LESSON № 18

Topic: PATHOLOGY OF CIRCULATING BLOOD VOLUME. BLEEDING

Aim of the lesson: to study the types of circulating blood volume disorders, their causes and mechanisms of development, to study pathogenesis and compensatory mechanisms after acute bleeding.

QUESTIONS:

1. Blood, its composition and functions. Hematocrit.
2. Categorization of disorders of circulating blood volume (hypervolemia, hypovolemia).
3. Hypervolemia. Types (simple, polycythemic, oligocythemic). Causes and outcomes.
4. Hypovolemia. Types (simple, polycythemic, oligocythemic). Causes and outcomes.
5. Erythrocytosis: causes and mechanisms. Polycythemia or Wakes's disease.
6. Bleeding. Types and causes. Pathogenesis and main clinical symptoms of acute bleeding.
7. Compensatory-adaptative reactions of organism at acute bleeding. Stages of compensation (reflectoric, hydremic, bone-marrow initiation).
8. Parameters of severity of bleeding.
9. Factors which affect bleeding outcome.
10. Blood rheological and plasma composition disturbances. Causes and outcomes.

Laboratory work 1. ***Measurment of reticulocyte count in the blood using microscope***

Description of the work 1. To measure reticulocyte count students use light microscope.

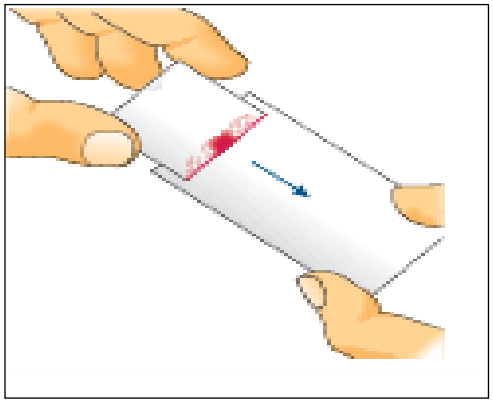

Fig. 18.1 – Technology of preparation of blood smears

The blood samples with *brilliant creasil blue* paint should be used for investigation. Rt count estimation is perfomed simultaneously with erythrocytes count (1000) in separated area. Rt count reports the number of reticulocytes as a percentage (%) of the number of red blood cells or promille (1‰ = 0,1%). Reticulocytes are newly-produced red blood cells. They are slightly larger than totally mature red blood cells, and have some residual ribosomal RNA. The presence of RNA is visualized as a blue web-like structure.

Fig. 18.2– The peripheral blood smears

Tasks

1

Patient, 35 years old, male, arrives to the hospital after chest trauma.

Clinical findings: paleness, blood pressure 90/60 mm Hg, weak puls, frequent breath, X-ray chest examination reveals severe darkness

in thoracic cavity.

Blood analysis, after 4 days of hemostatic operation: Нв – 71 g/l, RBC – 3 x 10^{12}/l, Rt – 12 %.

Blood sample: a lot of polychromatophills, 2 oxyphilic normocytes.

Make conclusion.

2

The patient, 32 years old man, was arrived to hospital after traffic accident. The bleeding was about 750 ml. Patient body weight is 75 kg, normal constitution. Estimate the severity of bleeding for him. Will you perform some treatment actions?

3

The patient, 28 years old woman, was arrived to hospital after traffic accident. The bleeding was about 750 ml. Her body weight is 55 kg, normal constitution. Estimate the severity of bleeding for him. Will you perform some treatment actions?

4

The patient, 5 years old boy, was arrived to hospital after traffic accident. The bleeding was about 400 ml. His body weight is 17 kg, normal constitution. Estimate the severity of bleeding for him. What treatment actions will you perform?

LITERATURE:

1. General and clinical pathophysiology / ed. by A.V. Kubyshkin. – Vinnytsa: Nova Knyha Publishers. – 2011. – P. 363-371.

2. Pathology / ed. by E. Rubin, J.L. Farber. – 2nd ed. – 1994. – P. 994. – 1010.

3. Internal medicine / ed. by Harrisons. – 17th edition. – N. Y. – 2008. – P. 363-369.