BIOLOGICAL CHEMISTRY. THE BANK OF MCQ TEST QUESTIONS

(GENERAL MEDICINE)

Module № 3

IV. Metabolism of lipids.

Lesson 18

Theme: Lipid structure, function, digestion and absorption.

1. A patient complains of frequent diarrheas, especially after consumption of the food riched whis fats, weight loss. Laboratory examination revealed steatorrhea, his feces were hypocholic. What might have caused such condition?
   A. Unbalanced diet
   B. Obturation of biliary dacts
   C. Lack of pancreatic lipase
   D. Lack of pancreatic phospholipase
   E. Inflammation of mucous membrane of small intestine.
2. The treatment of a child, who suffers from ricket, with vitamin D_3 proved to be unsuccessful. Which is the most likely cause of treatment inefficiency?
   A. Insufficiency of lipids in food
   B. Disturbance of hydroxylation of vitamin D
   C. Disturbance of insertion of vitamin D_3 into the molecule of enzyme
   D. Increased consumption of vitamin D by microorganisms of intestines
   E. Disturbance of vitamin D transport by the proteins of blood.
3. After the consumption of animal food rich in fats, a patient feels discomfort, and droplets of fats are found during laboratory investigation of his feces. The cause of such state is the deficiency of ... in the digestive tract.
   A. Phospholipids
   B. Fatty acids
   C. Chylomicrons
   D. Triacylglycerols
   E. Bile acids.
4. After the consumption of a diet rich in fats, a patient complains of languor and nausea. Later signs of steatorrea appear. The level of blood cholesterol makes 9.2 mM/1. The shortage of what substances causes this state of a patient?
   A. Fatty acids
   B. Triacylglycerols
   C. Bile acids
   D. Phospholipids
   E. Chylomicrons.
5. Arachidonic acid, an essential component of a human diet, acts as a precursor of the vitally important physiologically active biomolecules. Which substances are synthesized from arachidonic acid?
   A. Ethanolamine
   B. Choline
   C. Noradrenaline
   D. Prostaglandin E_1
   E. Triiodothyronine.
6. Laboratory investigation of the patient's blood plasma, which was performed 4 hours after a consumption of a fat diet, displayed a marked increase of plasma turbidity. The most credible cause of this phenomenon is the increase of ….. in the plasma.
   A. HDL
   B. Chylomicrons
   C. LDL
   D. Cholesterol
   E. Phospholipids.
7. The insufficient secretion of what enzyme is the cause of incomplete fats degradation in the digestive tract and appearance of great quantity of neutral fats in feces?
   A. Pepsin
   B. Phospholipase
   C. Enterokinase
   D. Amylase
   E. Pancreatic lipase.
8. A coprological survey revealed light-colored feces containing drops of neutral fat. The most likely reason for this condition is the disorder of:
   A. Bile inflow into the bowel
   B. Pancreatic juice secretion
   C. Intestinal juice secretion
   D. Intestinal absorption
   E. Gastric juice acidity.
9. Examination of a patient suffering from chronic hepatitis revealed a significant decrease in the synthesis and secretion of bile acids. What process will be mainly disturbed in the patient's bowels?
   A. Glycerin absorption
   B. Fat emulsification
   C. Protein digestion
   D. Carbohydrate digestion
   E. Amino acid absorption.
10. After consumption of rich food a patient has nausea and heartburn, steatorrhea. This condition might be caused by:
   A. Disturbed phospholipase synthesis
   B. Increased lipase secretion

C. Amylase deficiency
D. Bile acid deficiency
E. Disturbed tripsin synthesis.

11. Point out the saturated fatty acid:
A. Palmitic
B. Linolenic
C. Oleic
D. Linolic
E. Arachidonic.

12. Point out the monounsaturated fatty acid:
A. Palmitic acid
B. Stearic acid
C. Linoleic acid
D. Oleic acid
E. Linolinic acid.

13. Lipids are natural organic compounds, which are:
A. Good soluble in water
B. Insoluble in organic solvents
C. Insoluble in benzene
D. Soluble in organic solvents
E. Soluble in buffer solutions.

