METHODOLOGICAL INSTRUCTIONS FOR PRACTICAL CLASSES

Discipline: General pathology

Discipline code: GP 3214

EP name and code: 6B10115 "Medicine"

Volume of study hours/credits: 90 hours/3 credits

Course and semester of study: III year, V semester

Volume of practical classes: 24 hours

Shymkent, 2024

Methodological instructions for practical classes are developed in accordance with the working study program of the discipline (syllabus) 6B10115 “Medicine” and discussed at the department meeting

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Head of the Department _____ Sadykova A.Sh.

Class No. 1

1. Topic: Subject, tasks and methods of pathological physiology. General nosology. General etiology and pathogenesis.

2. Goal: - to teach the use of the main categories and concepts of general nosology in the assessment and pathophysiological analysis of typical pathological processes.

- teach to determine the significance of etiological factors in the occurrence and development of the pathological process, as well as cause-and-effect relationships in pathogenesis.

3. Learning objectives

- study the significance and possibilities of modeling pathological processes and experimental therapy;
- study the basic concepts of nosology;
- apply the categories and concepts of general nosology in the pathophysiological analysis of typical pathological processes;
- study the significance of etiological factors in the occurrence and development of the pathological process;
- determine cause-and-effect relationships in pathogenesis.

4. Main questions of the topic

1. Subject and tasks of pathophysiology.
2. Methods of pathophysiology.
3. Basic concepts of general nosology.
4. Etiology.
5. Damage as the initial link in pathogenesis.
6. Cause-and-effect relationships in pathogenesis.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study;

Practical work

Goal: to create a model of the pathological process - kinetosis.

Mice are placed in a cloth bag and suspended from the disk of a manual centrifuge (carousel). Scroll for 30-40 seconds and quickly remove. Observe the general condition, changes in breathing and mobility of animals. Mice make movements around the axis of their body and in circular movements.

Questions

1. In which animals is the pathological process caused?
2. What pathogenic factor was the animal exposed to in this experiment?
3. What is the mechanism of development of this pathological process?

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. Subject and tasks of pathological physiology; its place among other medical sciences.
2. Main sections of pathological physiology.
3. Methods of pathophysiology.
4. Significance of the experiment. General principles for constructing medical and biological experiments and interpreting their results.
5. Basic concepts of general nosology.
6. Normal, health, pre-illness, illness.
7. Stages of the disease. Outcomes. Recovery, complete and incomplete.
8. Etiology. Definition.
9. The role of causes and conditions in the occurrence of the disease and their relationship.

10. The main exogenous and endogenous causes of diseases.
11. Pathogenic effects of environmental factors and their classification.
12. Damage as the initial link in pathogenesis.
13. Cause-and-effect relationships in pathogenesis.

Tests

1. The study of the causes and conditions of the occurrence of a disease is called**....**
A) nosology
B) pathogenesis
C) etiology
D) pathology
E) valeology
2. Pathological physiology is a science that studies....
A) general patterns of the onset, course and end of the disease
B) vital activity of the body under physiological conditions
C) classification and nomenclature of diseases
D) clinical manifestations of diseases
E) the effect of drugs on the human body
3. Mandatory in a pathophysiological experiment is....
A) study of functional indicators
B) animal modeling of human disease
C) study of morphological indicators
D) study of biochemical parameters
E) study of clinical indicators of the disease
4. A scar on the skin after a burn refers to....
A) pathological process
B) pathological reaction
C) pathological condition
D) pathological activation
E) pathological suppression

Situational task

The patient received a second degree thermal burn of 25% of the body surface. The general condition is serious. The patient is excited, has a sharp thirst, the pulse is frequent, weak filling and tension. Blood pressure 100/60 mm Hg.

Questions

1. How can you characterize the patient's condition?
2. What are the pathophysiological basis of the therapeutic measures that the patient needs?

