

Topic of the lesson: LEUKEMIA

Aim: To be able to identify the main stages of leukemia on the basis of analyzes of hematological and pathophysiological data.

Main questions to the topic of the lesson:

1. Hemoblasts. Their general characteristics and types.
2. General characteristics of leukemia.
3. Classification of leukemia.
4. Comparison characteristics of hematological and cytochemical features of acute and chronic leukemia.
5. Hematological signs of leukemoid reactions and their differences with leukemia.
6. Principles of pathogenetical therapy of leukemia

Literature:

1. General and clinical pathophysiology/Gozhenko A.I. - Odessa National Medical University. - 2002. - p. 124-143
2. Pathophysiology/Gozhenko A.I., Gurkalova I.P. - Odessa National Medical University. - 2003. - p. 201-215

CONTROL QUESTIONS

№	Instructions to the execution of the task	Answers of the students with additions at the lessons
1.	What is hemoblastosis and leukemia?	
2.	Give arguments why leukemia has tumor origin? a, b, c, d, e	

3.	How leukemia differs from other malignant tumors a, b, c, d	
4.	How can you classify hemopoetic cells? a, b, c, d, e, f	
5.	What cells can be the source of leukemia?	
6.	Give the classification of leukemia? a, b, c,	
7.	The main sign of pathogenesis of acute leukemia is that...	
8.	The main sign of pathogenesis of chronic leukemia is that... .	

9.	Can the acute leukemia in the course of time turn into chronic form and vice-versa?	
10.	What factors can be the cause of leukemia development? a, b, c	

TASK 1. Give the scheme of granulopoiesis.

TASK 2. Give the scheme of lymphopoiesis.

TASK 3. Give the scheme of the leukemia pathogenesis.

TASK 4. Name main manifestations of the tumor progression by leukemia.

1. _____
2. _____

3. _____

TASK 5. Name the most often causes of death by leukemia

1. _____

2. _____

3. _____

TASK 6. What changes in peripheral blood are typical for acute leukemia

1. _____

2. _____

3. _____

4. _____

5. _____

TASK 7. Characteristics of peripheral blood by blast crisis by myeloleukemia:

1. _____

2. _____

3. _____

4. _____

5. _____

TASK 8. On the ground of changes in hemogram give the conclusion of blood system status:

Hemogram				Conclusion
Hb	52 g/l	Neutrophils		
Erythrocytes	$3,1 \times 10^{12}/l$	myeloblasts	4%	
Reticulocytes	0,1%	myelocytes	14%	
Thrombocytes	$85,0 \times 10^9/l$	metamyelocytes	10%	
Leucocytes	$182,0 \times 10^9/l$	band forms	8%	
Eosynophyles	5%	segments	38%	
Basophyles	0%	monocytes	0%	

		lymphocytes	0%	
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TASK 9. *To solve clinic-patophysiological tasks.*

A Patient who during 5 years suffered from chronic myeloleukemia had taken chronic medication with cytostatics. Now he complains of sharp deterioration: increasing of weakness, sleeplessness, high gingival hemorrhage, appearing of hemorrhage on shins, periodic fever. On examination: paleness of skin, in some areas- pustular eruptions. He has lymphadenopathy, splenomegalia, hepatomegalia. A patient has made the blood analysis. The result is compared with the previous analysis (3 months ago).

	Analyze A	Analyze B
Hb	86 g/l	125 g/l
Erythrocytes	$3,3 \times 10^{12}/l$	$4,1 \times 10^{12}/l$
Reticulocytes	0%	0,15%
Leucocytes	$58,0 \times 10^9 /l$	$17,0 \times 10^9 /l$
Myeloblasts	67%	3%
Promyelocytes	4%	11%
<i>Neutrophils:</i>		
Myelocytes	0%	7%
Metamyelocytes	0%	13,5%
Band forms	5,5%	14,5%
Segmented neutrophil	15%	36%
Eosinophiles	8%	5%
Basophiles	0%	7,5%
Lymphocytes	0,5%	2,0%
Monocytes	0%	0,5%

Questions:

1. Analyze the hemograms A and B and make the conclusion from each of them. What is the blood system status?

2. What analysis was made later?

3. How can we characterize the changes in the first and second blood analysis?

4. What are the mechanisms of their development?

5. What mechanisms are inherent in symptomatology?

TASK 10. *Solve the tests for self control*

1. A 44 -year -old patient was delivered to the infection department with a diagnosis of follicular tonsillitis. Temperature is 38,8°C, skin and tunica mucosa are usual colored. Pulse is 120 for minute, arterial pressure- 130/70.

On blood analyze: myeloblasts- 68%, lymphocytes - 14%, monocytes- 2%, segmentonuclear- 16 %, and ESR-46 mm/h. What disease has a patient?