14. Choose the substances, which are precursors of prostaglandins:
A. Carbohydrates;
B. Proteins
C. Saturated fatty acids
D. Monounsaturated fatty acids
E. Polyunsaturated fatty acids.

15. Point out the place of lipids' products' absorption in gastrointestinal tract:
A. Duodenum
B. Small intestine
C. Stomach
D. Esophagus
E. Bottom parts of intestine.

16. Point out the end product of lipids' digestion, which can absorb more intensively than others:
A. Bile acids
B. Long chain fatty acids
C. Cholesterol
D. Monoglyceride
E. Triacylglycerides.

17. Where is the digestion of fats started?
A. In mouth
B. In stomach
C. In duodenum
D. In small intestine
E. In liver.

18. Triacylglycerols are digested by:
A. Lipase
B. Proteinase
C. Amilase
D. Phospholipase
E. Trypsin.

19. Which is the optimal pH for lipase activity?
A. 7-8
B. 1,2-2
C. 6-7
D. 9-10.

20. The form in which dietary lipids are packaged and exported from the intestinal mucosal cells is:
A. Free fatty acids
B. Free triacylglycerol
C. Monoacylglycerol
D. Chylomicrons
E. High-dencitiy lipoproteins (HDL).

21. Arachidonic acid, an essential component of a human diet, acts as a precursor of the vitally important physiologically active biomolecules. Which substances are synthesized from arachidonic acid?
A. Ethanolamine
B. Choline
C. Noradrenaline
D. Prostacyclines
E. Triiodothyronine.

Lesson 19

Theme: Catabolism of triacylglycerols. Oxidation of fatty acids and glycerol.

1. Emotional stress causes activation of hormon-sensitive triglyceride lipase in the adipocytes. What secondary mediator takes part in this process?
A. Diacylglycerol
B. Ions of Ca^{2+}
C. Cyclic guanosine monophosphate
D. Cyclic adenosine monophosphate
E. Adenosine monophosphate

2. A sportsman needs to improve his sporting results. He was recommended to take a preparation that contains carnitine. What process is activated the most by this compound?
A. Vitamin K transporting
B. Glucose transporting
C. Fatty acids transporting
D. Amino acids transporting
E. Calcium ions transporting

3. The essence of lipolysis, that is the mobilization of fatty acids from neutral fats depots, is an enzymatic process of hydrolysis of triacylglycerols to fatty acids and glycerol. Fatty acids that released during this process enter blood circulation and are transported as the components with:
A. LDL
B. Globulins

C. HDL
D. Serum albumins
E. Chylomicrons.

4. A 35-year-old man with pheochromocytoma has high levels of epinephrine and norepinephrine registered in the blood. The concentration of free fatty acids is increased by a factor of eleven. Which of the following enzymes accelerates the lipolysis under the action of epinephrine?
A. Triacylglycerol lipase
B. Lypoprotein lipase
C. Phospholipase A_1
D. Phospholipase C
E. Cholesterol esterase.

5. Aerobic oxidation of substrates is typical for cardiac muscle. Which of the following is the major substrate for oxidation in a cardiac muscle?
A. Fatty acids
B. Triacylglycerols
C. Glycerol
D. Glucose
E. Amino acids.

6. Carnitine is recommended to a sportsman as a preparation that increases physical activity and improves achievements. What biochemical process is mostly activated under the action of carnitine?
A. Transport of fatty acids into mitochondria
B. Ketone bodies synthesis
C. Lipids synthesis
D. Tissue respiration
E. Steroid hormones synthesis.

7. A 1-year-old baby has been hospitalised for body and limbs lesions. Examination revealed carnitine deficiency in the child's muscles. A biochemical reason for this pathology is the disorder of:
A. Substrate-linked phosphorylation
B. Transport of fatty acids to mitochondria
C. Utilization of lactic acid
D. Oxidative phosphorylation
E. Regulation of Ca^{2+} rate in mitochondria.

8. A patient with high rate of obesity was advised to use carnitine as a food additive in order to enhance "fat burning". What is the role of carnitine in the process of fat oxidation?
A. FFA activation (free fatty acids)
B. Activation of intracellular lipolysis
C. Transport of FFA from cytosol to the mitochondria
D. Transport of FFA from fat depots to the tissues
E. It takes part in one of reactions of FFA beta-oxidation.