Class No. 2

1. Topic: Cell pathology.

2. Goal: to teach how to analyze the causes, mechanisms of development and outcomes of pathological processes at the cellular level.

3. Learning Objectives

- study the principles and methods of identifying, correcting and preventing damage at the cellular level;
- apply knowledge in cases associated with cytolytic syndrome in various diseases.

4. Main questions of the topic

1. Cell damage.
2. Exogenous and endogenous factors of cell damage.
3. Typical mechanisms of cell damage.

4. Features of damage to the cells of the child's body.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study

Practical work

Goal: to create a model of hemolytic anemia.

To simulate hemolytic anemia, mice were injected with phenylhydrazine, which is known to stimulate free radical reactions in cells. Half an hour after the administration of phenylhydrazine, a decrease in the number of red blood cells and the presence of free hemoglobin and methemoglobin were found in the blood of the animals.

Questions

1. What are the mechanisms of damage to erythrocyte membranes?

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. Characteristics of the concept of "cell damage".
2. Exogenous and endogenous factors of cell damage.
3. Structural, metabolic, physicochemical and functional changes in the cell during its reversible and irreversible damage.
4. Typical mechanisms of cell damage.
5. The role of free radicals and Ca^{2+} in cell damage.
6. Adaptive reactions of a cell when it is damaged.
7. Features of damage to cells of a child's body.

Tests

1.What substances present on cell membranes in children:

A) non-esterified fatty acids
B) lysophospholipids
C) bile acids
D) lactate
E) glycogen

2. Manifestations of imbalance of ions and water in the cell during ischemic damage include:

a) accumulation of K^+
b) accumulation of Na^+
c) decrease in the content of $C1^-$
d) accumulation of PO_4^-
e) decrease in the content of H^+
f) overhydration
g) accumulation of HCO_3^-
h) accumulation of OH^-

3. The difference between poptosis and necrosis is....

a) occurs when there is severe damage to cell membranes, including the plasma membrane
b) ensures the removal of "extra" cells under physiological conditions
c) initiates inflammation
d) accompanied by "shrinking" of cells
e) lysosomal enzymes play a role in the implementation of its mechanisms
f) cytosolic caspases play a role in the implementation of apoptosis mechanisms
g) genetically programmed
h) may occur due to a deficiency of hormonal factors

4. Substances that protect cells from the action of free radicals include....

a) tocopherols

b) ferrous iron ions
c) SOD
d) sulfatase
e) peroxidases
f) glucuronidase
g) vitamin A

Situational task

Two monozygotic infant twins admitted to the clinic were found to have an enlarged liver, a decreased level of fasting blood plasma glucose, the glucose level in response to the administration of adrenaline increases slightly, phosphorylase activity in the liver cells is sharply reduced and the glycogen content is increased.

Questions

1. What pathological process developed in the twins?
2. What are the possible causes of this pathological process?
3. What are the mechanisms of formation of this pathological state of hepatocytes?
4. What is the mechanism of occurrence of hepatomegaly, hypoglycemia and the weak hyperglycemic effect of adrenaline?

Class No. 3

1. Topic: Disorders of carbohydrate metabolism. Disorders of lipid metabolism.

2. Goal: - to teach how to conduct a pathophysiological analysis of clinical and model situations associated with carbohydrate metabolism disorders.

- teach how to conduct a pathophysiological analysis of clinical and model situations associated with disorders of lipid metabolism.

3. Learning Objectives

• study the causes and mechanisms of hypo- and hyperglycemic conditions;
• based on the analysis of blood samples or ready-made laboratory data, determine the form of carbohydrate metabolism disorder.
• characterize the main types of lipid metabolism disorders;
• explain the etiology and pathogenesis of the most common manifestations of lipid metabolism disorders.