- A. chronic myeloleukemia
- B. acute myeloleukemia
- C. acute agranulocytosis
- D. chronic lympholeukemia
- E. leukemoid reaction

2. It has been reveled that against the background of normal general quantity of leucocytes in peripheral blood a patient has an increase of eosynophyles and monocytes. What type of leukemia has a patient?

- A. chronic myeloleukemia
- B. acute myeloblast leukemia
- C. chronic lympholeukemia
- D. acute lymphoblast leukemia
- E. erythremia

3. A 75 –year old patient was delivered to the clinic. He complained of long-term pains (more then 2 months) in the left hypochondrium. By palpation was detected the splenomegakia, in blood analysis showed increase of general quantity of leucocytes up to 250 G/l, eosinophilo-basophilic association, increase of myelocytes quantity, young forms. For what type of leukemia is this hemogram typical?

- A. megakaryocytic leukemia
- B. acute myeloleukemia
- C. cronic myeloleukemia
- D. lymphoblast leukemia
- E.erythromyelosis

4. It has been revealed that a 12- year-old child has acute lymphoblast leukemia. What changes in peripheral blood are typical for this disease?

- A. thrombocytopenia
- B. presence of myelocytes
- C. presence of myeloblasts
- D. anemia
- E. leucopenia with leucocytosis up to 80%

5. A 64- year- old patient had the examination for assignment to a treatment at a health resort. On examination: lymphadenopathy of inguinal and cervical nodes. The liver goes beyond the costal margin for 3 sm., splenomegalia (+14 sm.). On blood analyze: Hb-120 g/l, erythrocytes- $3,7 \times 10^{12}$ in 1 liter, leucocytes 30×10^9 /l, young- 2 %, segmentonuclear- 33 %, lymphocytes - 60%, monocytes- 2%, band forms - 1%, and ESR-20 mm/h. Which is a suggested diagnosis?

- A. hepatocirrhosis
- B. liver cancer
- C. chronic lympholeukemia
- D. tuberculoid lymphadenitis

6. It has been revealed that a patient has in his cells the Philadelphia chromosome from myeloid raw. What leukemia is it?

- A. chronic lympholeukemia
- B. acute myeloleukemia
- C. chronic myeloleukemia
- D. acute lympholeukemia
- E. myelom disease

7. A woman after the long-term remission has developed blast crisis (increase of myeloblasts quantity up to 35%). For what leukemia is this parameter typical ?

- A. leukemoid reaction
- B. acute myeloleukemia
- C. chronic myeloleukemia
- D. acute lympholeukemia
- E. chronic lympholeukemia

8. It has been revealed that the patient with chronic myeloleukemia has signs of anemia- decrease of erythrocytes

quantity and the content of hemoglobin, polychromatophil normocytes, microcytes. The pathological basis is:

- A. chronic loss of blood
- B. substitution of erythrocytic democracy
- C. intracellular haemolysis
- D. deficiency of vit B12
- E. decrease of erythropoietin secretion

9. A 30- year- old woman consulted a doctor in connection with the discomfort in the left flank, vomiting, arthralgia, fever, periodic haemorrhagies. Up to this day a patient felt healthy. She leaved in Chernobyl before the catastrophe. On examination: Banti's [hepatolienal] syndrome, lymphadenopathy. In blood: leucocytes $200 \times 10^9 / l$, very many granulocytes of different maturity, less then 5% of myeloblasts, Ph chromosome in cells of red marrow. What diagnose can you suppose?

- A. chronic myeloleukemia
- B. acute myeloleukemia
- C. acute lympholeukemia

- D. myelofibrosis
- E. leukemoid reaction

10. A 53- year -old patient complains of general weakness, inappetence, and high body temperature. On examination: polylymphadenopathy, lymph nodes with compact consistence, hepatomegalia. On blood analyze: erythrocytes- $4,0 \times 10^{12}$ in 1 liter, leucocytes $100 \times 10^9 / l$, young- 2 %, segmentonuclear- 16 %, lymphocytes - 75%, monocytes- 5%, band forms - 4%, Hb-110 g/l, Gumprecht's shadows. What diagnose can you suppose?

- A. chronic lympholeukemia
- B. acute leukemia
- C. chronic myeloleukemia
- D. lymphogranulomatosis
- E. myelom disease

11. A patient has acute myeloleykemia. What is the main factor in pathogenesis of its development?

- A. disorder of differentiation and maturing
- B. disorder of neutrophil metabolism

C. increase of general quantity of
immature leucocytes
D. increase of myeloblasts quantity

E. decrease of general quantity of
immature leucocytes

For notes
