

## IRON DEFICIENCY ANEMIA

### *Single choice tests*

- 1) Choose the hemoglobin level in the newborn:
  - A) 100–140 g/l;
  - B) 110–130 g/l;
  - C) 120–140 g/l;
  - D) 140–160 g/l;
  - E) 180–240 g/l.
  
- 2) Choose the lowest level of normal hemoglobin in a healthy infant:
  - A) 90;
  - B) 100;
  - C) 110;
  - D) 120;
  - E) 130
  
- 3) Choose the most common cause of iron deficiency anemia in early childhood:
  - A. chronic diseases
  - B. nutritional factor
  - C. chronic bleeding
  - D. iron absorption disorders
  - E. infectious diseases
  
- 4) Choose the most specific indicator in the diagnosis of iron deficient anemia in children:
  - A. hypochromia
  - B. presence of source of bleeding
  - C. reduced serum iron level
  - D. insufficiency of iron in the diet of the child
  - E. active growth of the child
  
- 5) Choose the laboratory result that is not characteristic for iron deficiency anemia:
  - A. decreased transferrin saturation
  - B. decreased serum iron level
  - C. decreased serum ferritin level
  - D. decreased MCHC (Mean Corpuscular Hemoglobin Concentration) in red blood cells
  - E. decreased total iron-binding capacity
  
- 6) Choose the treatment indicated for children with moderate (second degree) iron deficiency anemia:
  - A) vegetables;
  - B) blood transfusions;
  - C) cooked liver;
  - D) oral iron supplements;
  - E) parenteral iron drugs.
  
- 7) Choose the factor that increase the iron absorption from oral iron supplements:
  - A) acidity of gastric juice;
  - B) activity of salivary amylase;
  - C) secretory function of the stomach;
  - D) characteristics of iron from oral iron supplementation preparations;
  - E) the proteolytic activity of human gastric juice.
  
- 8) Choose the etiology of the “late” anemia of premature infant:
  - A. hemolytic anemia

- B. iron deficiency anemia
- C. posthemorrhagic anemia
- D. aplastic anemia
- E. hereditary anemia

9) Select the food from which iron is easier absorbed:

- A. Meat
- B. Fruits
- C. Vegetables
- D. Cereals
- E. Milk and dairy products

10) Choose the feature that is not characteristic for B12 - deficiency anemia:

- A. megaloblastic type of hematopoiesis
- B. disorder of the intrinsic factor (castle factor) secretion
- C. hyperchromy
- D. insufficient intake of vit. b12 with food
- E. increased serum iron level

11) A child of 3 years of age has clinical and laboratory signs of moderate (second degree) iron deficiency anemia. Choose the most efficient method of treatment:

- A) B12 and folic acid supplements;
- B) parenteral iron preparations;
- C) oral iron preparations only until the normal hemoglobin level is reached;
- D) oral iron preparations until the normal hemoglobin level is reached and additionally 2-3 months of prophylactic dose;
- E) only diet changes with food rich in iron.

12) A case of two months infant who was born prematurely (second degree prematurity), breastfed. Results of the complete blood count shows the hemoglobin level of 120 g/l, red blood cells –  $3.9 \text{ mln/mm}^3$ ; ESR - 7 mm/hour. Choose the necessary recommendation for this child:

- A. prescription of iron supplement in therapeutic dose
- B. the only recommendation is to improve maternal nutrition
- C. prescription to the mother of oral iron supplements
- D. bottle feeding of the infant with adapted milk formulas
- E. prescription of iron supplement in prophylactic dose

13) Choose the feature that is not characteristic for iron deficiency:

- A. it's more frequently diagnosed in children of 6-24 months of age
- B. usually children with iron deficiency are fed mostly with cow's milk and buckwheat porridge
- C. evolution of iron deficiency is mostly asymptomatic
- D. hypochromic anemia
- E. increased serum iron levels

14) Choose the recommendation that is not applicable for the treatment of children in early childhood with iron deficiency anemia:

- A. oral iron supplement in dose of 5-6 mg/kg/24 hrs
- B. oral iron preparations only until the normal hemoglobin level is reached
- C. oral iron preparations until the normal hemoglobin level is reached and additionally 2-3 months of prophylactic dose
- D. parenteral administration of iron containing drug in children with malabsorption
- E. correction of the diet with food rich in iron

- 15) Indicate the type of anemia that is not microcytic and hypochromic:
- A. Iron deficiency anemia
  - B. Beta-thalassemia major
  - C. Beta-thalassemia minor
  - D. Hemolytic anemia due to insufficiency of glucoso-6-phosphatdehydrogenase
  - E. Anemia of chronic diseases
- 16) Choose the statement that is not correct for the folic acid deficiency anemia:
- A. intake of phenobarbital influences folic acid metabolization
  - B. folic acid deficiency anemia develops in cancer patients
  - C. folic acid deficiency anemia doesn't develop in children fed with goat milk
  - D. folic acid deficiency anemia can develop during pregnancy
  - E. folic acid deficiency anemia develops in children with malabsorption