4. Main questions of the topic

1. Causes and mechanisms of impaired hydrolysis and absorption of carbohydrates.
2. Causes and mechanisms of impaired glucose utilization by cells.
3. Disturbances in the breakdown and absorption of fats in the intestine.
4. Disturbances in the transport of fats and their transition from blood to tissue.
5. Disorders of intermediate fat metabolism.
6. Disorders of fat metabolism in adipose tissue.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study

Practical work

Goal: determine glucose and ketone bodies in the urine of rats with alloxan diabetes.

The experimental animal is injected once subcutaneously with a 5% solution of alloxan at the rate of 15-20 mg/kg body weight. After 48 hours, persistent glycosuria appears due to insular insufficiency. Control and experimental rats are placed in exchange cages, and urine is collected through urinals into separate tubes. Next, 1 ml of urine from each animal is poured into 2 clean separate test tubes and 0.2 ml of Nylander's reagent is added. The contents of the test tubes are boiled for 3 minutes. If there is glucose in the urine, the liquid in the test tubes should turn black. To determine ketone bodies, urine is collected in separate test tubes and 0.25 ml of a previously prepared saturated solution of sodium nitroprusside and 0.5 ml of glacial acetic acid are added. The test tubes

are shaken and a concentrated ammonia solution in an amount of 1 ml is carefully layered along the wall. When acetone is present in urine, a violet ring-shaped layer appears at the interface.
Draw conclusions and conclusions.

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. Causes and mechanisms of impaired hydrolysis and absorption of carbohydrates.
2. Tolerance of body cells to glucose.
3. Causes and mechanisms of impaired glucose utilization by cells.
4. Hyperglycemia, types.
5. Hypoglycemia, causes.
6. Causes of disruption of the breakdown and absorption of fats in the intestines.
7. Types of hyperlipoproteinemia.
8. Types of hyperlipemia.
9. Types of obesity.
10. Causes of cholesterol metabolism disorders.

Tests

1. The course of insulin-dependent diabetes mellitus in children, compared with adults, is characterized by....
A) more severe course
B) absence of diabetic comas
C) impossibility of developing microangiopathies
D) slow progression of the disease
E) more benign course
2. Extrapancreatic insulin deficiency may be a consequence of...
A) tumor lesion of the pancreas
B) increased concentration of proteolytic enzymes in the blood
C) previous pancreatitis
D) circulatory disorders in the area of the islets of Langerhans
E) production of autoantibodies to β- cells of the islets of Langerhans
3. Pancreatic insulin insufficiency develops when...
A) blockade of insulin by antibodies in the blood
B) strong connection of insulin with plasma proteins
C) destruction of β- cells of the islets of Langerhans
D) increased secretion of contrainsular hormones
E) increased insulinase activity.
4. The main symptom of diabetic syndrome is....
A) polyphagia
B) polyuria
C) glucosuria
D) polydipsia
E) hyperglycemia

Situational task

Patient M., 60 years old, was brought to the emergency department in an unconscious state.

Objectively: shallow breathing, respiratory rate – 96/min, blood pressure – 70/50 mm Hg, spasms of the limbs are periodically observed.

In the tests: hyperglycemia 33 mmol/l, hyperazotemia, hypernatremia, pH – 7.32.

Questions

1. What condition has the patient developed?

2. What are the mechanisms of its development?

Class No. 4

1. Topic: Hypoxia. Peripheral circulation disorders.

2. Goal: - to teach how to conduct a pathophysiological analysis of pathological processes associated with the development of hypoxic conditions.

- teach how to conduct pathophysiological analysis of clinical and model situations associated with disorders of organ-tissue circulation and microcirculation.

3. Learning Objectives

• study the mechanisms of development of hypoxia of various natures;

• characterize the mechanisms of emergency and long-term adaptation of the body to hypoxia;

• study the clinical manifestations of peripheral circulatory and microcirculation disorders, and their pathogenesis;

• explain the classification of the main forms of peripheral circulatory and microcirculation disorders.