9. Point out the regulatory enzyme of tissue lipolysis:
A. Diglyceride lipase
B. Monoglyceride lipase
C. Triglyceride lipase
D. Phospholipase A_1
E. Phospholipase D.

10. Point out the biological role of carnitine in cells:
A. Antioxidant
B. Allosteric activator of enzymes
C. Transporter of acyl ~ SCoA through the mitochondria membranes
D. The participant of a respiratory chain
E. The enzyme inhibitor.

11. Point out, how fatty acids are activated in catabolic process:
A. Are phosphorylated by ATP
B. Don't change the structure
C. Form acyl-SCoA due to ATP energy
D. Condense with HS-CoA without any energy
E. Interact with carnitine.

12. Choose the enzyme, which takes part only in the β-oxidation of unsaturated fatty acids:
A. Acyl-CoA dehydrogenase
B. Enoyl-CoA hydratase
C. 3,4-cis-2,3-trans-acyl-CoA-isomerase
D. 3-oxyacyl-CoA dehydrogenase
E. Thiolase.

13. Choose the lipolytic enzyme, whose activity depends upon the adrenalin level in the blood:
A. Protein kinase
B. Adenylate cyclase
C. Triglyceride lipase
D. Diglyceride lipase
E. Monoglyceride lipase.

14. What is the number of ATP produced during each turn of β-oxidation of fatty acids:
A. 2
B. 3
C. 5
D. 8
E. 10.

15. What is the number of ATP produced by the oxidation of palmitic acid to CO_2 and H_2O?
A. 40
B. 70
C. 100
D. 130
E. 160.

16. What is the number of ATP produced by the oxidation of glycerol to CO_2 and H_2O?

A. 10
B. 12
C. 16
D. 21
E. 36.

17. Point the energy effect (in ATP quantity) after oleic acid β-oxidation (up to CO_2 and H_2O):
A. 145
B. 148
C. 20
D. 220
E. 120.

18. Point out the end product of β-oxidation of fatty acids with odd number of carbon atoms:
A. Acetoacetyl ~ SCoA
B. Malonyl – SCoA
C. Butiryl – SCoA
D. Propionyl ~ SCoA
E. Succynil ~ SCoA.

19. What tissue can convert glycerol to glucose:
A. Adipose tissue
B. Liver
C. Muscle
D. Connective tissue
E. Nerve tissue.

20. How does adrenalin influence the activity of triglyceride lipase under the emotional stress?
A) Doesn't influence the lipase activity
B) Activates lipase directly
C) Activates protein kinase (thanks to cAMP), which phosphorylates the lipase
D) Inhibits lipase due to cAMP
E) Inhibits lipase directly.

Lesson 20

<u>Theme:</u> Biosynthesis of fatty acids and triacylglycerols.

1. In a human body the adipose tissue is the basic location of triacylglycerols (TAG) deposit. At the same time their synthesis takes place in hepatocytes. In the form of what molecular complexes TAG transported from the liver into the adipose tissue?
A. Chylomicrons.
B. VLDL.
C. LDL.
D. HDL.
E. Complexes with albumin.

2. An experimental animal has been given excessive amount of carbon-labeled glucose for a week. What compound can the label-carbon be found in?
A. Palmitic acid
B. Methionine
C. Vitamin A
D. Choline
E. Arachidonic acid.

3. Which of the following effect of insulin is correct?
A. Activates the oxidation of fatty acids
B. Activates the lipolysis
C. Inhibits the synthesis of lipids
D. Enhances the synthesis of lipids.
E. Activates transport of FFA from fat depots to the tissues.

4. Where in the cell the process of fatty acids synthesis take place?
A. In mitochondria
B. In cytoplasm
C. In lysosomes
D. In endoplasmatic reticulum
E. In the nucleus.

5. In most organisms the end product of the fatty-acid synthetic system is:
A. Palmitic acid
B. Arachidonic acid
C. Linoic acid
D. Linolenic acid
E. Stearic acid.