***Multiple choice tests***

- 1) Select etiologic causes of iron deficiency anemia development:
- A. Insufficiency of iron in food
  - B. Bone marrow aplasia
  - C. Malabsorption syndromes
  - D. Increased demands in iron of the child's growing body
  - E. Infectious diseases
- 2) Enumerate organs that represent storage iron pools in the body:
- A. Lymph nodes
  - B. Liver
  - C. Kidneys
  - D. Muscle tissue
  - E. Spleen
- 3) Enumerate clinical signs characteristic for the anemic syndrome:
- A. pallor of the skin
  - B. lymphadenopathy
  - C. trophic changes of the skin, hair, nails
  - D. systolic murmur on heart auscultation, heard at the cardiac apex
  - E. fever
- 4) Enumerate changes in the Complete Blood Count found in iron deficiency anemia in children:
- A. decreased hemoglobin level
  - B. decreased white cells count
  - C. decreased reticulocytes count
  - D. decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC)
  - E. moderate decrease of red blood cells count
- 5) Enumerate laboratory tests changes characteristic for iron deficiency anemia in children:
- A. decreased serum iron levels
  - B. decreased serum iron-binding capacity
  - C. hyperchromy in the blood smear
  - D. hypochromy in the blood smear
  - E. serum transferrin saturation and ferritin levels are lower than normal
- 6) Enumerate laboratory tests changes characteristic for B12 deficiency anemia:
- A. megaloblastic type of hematopoiesis

- B. decreased reticulocyte count
- C. hyperchromic anemia
- D. increase of serum iron level
- E. microcytic anemia

7) Enumerate laboratory tests changes characteristic for latent iron deficiency:

- A. reduced hemoglobin levels;
- B. normal hemoglobin levels;
- C. positive Desferal test for iron overload;
- D. decreased serum iron levels;
- E. increased reticulocyte count.

8) Enumerate food from which iron is readily absorbed:

- A. meat
- B. cereals
- C. fish
- D. vegetables
- E. fruits

9) Enumerate therapeutic indications for children with iron deficiency anemia:

- A. blood products and plasma substitutes;
- B. corticosteroids;
- C. vitamin B12;
- D. ascorbic acid;
- E. iron supplements.

10) Enumerate recommendations for iron deficiency prophylaxis in infants:

- A. iron supplements for pregnant women during the third trimester of pregnancy
- B. cow's milk feeding
- C. breastfeeding
- D. oral iron supplements for all children in the first year of life
- E. oral iron supplements during the first year of life for all children born prematurely

11) A case of seven-year old child complaining pallor of the skin, headaches, abdominal pain. Complete Blood Count results: hemoglobin level 99 g/l; red blood cells 3,8 mln/mm<sup>3</sup>; decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC). Parasitological examination of feces revealed helminth eggs. Enumerate optimal therapeutic indications:

- A. Mebendazol
- B. Acetylsalicylic acid
- C. parenteral iron drugs
- D. oral iron drugs
- E. Co-trimoxazole

12) A case of two-year old child. History: frequent respiratory infections, enterocolitis, loss of appetite. At examination: pallor of the skin; Complete Blood Count results – hemoglobin level 92 g/l; red blood cells 3,8 mln/mm<sup>3</sup>; decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC); ESR – 7 mm/hour. Enumerate correct statements from below:

- A. diagnosis – iron deficiency anemia
- B. the child needs iron supplements only until normalization of blood indices
- C. the child needs therapeutic doses of iron supplements until normalization of blood indices and two more months in prophylactic dose
- D. iron preparation must be administered intravenously

- E. therapeutic dose of elementary iron in the iron supplement should be 5-6 mg/kg body weight in 24 hrs

13) A case of eight months child who is pale, irritated, has excessive sweating, wakes up frequently, sleep poorly. On examination anterior fontanel has the size of 2x3 cm, the head got a square shape, flattening of the posterior skull (flat occiput) is present. Complete Blood Count results – hemoglobin level 89 g/l; red blood cells 3.6 mln/mm<sup>3</sup>; decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC); ESR – 7 mm/hour. Enumerate correct statements included in the diagnosis of this child from below:

- A. mild anemia (first degree)
- B. moderate anemia (second degree)
- C. first degree of rickets, acute evolution
- D. second degree of rickets, acute evolution
- E. second degree of rickets, subacute evolution

14) Enumerate diseases that determine reduced iron absorption in the gastrointestinal tract:

- A. celiac disease
- B. cystic fibrosis
- C. helminthes infestation
- D. rickets
- E. cholecystitis

15) Enumerate laboratory indicators that confirm the diagnosis of iron deficiency anemia:

- A. reduced serum iron levels
- B. increased total iron binding capacity of the serum
- C. marked reticulocytosis
- D. increased latent iron-binding capacity of the serum
- E. increased MCV (Mean Corpuscular Volume) of red blood cells