4. Main questions of the topic

1. Etiopathogenesis of hypoxia.
2. Types of hypoxia.
3. Adaptation to hypoxia.
4. Arterial and venous hyperemia.
5. Ischemia.
6. Thrombosis and embolism.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study

Practical work

Goal: to conduct a pathophysiological analysis of the experimental results.

A laboratory animal (mouse, rat) is placed in a small pressure chamber. Within 2-3 minutes, the air is pumped out from the pressure chamber, lowering the pressure to 170 180 ммHg. (23-24 kPa). After 0.5-1 minutes of being in a rarefied atmosphere, the animal shows signs of anxiety: it moves its paws, scratches its muzzle, runs around the pressure chamber; after another 2-3 minutes, clonic-tonic convulsions and urination occur, the animal lies on its side, rare deep "sighs" occur (terminal breathing "gasping"). Soon a complete stop of breathing occurs and the animal dies. Its lifespan in a rarefied atmosphere is therefore 3-4 minutes.

Questions

1. What pathogenic factors was the animal exposed to in this experiment?
2. Which of these factors could be the cause of the developed pathological process (hypobaric hypoxia)?
3. How can the assumptions made be experimentally verified?

Practical work

Goal: to reproduce arterial and venous hyperemia in a frog.

The immobilized frog is placed on the board with its belly up so that its right side in its middle third is positioned above the round hole of the board. Using scissors, the skin, muscles and peritoneum are cut layer by layer on the lateral line of the abdomen on the right in the middle and lower third. From the opened abdominal cavity, carefully, without injuring the internal organs, a loop of the small intestine is removed, the mesentery of which is straightened over the side opening of the board, securing it with pins. When preparing a mesentery preparation, care must be taken to ensure that the intestinal loop is not twisted. The prepared preparation is examined under a microscope, and the picture of normal blood flow in the vessels is studied under low magnification. In this case, attention is paid to the size of the lumen of the vessels, the number of functioning capillaries, and the speed of blood flow in them. Describe changes characteristic of arterial and venous hyperemia.

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. General characteristics of hypoxia as a typical pathological process.
2. Criteria for the classification of hypoxic conditions and the main types of hypoxia.
3. Clinical and pathophysiological characteristics of the main types of hypoxia.
4. Metabolic, morphological and functional disorders in the body under conditions of acute hypoxic condition.
5. Mechanisms of compensation and adaptation in the body during hypoxia.
6. Forms of peripheral circulation and microcirculation disorders.
7. Mechanisms of vasoconstriction, vasodilation.
8. Mechanisms of compression and recirculatory ischemia.
9. Mechanisms of arterial and venous congestion.
10. Thrombosis. Thromboembolism.

Tests

1.... reactivity refers to the stronger effect of hypoxia on adults than on newborns.
A) age
B) species
C) biological
D) sexual
E) individual
2. Hypoxia is....
A) pathological reaction
B) pathological condition
C) typical pathological process
D) illness
E) symptom complex
3. Hypoxia, which develops when the partial pressure of oxygen in the inhaled air decreases, is called....
A) circulatory
B) exogenous
C) tissue
D) hemic
E) endogenous
4. Exogenous normobaric hypoxia occurs when....
A) being in an unventilated area
B) by increasing barometric pressure
C) decrease in barometric pressure
D) increase 0_2 in the air
E) climbing the mountains

Situational task

A 56-year-old man complains of rapid fatigue and pain in the calf muscles when walking, which ceases after stopping, chilliness of the legs, and a feeling of numbness.

On examination: the feet are pale, the skin on them is dry, cold, the nails are crumbling, the pulse in the dorsal artery of the foot on both limbs cannot be felt.

Questions

1. What form of regional circulatory disorder does the patient have?
2. What are the mechanisms of its development in this patient?
3. What are the possible adverse effects of the patient's circulatory disorders?