6. Choose the bodies and tissues where lipogenesis occurs most intensively:
A. Muscle
B. Brain
C. Liver, mammary glands
D. Kidneys
E. Myocardium.

7. Point out the process, which is the supplier of NADPH in the fatty acids synthesis:
A. Gluconeogenesis
B. Pentose phosphate pathway
C. β-Oxidation of fatty acids
D. Glycolysis
E. Glycogenolysis.

8. Which one of the following fatty acids is not synthesized in humans?
A. Oleic
B. Linoleic
C. Palmitic
D. Stearic
E. Butyric.

9. Some individuals with active brown adipose tissue do not become obese despite overeating, since whatever they eat is not stored as fats. What biochemical basis of that?
A. Inactive lipoprotein lipase
B. Deficiency of chylomicrons
C. Low activity of carnitine

acyltransferase 1(CAT1)

D; Inhibition of oxidative phosphorylation in the mitochondria

E. Uncoupling of oxidation and phosphorylation in the mitochondria.

10. A protein, produced by the adipose tissue in mice has been identified. Injection of this protein to obese mice caused reduction in body fat, increased metabolic rate and increased insulin concentration, besides reduced food intake. It has also been detected in humans. What protein it is?

A. Leptin
B. Troponine
C. Actin
D. Titine
E. Dystrophine.

Lesson 21

Theme: Metabolism of phospholipids and glycolipids.

1. Synthesis of phospholipids is disturbed as a result fatty infiltration of liver. Indicate which of the following substances can enhance the process of methylation during phospholipids synthesis?

A. Glycerin
B. Citrate
C. Ascorbic acid
D. Methionine
E. Glucose.

2. Under fatty infiltration of the liver the synthesis of phospholipids is disturbed. Which substance from the listed below can stimulate processes of methylation in the synthesis of phospholipids?

A. Methionine
B. Ascorbic acid
C. Glucose
D. Glycerol
E. Citrate.

3. A diet enriched with lipotropic substances is recommended to a 65-year-old patient with signs of total obesity and fatty dystrophy of the liver. Which substances from the listed below are lipotropic?

A. Vitamin C
B. Cholesterol
C. Glucose
D. Methionine
E. Glycine.

4. In a human body the adipose tissue is the basic location of triacylglycerols (TAG) deposit. At the same time their synthesis takes place in hepatocytes. In the form of what molecular complexes TAG transported from the liver into the adipose tissue?

A. Chylomicrons
B. VLDL
C. LDL
D. HDL
E. Complexes with albumin.

5. A 6 year old child was delivered to a hospital. Examination revealed that the child couldn't fix his eyes, didn't keep his eyes on toys, eye ground had the cherry-red spot sign. Laboratory analyses showed that brain, liver and spleen had high rate of ganglioside glycometide. What congenital disease is the child ill with?

A. Tay-Sachs disease
B. Turner's syndrome
C. Wilson's syndrome
D. Niemann-Pick disease
E. MacArdle disease.

6. An experimantal animal that was kept on protein-free diet developed fatty liver infiltration, in particular as a result of deficiency of methylating agents. This is caused by disturbed generation of the following metabolite:

A. Acetoacetate
B. Cholesterol
C. DOPA
D. Choline

7. Atherogenic factors that have a lot of cholesterol are:

A. HDL
B. VLDL
C. LDL
D. IDL
E. Chylomicrons.

8. A fatty degeneration in liver is prevented by the lipotropic substances. Which of the folloving behaves like them:

A. Choline
B. Glucose
C. Glycerol
D. Cholesterol
E. Glycine.

9. Some phospholipids have specialized functions in human body. Which of them is a major component of lung surfactant?

A. Dipalmitoyl lecithin
B. Phosphatidylserin
C. Phosphatidylinositol
D. Lysophosphatidate
E. Phosphatidate.

10. Deficiency of lung surfactant in the lungs of many preterm newborns gives rise to respiratory distress syndrome. Surfactant activity is largely attributed to the presence of some phospholipids

in it structure:

A. Lysophosphatidate
B. Phosphatidylserin
C. Phosphatidylinositol
D. Dipalmitoyl lecithin
E. Phosphatidate.

11. An infant, born at 28 weeks of gestation, rapidly gave evidence of respiratory distress. Lab and x-ray results supported the diagnosis of infant respiratory distress syndrome (RDS). Which of the following statements about this syndrome is true?