16) Additionally to reduced number of red blood cells in patients with iron deficiency anemia, in the peripheral blood film may be found:

- A) Anisocytosis, microcytosis
- B) abnormal red blood cells named “target cells”
- C) Poikilocytosis
- D) Spherocytosis
- E) Macrocytosis

17) Enumerate diseases that should be differentiated from iron deficiency anemia:

- A. Acquired hemolytic anemia
- B. Thalassemia trait
- C. Sickle cell anemia
- D. Hemophilia
- E. Disseminated Intravascular Coagulation Syndrome

18) Enumerate correct affirmations characteristic for folate-deficiency anemia:

- A. develops in children fed with goat’s milk
- B. may be seen in cases of malabsorption syndromes
- C. may be caused by cancer
- D. often occurs during pregnancy
- E. anticonvulsant drug such as phenobarbital does not affect the absorption of folic acid

19) A case of eight months child. At the age of seven months the feeding was supplemented with porridge. The child developed bulky, greasy and increased gas mixed in the stool. Coprological analysis of feces

revealed increased quantity of fatty acids (+++) and soaps (+++). Complete Blood Count results – hemoglobin level 90 g/l; red blood cells 3.5 mln/mm<sup>3</sup>; decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC). Enumerate correct statements regarding the diagnosis and recommendations for this child:

- A. cystic fibrosis
- B. celiac disease
- C. iron deficiency anemia
- D. exclusion from feeding cereal porridge
- E. oral iron supplements should be administered

20) A child of three months came to the Family Doctor Office for routine vaccination. Complete Blood Count results – hemoglobin level 92 g/l; red blood cells 3.8 mln/mm<sup>3</sup>; decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC). Enumerate correct recommendations in this case:

- A) to vaccinate the child
- B) introduction of supplementary food
- C) oral iron supplements should be administered for about 2 weeks
- D) no oral iron supplements are needed
- E) oral iron supplements should be administered for 3 months

21) Sideropenic syndrome characteristic for iron deficiency anemia includes the following signs and symptoms:

- A) tremor of the extremities;
- B) trophic changes of the skin, nails, hair;
- C) splenomegaly;
- D) taste sense alterations and soreness of the tongue;
- E) systolic murmur in apical region on heart auscultation.

22) The microcytic anemia is characteristic for:

- A. iron deficiency
- B. vitamin B12 deficiency
- C. lead poisoning
- D. red cell membrane defects
- E. thalassemia traits

23) The macrocytic anemia is characteristic for:

- A. vitamin B12 deficiency
- B. thalassemia traits
- C. Fanconi's anemia
- D. folate deficiency
- E. red blood cell enzyme defects

24) A case of eight months child who is breastfed. Complete Blood Count results – hemoglobin level 102 g/l; red blood cells 4.2 mln/mm<sup>3</sup>; slightly decreased mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC); serum iron level – 14 mcg/l. Enumerate correct statements regarding the diagnosis and recommendations for this child:

- A. latent iron deficiency
- B. iron deficiency anemia
- C. complementary food should be introduced
- D. parenteral iron preparations should be administered
- E. oral iron preparations are recommended for about 2 months

25) A case of two months child who was born prematurely, weight at birth 2500 g; currently on breastfeeding; no complains. Complete Blood Count results in the normal range. Enumerate correct recommendations for this child:

- A. oral iron preparations in a prophylactic dose of 1-2 mg/kg body weight daily
- B. oral iron preparations in the dose of 6 mg/kg body weight daily
- C. the child does not need iron supplementation
- D. parenteral iron preparations should be administered
- E. duration of iron prophylaxis should be till the 1 year of age.

26) Enumerate correct statements for specific prophylaxis of iron deficiency anemia in children:

- A. iron supplements are indicated to premature infants starting with the age of eight weeks
- B. iron supplements are indicated for pregnant women with twin pregnancy
- C. oral iron supplement dose constitutes 6 mg/kg body weight daily
- D. oral iron supplement dose constitutes 1-2 mg/kg body weight daily
- E. duration of iron prophylaxis should be 1-2 years.

## IRON DEFICIENCY ANEMIA

### *Single choice tests*

1. E
2. C
3. B
4. C
5. E
6. D
7. D
8. B
9. A
10. E
11. D
12. E
13. E
14. B
15. D
16. C

### *Multiple choice tests*

1. A,C,D,E
2. B,D,E
3. A,C,D
4. A,B,D,E
5. A,D,E
6. A,C
7. B,C,D
8. A,C
9. D,E
10. A,C,E
11. A,D
12. A,C,E
13. B,E
14. A,B,C
15. A,B,D
16. A,C
17. A,B,C
18. A,B,C,D
19. B,C,D,E
20. A,E
21. B,D
22. A,C,E
23. A,C,D
24. B,C,E
25. A,E
26. A,B,D