Class No. 5

1. Topic: Disorders of water and electrolyte metabolism.

2. Goal: to teach how to conduct a pathophysiological analysis of clinical and model situations associated with disorders of water and electrolyte metabolism.

3. Learning Objectives

• study violations of the mechanisms regulating the exchange of water and electrolytes;

• characterize the main types of violations of the external water balance and distribution of water in the internal environments of the body;

• explain the etiology and pathogenesis of the most common manifestations of dyshydria.

4. Main questions of the topic

1. Reasons for violation of the external water balance and distribution of water in the internal environments of the body.
2. Etiology and pathogenesis of the main forms of water-electrolyte balance disorders.
3. Metabolic and functional changes in the body due to disturbances in the exchange of water and electrolytes.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study

Practical work

Goal: to study the influence of the pharmacological effects of different doses of catecholamines on the hemodynamics of a laboratory rat.

The rat was intravenously injected with a 0.1% solution of adrenaline at the rate of 0.004 ml per 1 rbody weight. Immediately after the administration of adrenaline, the skin and mucous membranes turned pale, blood pressure increased from 120/70 to 210/175 mm Hg, pronounced tachycardia with extrasystole appeared, breathing became more frequent, $p_a O_2$ remained unchanged, $p_{at} CO_2$ decreased. However, after 12 minutes, against the background of hyperventilation, the skin acquired a gray color, the gas composition of arterial blood did not change significantly, and an increasing decrease in $p_y O_2$ was noted. in the next 3-4 minutes, signs of external respiration disturbance developed, which became irregular, severe, with the appearance of moist rales on exhalation, blood pressure decreased, pulse pressure decreased, and arrhythmia occurred. At the same time, paO2 began to decrease, and paCO2 began to increase. By the end of 20 minutes, clonicotonic convulsions, atonal breathing developed, and foamy discharge appeared from the mouth and nose. The animal died.

Draw conclusions by answering the following questions:

1. What are the likely causes of the animal's death?
2. What signs indicate the development of pulmonary edema?
3. What is the pathogenesis of acute pulmonary edema in this experiment?

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. Reasons for violation of the external water balance and distribution of water in the internal environments of the body.
2. Starling's law and pathogenetic factors of edema formation.
3. Causes, basic mechanisms and manifestations of disturbances in the content of $Na^{+,}$ $K^{+,}$ $Ca^{2+,}$ Mg^{2+} ions in the internal environments of the body.
4. Etiology and pathogenesis of the main forms of water-electrolyte balance disorders.
5. Metabolic and functional changes in the body due to disturbances in the exchange of water and electrolytes.

Tests

1. Dehydration occurs in the following cases:

A) hyposalivation.

B) oliguria.
C) decreased sweating.
D) chronic blood loss.
E) hyperventilation syndrome in children.
2. Edema is....
A) increase in intracellular fluid
B) accumulation of fluid in serous cavities
C) increased lymph production
D) increase in intravascular fluid
E) accumulation of fluid in tissues and interstitial space
3. The development of edema is promoted by....
A) increased production of ADH and aldosterone
B) increased blood albumin levels
C) enhanced drainage of the interstitium and lymph vessels
D) decreased production of antidiuretic hormone
E) reduced permeability of the vascular wall
4. The main pathogenetic factor of cardiac edema is....
A) increased venous pressure
B) increase in colloid osmotic pressure in tissues
C) increased permeability of the vascular wall
D) decrease in blood oncotic pressure
E) decreased lymph flow

Situational task

Patient Z., 40 years old, complains of shortness of breath and pain in the right hypochondrium.

Objectively: the face is pale and puffy. Expansion of the borders of the heart to the left and right by 2 cm, heart rate 100/min, muffled heart sounds, Good rales in the lungs, RR 26 per minute, swollen veins of the neck, liver protrudes 3 cm from under the edge of the costal arch, pasty legs.

X-ray of the chest organs: a spherical shadow of the heart.