A. Is unrelated to the baby's premature birth

B. Is a consequence of too few type II pneumocytes

C. The L/S ratio (the ratio of Lecithin to Sphingomyelin) in the amniotic fluid is likely to be greater than two

D. The concentration of dipalmitoylphosphatidyl-choline in the amniotic fluid would be expected to be lower than that of a full-term baby

E. RDS is an easily treated with low mortality.

12. A 25-year-old woman with a history that included hepatosplenomegaly with eventual removal of the spleen, bone and joint pain with several fractures of the femur, and a liver biopsy that showed wrinkled-looking cells with accumulations of glucosylceramides. The likely diagnosis for this patient is?

A. Fabry disease
B. Farber disease
C. Gaucher disease
D. Krabbe disease
E. Niemann-Pick disease.

Lesson 22.

<u>Theme:</u> Cholesterol metabolism.

1. The normal content of cholesterol in blood is:

A. 5-10 mmol/l
B. 10-15 mmol/l
C. 3-9 mmol/l
D. 1-4 mmol/l
E. 3-5.5 mmol/l.

2. Point out the most aterogenic lipoprotein of the blood:

A. HDL
B. VLDL
C. LDL
D. IDL
E. Chylomicrons.

3. On the initial stages of cholesterol synthesis from acetyl-CoA arises:

A. Malonic acid
B. Stearic acid
C. Mevalonic acid
D. Oleic acid
E. Lactic acid.

4. Cholesterol executes in the organism all of the folloving functions, **<u>except</u>**:

A) Component of cell membrane
B) Substrate for the synthesis of bile acids
C) Substrate for the synthesis of vit. D_3
D) Substrate for the synthesis of steroid hormones
E) An energy source.

5. Cholesterol has the folloving functional chemical group:

A) Carboxylic;
B) Amino;
C) Hydroxyl;
D) Carbonyl;
E) Ester.

6. A patient suffers from arterial hypertension due to atherosclerotic injury of blood vessels. The consumption of what dietary lipid needs to be limited?

A. Lecithine
B. Oleic acid
C. Cholesterol
D. Monooleateglycerol
E. Phosphatidylserine.

7. Laboratory investigation of a patient revealed a high level of plasma LDL. What disease can be diagnosed?

A. Gastritis
B. Nephropathy
C. Acute pancreatitis
D. Atherosclerosis
E. Pneumonia.

8. Clinical signs and laboratory testing of a patient allow to make the assumption of gall-bladder inflammation, colloid properties of bile disorder, the occurrence of gall-stones. Which substances can underlie the formation of gall-stones?

A. Oxalates
B. Urates
C. Cholesterol
D. Chlorides
E. Phosphates.

9. A 58-year-old patient suffers from the cerebral atherosclerosis. Examination revealed hyperlipoidemia. What class of lipoproteins will most probably show increase in concentration in

this patient's blood serum?

A. Fatty acid complexes with albumins
B. Very low density lipoproteins
C. Chylomicrons
D. Low density lipoproteins
E. High density lipoproteins.

10. A young girl with a history of severe abdominal pain was taken to her local hospital at 5 a.m. in severe distress. Blood was drawn, and the plasma appeared milky, with the triacylglycerol level in excess of 2000 (normal = 4-150 mg/dl). The patient was placed on a diet severely limited in fat, but supplemented with medium-chain length fatty acids. Which of the following lipoprotein particles are most likely responsible for the milky appearance of the patient's plasma?

A. Chylomicrons
B. Very-low-density lipoproteins
C. Intermediate-density lipoproteins
D. Low density-lipoproteins
E. High density-lipoproteins.

11. A 70 year old man is ill with vascular atherosclerosis of lower extremities and coronary heart disease. Examination revealed disturbance of lipid blood composition. The main pathogenic factor of atherosclerosis development is the excess of the following lipoproteins:

A. Low-density lipoproteins
B. Intermediate density lipoproteins
C. Cholesterol
D. High-density lipoproteins
E. Chylomicrons.

