // John J Bray, Patricia A. Cragg, Anthony D.C. Macknight, Roland G. Mills and Douglass W. Taylor.
5. Human anatomy and physiology // Elaine N. Marieb, 1989. — 995 p.
6. Review of medical Physiology, International edition, 2003. — 912 p.