Questions
1. What condition has the patient developed?
2. What are the mechanisms of its development in this patient?

Class No. 6

1. Topic: Inflammation.

2. Goal: to teach how to conduct a pathophysiological analysis of clinical and model situations, the basis of which is the inflammatory process.

3. Learning Objectives

- study the main components of the pathogenesis of the inflammatory process;
- explain the classification of phlogogenic factors.

4. Main questions of the topic

1. Etiology of inflammation.
2. Pathogenesis of inflammation.
3. Biological significance of inflammation.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case study.

Practical work

Goal: to determine the main signs of inflammation.

At the very beginning of the class, the intact rabbit ear is immersed in water heated to 55° C for 30 s. During the class, the stages of development of an acute inflammatory reaction with its characteristic signs are periodically observed.

Draw conclusions by answering the following questions:

1) What external signs of inflammation and in what sequence were observed in this experiment?
2) What are the mechanisms of development of each of these characteristics?

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. Characteristics of the concept of "inflammation".
2. Etiology of inflammation. Classification of phlogogenic factors.
3. Pathogenesis of inflammation, its main components.
4. Alteration as a triggering factor for inflammation.
5. Inflammatory mediators, their role in the inflammatory process.
6. Physico-chemical phenomena at the site of inflammation.
7. Vascular reactions at the site of inflammation.
8. Exudation and release of blood cells from the vascular bed.
9. Characteristics of the exudation process.
10. Stages and mechanisms of leukocyte emigration to the site of inflammation.
11. Phagocytic reaction during inflammation.
12. Features of the pathogenesis of acute and chronic inflammation.
13. Biological significance of inflammation.

Tests

1. High permeability of histohematological barriers in young children contributes to….

A) generalization of infectious and inflammatory processes
B) penetration of microorganisms and toxins into tissues
C) inhibition of autoimmune organ damage
D) tumor development
E) the emergence of the body's reactivity to all antigens

2. The most common cause of inflammation is... factors.

A) chemical
B) biological
C) physical
D) mechanical
E) thermal

3. The components of inflammation include....

A) acidosis, hyperosmia, hyperonkia of the inflammation focus
B) arterial hyperemia, venous hyperemia, stasis
C) alteration, circulatory disorders with exudation, proliferation
E) swelling, redness, dysfunction, pain, local increase in temperature of the inflammation site
E) leukocytosis, increased ESR, increased body temperature

4. The first stage of inflammation is...

A) alteration
B) emigration of leukocytes
C) phagocytosis
D) exudation
E) proliferation

Situational task

Two workers who received burns to their legs in an autoclave accident came to the enterprise's medical center. They presented similar complaints of headache, burning pain and swelling at the burn sites. On examination: the patient A.'s legs are hyperemic, their skin is swollen; in the patient B. (in addition to hyperemia and swelling of the skin), vesicles filled with a transparent light yellow liquid were found. Both patients received sick leave and treatment recommendations, but did not follow them.

After 3 days, the condition of the patient A. returned to normal. The condition of the patient B. worsened significantly: widespread swelling developed and pain in the burned areas intensified; Numerous blisters with purulent contents appeared in the burn area (during its bacteriological examination, Staphylococcus aureus was found); body temperature 38.9 °C.

Questions

1. What pathological processes developed in the patients?
2. What are the reasons for the different course of pathological processes caused by the same factor?
3. What are the mechanisms of development of symptoms in the patient B.?

Class No. 7

1. Topic: Allergy.

2. Goal: to teach how to conduct pathophysiological analysis of clinical and model situations associated with the development of allergic reactions.

3. Learning Objectives

- study the causes and mechanisms of development of allergic reactions;
- study the classification of allergic reactions;
- characterize the principles of identifying allergies of immediate and delayed types.

4. Main questions of the topic

1. Allergy, concept.
2. Types of allergic reactions.
3. The concept of allergens.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study;

Practical work

Goal: to investigate the manifestations and analyze the mechanisms of development of the Arthus phenomenon.