12. A young girl with a history of severe abdominal pain was taken to her local hospital at 5 a.m. in severe distress. Blood was drawn, and the plasma appeared milky, with the triacylglycerol level in excess of 2000 (normal = 4-150 mg/dl). The patient was placed on a diet severely limited in fat, but supplemented with medium-chain length fatty acids. Medium-chain length fatty acids are given because they:

A. Are more calorically dense than long-chain fatty acids
B. Enter directly into the portal blood, and can be metabolized by the liver
C. Are activators of lipoprotein lipase
D. Are more efficiently packed into serum lipoproteins
E. Can be converted into a variety of gluconeogenic precursors.

13. A 35-year-old woman was seen in the emergency room because of recurrent abdominal pain. The history revealed a two-year pattern of pain in the upper right quadrant, beginning several hours after the ingestion of a meal rich in fried/fatty food. Ultrasonographic examination demonstrated the presence of numerous stones in the gallbladder. The patient initially elected treatment consisting of exogenously supplied chenodeoxycholic. The rationale for the treatment of this patient with chenodeoxycholic acid is that this compound:

A. Interferes with the enterohepatic circulation
B. Inhibits cholesterol synthesis
C. Increases de novo bile acid production
D. Increases cholesterol solubility in bile
E. Stimulates VLDL production by the liver.

14. Elevation in one or more of the lipoprotein fractions constitutes hyperlipoproteinemias. What enzyme defect causes hyperlipoproteinemia Type-I and increase in plasma chylomicrons and triacylglycerol levels?

A. Lipoprotein lipase
B. TAG - lipase
C. Cholesterol esterase
D. Acyl-CoA dehydrogenase
E. Methylmalonyl -CoA-mutase.

Lesson 23

<u>Theme:</u> Regulation and pathologies of lipid metabolism.

1. The living organisms that did not develop the system of defence against the unfavorable action of H_2O_2 during the evolution can exist only in anaerobic conditions. Which of the enzymes can destroy hydrogen peroxide?

A. Oxygenases and hydroxylases
B. Peroxidase and catalase
C. Cytochrome oxidase, cytochrome b
D. Oxygenase and catalase
E. Flavin-linked oxidases.

2. A 6 year old child was delivered to a hospital. Examination revealed that the child couldn't fix his eyes, didn't keep his eyes on toys, eye ground had the cherry-red spot sign. Laboratory analyses showed that brain, liver and spleen had high rate of ganglioside glycometide. What congenital disease is the child ill with?

A. Tay-Sachs disease
B. Turner's syndrome
C. Wilson's syndrome
D. Niemann-Pick disease
E. MacArdle disease.

3. Which of the listed hormones reduces the rate of lipolylis in fatty tissue?

A. Adrenaline

B. Insulin
C. Hydrocortisone
D. Somatotropin
E. Noradrenaline.

4. Activation of membrane lipids peroxidation is one of the basic mechanisms of membrane structure and functions damage as well as the death of a cell. The cause of this pathology is:
A. B_{12}-hypervitaminosis
B. B_1 -deficiency
C. B_3-hypervitaminosis
D. B_{12}-deficiency
E. Vitamin E deficiency.

5. A patient suffers from arterial hypertension due to atherosclerotic injury of blood vessels. The consumption of what dietary lipid needs to be limited?
A. Lecithine
B. Oleic acid
C. Cholesterol
D. Monooleateglycerol
E. Phosphatidylserine.

6. Laboratory investigation of a patient revealed a high level of plasma LDL. What disease can be diagnosed?
A. Gastritis
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C. Acute pancreatitis
D. Atherosclerosis
E. Pneumonia.

7. Clinical signs and laboratory testing of a patient allow to make the assumption of gall-bladder inflammation, colloid properties of bile disorder, the occurrence of gall-stones. Which substances can underlie the formation of gall-stones?
A. Oxalates
B. Urates
C. Cholesterol
D. Chlorides
E. Phosphates.

8. A 1-year-old child was brought to a clinic with signs of muscle weakness. Through the inspection, the deficiency of carnitine in the muscles was determined. The biochemical mechanism of the development of this pathology consists in the disorder of the process of:
A. Transport of fatty acids into mitochondria
B. Regulation of the level of Ca^{2+} in mitochondria
C. Substrate level of phosphorylation
D. Utilization of lactate
E. Synthesis of actin and myosin.