20-30 days before the class, the rabbit is injected sterilely under the skin with the same normal horse serum in a volume of 3-5 ml 5 times at intervals of 5-6 days. The rabbit is demonstrated during a period of pronounced changes in the skin, characteristic of the Arthus phenomenon. The localization, doses and time intervals of serum administration, the latent period of manifestation of pathological changes in the skin after serum administration are determined. The location, nature and severity of tissue damage, the reaction of the surrounding skin, the presence of swelling and pain are determined.

Draw conclusions by answering the following questions:

1. What type of allergic reactions is the Arthus phenomenon?
2. What factors are most important in the development of skin damage in Arthus phenomenon?

6. Assessment methods/technologies: Checklist

7. Literature: see Appendix No. 1.

8. Control

Questions

1. Allergy, concept, general characteristics.
2. Types of allergic reactions, classification, their characteristics.
3. The concept of allergens. Sensitization.
4. Immediate type allergy, sensitization mechanism.
5. Allergy of the slow type, mechanism of sensitization.

6. The concept of autoallergic conditions of the body.

Tests

1. In young children,… is more common.
A) food allergy
B) infectious form of allergy
C) drug allergy
D) inhalation allergy
E) household allergies

2. In the base of the classification of allergic reactions according to P. Gell and R. Coombs lies...
A) pathogenesis of allergic reactions
C) time of appearance of clinical manifestations of allergic reactions
C) etiology of allergic reactions
D) severity of allergic reactions
E) the nature of clinical manifestations

3. The pathophysiological stage of allergic reactions is characterized by....
A) disruption of the structure and functions of organs and tissues under the influence of biologically active substances
C) the influence of biologically active substances
C) formation of immune complexes
D) formation of antibodies
E) the formation of sensibilized lymphocytes

4. Immunoglobulins of the class... take part in the development of allergic reactions of the reagin type .
A) E
B) M
C) A
D) C
E) D

Situational task

20 minutes after the injection of the antibiotic to a patient with phlegmon of the leg, he developed anxiety, a feeling of fear, redness of the face, blood pressure 180/90 mm Hg. After another 20 minutes, the patient's condition sharply worsened: weakness, confusion, convulsions appeared, blood pressure was 75/55 mm Hg.

Questions

1. What condition has the patient developed?
2. What are the treatment options for this condition?

Class No. 8

1. Topic: Tumors

2. Goal: to teach how to conduct a pathophysiological analysis of situations related to the development of tumors;

3. Learning Objectives

- study the pathogenetic links of carcinogenesis;
- characterize malignant and benign tumors;
- explain the mechanism of transformation of a normal cell into a tumor cell.

4. Main questions of the topic

1. Etiology of tumor growth.
2. Pathogenetic mechanisms of carcinogenesis.
3. Mechanisms of antitumor defense of the body.

5. Methods/technologies of learning and teaching: Work in small groups, discussion of the topic, case - study;
6. Assessment methods/technologies: Checklist.
7. Literature: see Appendix No. 1.
8. Control
Questions
1. Cyto- and histodifferentiation.
2. Etiology of tumor growth.
3. Pathogenetic mechanisms of carcinogenesis.
4. Mechanisms of blast transformation of somatic cells.
5. Atypia of transformed cells.
6. Mechanisms of tumor progression.
7. Pathways of tumor expansion.
8. Relationship between the body and the tumor.
9. Mechanisms of antitumor defense of the body.

Tests
1. Basic causes of tumors at children:
A) decrease in partial pressure of oxygen
B) ionizing radiation
C) occupational hazards
D) chronic inflammatory processes
E) chemicals
2. The second stage of carcinogenesis is called….
A) initiation
B) syncarcinogenesis
C) promotion
D) procarcinogenesis
E) cocarcinogenesis
3. Endogenous chemical carcinogens include....
A) aromatic hydrocarbons
B) oxygen free radicals and nitric oxide
C) nitrosamines
D) a minoazo compounds
E) simple chemical compounds
4. Simplification of the chemical composition of tumor tissue is called....
A) dysplasia
B) complication
C) convergence
D) hypertrophy
E) anaplasia

Situational task

Patient Yu., after physical activity, suddenly developed a feeling of fear, dizziness, and tachycardia. Blood pressure 270/165 mm Hg. Ultrasound and X-ray examination of the adrenal glands revealed a brain tumor – pheochromocytoma.

Questions
1. What tumors does pheochromocytoma belong to?
2. What is the cause of pain?

Check list

Work in small groups (doing practical work)	Excellent corresponds to points 95-100 90-94	- completed the practical work in a timely manner and without any errors and submitted a report on it; - took an active part in the discussion research results; - did the right thing conclusion, showed original thinking
	Good corresponds to points 85-89 80-84 75-79 70-74	- completed the practical work in a timely manner and submitted a report on it, allowing unprincipled errors; - took an active part in discussing the research results
	Satisfactorily corresponds to points 65-69 60-64 50-54	- completed the practical work in a timely manner and submitted a report on it, allowing fundamental errors; - was not active during the discussion, needed help teacher
	Unsatisfactory corresponds to points 25-49	- failed to submit a report on time practical work, made serious mistakes, did not complete all the practical work, provided for by the program; - did not participate in the discussion of the results of the work
	Unsatisfactory corresponds to points 0-24	
Case - study	Excellent corresponds to points 95-100 90-94	- solved cases within a certain time; - gave complete answers to all questions
	Good corresponds to points 85-89 80-84 75-79 70-74	- solved cases within a certain time; - gave complete answers to all questions; - when solving cases made unprincipled mistakes
	Satisfactorily corresponds to points 65-69 60-64 50-54	- solved cases within a certain time; - gave incomplete answers to questions; - made fundamental mistakes when solving cases
	Unsatisfactory corresponds to points 25-49	- solved the cases incorrectly or did not solve them at all; - made serious mistakes when solving cases
	Unsatisfactory corresponds to points 0-24	
Work in small groups (interpretation of the results of clinical and laboratory studies)	Excellent corresponds to points 95-100 90-94	- correctly, without any errors, interpreted the results of clinical and laboratory studies; - made a reasonable conclusion
	Good corresponds to points 85-89 80-84	- correctly interpreted the results of clinical and laboratory studies, making unprincipled errors; - made a reasonable conclusion

	75-79 70-74	
	Satisfactorily corresponds to points 65-69 60-64 50-54	- correctly interpreted the results of clinical and laboratory studies, making fundamental errors; - made an unfounded conclusion
	Unsatisfactory corresponds to points 25-49	- incorrectly interpreted the results of clinical and laboratory studies, making gross mistakes; - did not make a conclusion
	Unsatisfactory corresponds to points 0-24	
Discussion of the topic	Excellent corresponds to points 95-100 90-94	- did not make any mistakes during the discussion; - was oriented in the theories, concepts and directions of general pathology and gave them a critical assessment; - used scientific achievements of other disciplines
	Good corresponds to points 85-89 80-84 75-79 70-74	- during the discussion he did not make gross mistakes, but made inaccuracies and unprincipled errors, which he corrected himself; - managed systematize program material with the help of a teacher
	Satisfactorily corresponds to points 65-69 60-64 50-54	- made fundamental mistakes during the discussion; - limited himself only to educational literature indicated by the teacher; - experienced great difficulties in systematizing the material
	Unsatisfactory corresponds to points 25-49	- made serious mistakes during the discussion; - did not study the basic literature on the topic of the Class; - failed to use the scientific terminology of general pathology
	Unsatisfactory corresponds to points 0-24	

Appendix No. 1