9. An experimantal animal that was kept on protein-free diet developed fatty liver infiltration, in particular as a result of deficiency of methylating agents. This is caused by disturbed generation of the following metabolite:
A. Acetoacetate
B. Cholesterol
C. DOPA
D. Choline
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10. A 58-year-old patient suffers from the cerebral atherosclerosis. Examination revealed hyperlipoidemia. What class of lipoproteins will most probably show increase in concentration in this patient's blood serum?
A. Fatty acid complexes with albumins
B. Very low density lipoproteins
C. Chylomicrons
D. Low density lipoproteins
E. High density lipoproteins.

11. In course of metabolic process active forms of oxygen including superoxide anion radical are formed in the human body. By means of what enzyme is this anion inactivated?
A. Super oxide dismutase
B. Glutathionereductase
C. Peroxidase
D. Catalase
E. Glutathioneperoxidase.

12. Under diabetes mellitus, the level of ketone bodies in blood dramatically rises, which results in the development of metabolic acidosis. What substance is the precursor of the ketone bodies synthesis?
A. Methylmalonyl-CoA
B. Succinyl-CoA
C. Propionyl-CoA
D. Malonyl-CoA
E. Acetyl-CoA.

13. Point out how acetone is formed in human organism:
A. In β-oxidation of fatty acids
B. At decarboxylation of acetoacetic acid
C. By condensation of two acetyl-CoA molecules
D. During the synthesis of fatty acids
E. At decarboxylation of β-hydroxybutyric acid.

14. Which substrate is used for the activation of acetoacetate in peripheral tissues?
A. Succinyl-CoA
B. Acetyl-CoA
C. Acetoacetyl-CoA
D. CoA-SH
E. Stearyl-CoA.

15. Normal concentration of ketone bodies in blood is:

A. 2-3 mg/l
B. 5-10 mg/l
C. 50-70 mg/l
D. 100-200 mg/l
E. 20-30 mg/l.

16. Which of the following effect of insulin is correct?

A. Activates the oxidation of fatty acids
B. Activates the lipolysis
C. Inhibit the synthesis of lipids
D. Enhances the synthesis of lipids
E. Stimulate production of ketone bodies.

17. Point out the hormone, which decreases the rate of lipolysis:

A. Adrenalin
B. Thyroxin
C. Insulin
D. Somatotropin
E. Glucagon.

18. How does adrenalin influence the activity of triglyceride lipase under the emotional stress?

A) Doesn't influence the lipase activity
B) Activates lipase directly
C) Activates protein kinase (thanks to cAMP), which phosphorylates the lipase
D) Inhibits lipase due to cAMP
E) Inhibits lipase directly.

19. Atherogenic factors that have a lot of cholesterol are:

A. HDL
B. VLDL
C. LDL
D. IDL
E. Chylomicrons.

20. A fatty degeneration in liver is prevented by the lipotropic substances. Which of the folloving behaves like them:

A. Choline
B. Glucose
C. Glycerol
D. Cholesterol
E. Glycine.

21. Consequences of hyperketonemia are:

A. Fatty degeneration of the liver
B. Atherosclerosis
C. Acidosis
D. Alkalosis
E. Obesity.

22. A diet enriched with lipotropic substances is recommended to a 65-year-old patient with signs of total obesity and fatty dystrophy of the liver. Which substances from the listed below are lipotropic?

A. Vitamin C
B. Cholesterol
C. Glucose
D. Methionine
E. Glycine.

23. The insufficient secretion of what enzyme is the cause of incomplete fats degradation in the digestive tract and appearance of great quantity of neutral fats in feces?

A. Pepsin
B. Phospholipase
C. Enterokinase
D. Amylase
E. Pancreatic lipase.

24. Synthesis of phospholipids is disordered under the liver fat infiltration. Indicate which of the following substances can enhance the process of methylation during phospholipids synthesis?

A. Glucose
B. Citrate
C. Methionine
D. Glycerin
E. Ascorbic acid.