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Deficiency Symptoms Observed in Chronic Diseases

Matniyozova Zaynab Tokhtaboyevna, Hodjaeva Nafisa Abayevna
Bukhara State Medical Institute

Abstract: Anemia that occurs in infectious and inflammatory processes, non-infectious inflammatory diseases and tumors is called "anemia in chronic diseases" (AHD), emphasizing the role of the underlying disease in its pathogenesis. The prevalence of anemia in a number of diseases reaches 100%. Despite the variety of pathogenetic mechanisms of anemia in such situations, one of the main ones is the redistribution of iron to the cells of the macrophage system, which are activated in various inflammatory (infectious and non-infectious) or inflammatory processes. According to the prevalence of neoplastic processes, ACH is in the 2nd place after iron deficiency anemia (IDA).

Keywords: anemia, chronic disease, distribution, treatment tactics.

The prevalence of AHD in the elderly and elderly is from 2.9 to 61% in men and from 3.3 to 41% in women, and is more pronounced in young and mature women. Its frequency reaches 36-80% in hospitalized elderly patients (5-14% in ambulatory patients).

Among patients with systemic connective tissue diseases, anemia occurs in almost half of patients, and ACH predominates. In chronic kidney disease, anemia with a hemoglobin level of less than 100 g / l is noted in more than 25% of patients. The diagnostic criteria for AHD are detailed. The main way to cure anemia in this category of patients is the treatment of the active inflammatory process - antibacterial therapy, taking into account the nature of the suspected or confirmed infectious agent, basic and anti-inflammatory therapy for rheumatic diseases, surgical treatment with appropriate indications (abdominal cavity abscesses, purulent pyelonephritis, etc.).

In such cases, prescribing iron and vitamin B12 supplements is usually ineffective, delaying timely identification of the underlying cause of anemia and appropriate therapy. Identification and recognition of ACH as a separate pathogenetic variant is important because of the similarity of this variant with IDA and some sideroacrestic anemias, although the nature and treatment methods of these anemias are different.

Anemia is found in 4% of men and 8% of women, and in 8-44% of middle-aged and elderly people. One of the common variants of anemia is anemia of chronic diseases (AHD) or chronic inflammatory anemia or iron distribution anemia, which occurs in patients with chronic activation of cellular immunity and lasts for more than 1-2 months. In a number of chronic diseases, the frequency of occurrence of this anemia reaches 100% [1,2]. ACH is the second most common type of anemia after iron deficiency anemia (IDA) [3]. Diseases of old age and old age are characterized by polymorbidity, that is, accumulation of diseases, among which anemia occupies an important place. The prevalence of AHD in the elderly and elderly ranges from 2.9 to 61% in men and from 3.3 to 41% in women. In hospitalized elderly patients, its frequency reaches 36-80% (ambulatory conditions with general disease symptoms, often masking or

masking the main disease[4,11]. There is a direct relationship between the level of AHD and the severity of the main disease. Anemization anemia increases the clinical manifestations of damage to the arteries supplying the brain and lower extremities, increases heart failure, and in lung diseases, anemia increases the hypoxic syndrome. The body adapts to low levels of hemoglobin (Hb) and red blood cells, and patients are often overworked work, psychoemotional overloads and other factors, getting used to their discomfort. Changes in internal organs appear when the level of Hb drops to 80-70 g / l, and when the concentration of Hb falls below 40 g / L, the development of anemic coma high probability [6]. Anemia criteria (according to WHO): women - Hb concentration less than 120 g / l (during pregnancy - less than 110 g / l), men - Hb concentration less than 130 g / l . In moderate and mild AHD, Hb concentration is usually 100-110 g/l; in severe diseases, it can be 80-90 g / l or lower. If the degree of decrease in Hb concentration does not correspond to the severity of the disease, it is necessary to look for another (specific) cause of anemia, primarily bleeding and hemolysis[10].

Normal indicators of hemogram and iron metabolism in the body are presented in the table [1]. Morphological examination of red blood cells in AHD reveals normochromia or moderate hypochromia. Central clearing and peripheral "darkening" in red blood cells diameter depends on approximately 1:1, with hypochromia - 2-3:1. The color index is 0.85-1.05, and the developing anemia becomes hypochromic. In normotsytyAHD, normocytes predominate in the blood smear, and microcytes may rarely be present. In normocytic anemia MCV 81-100 fl. Regeneration is observed in the bone marrow – the number of reticulocytes is 1.5-5%. The number of white blood cells corresponds to the accompanying pathology. In the case of infection and severe intoxication, toxic granularity of neutrophils is determined[6]. To make a diagnosis, it is necessary to assess the adequacy of the state of iron metabolism: serum iron (HS), ferritin serum ferritin (FS), transferrin iron saturation level (NTF) and transferrin receptor serum level (FiU).). The level of ferritin is the gold standard for evaluating the amount of iron stored in the body: it is directly proportional to the accumulation of iron in macrophages and hepatocytes in the absence of infection or inflammation. Its decrease is 100% specific for identifying cases of iron deficiency. Ferritin concentrations may be elevated in AHD associated with infection, inflammation, and malignancy. A Hb content of more than 28 pg in reticulocytes indicates sufficient iron reserves for Hb synthesis and erythropoiesis.

It should be taken into account that transferrin (Tf) is characterized by the qualities of a "negative" acute phase protein, which means that acute inflammation contributes to a decrease in its level. Malignant tumors, liver diseases, nephrotic syndrome, and malnutrition can decrease serum Tf concentration, while pregnancy and oral contraceptive use can increase this indicator[8]. The total iron-binding capacity of the serum reflects the "starvation" level of the serum and is related to the level of Tf. An increase in heart rate is observed with iron (D) deficiency. This is observed in diseases with a decrease in this indicator. Main pathogenetic factors The mechanism of AHD is considered to be the redistribution of iron in the cells of the macrophage system activated during various inflammatory or tumor processes.

Anemia is very diverse in its etiology, pathogenesis, and clinical and hematological features. In the clinical and pathogenetic classification of anemia, there is a section on iron metabolism disorders (iron deficiency, iron distribution, sideroachrestic anemia). In the morphological classification of anemia, ACH belongs to normocytic anemia, and accordingly, the degree of regeneration - to regenerative ones[11]. According to the ICD 10 revision, the following forms of anemia associated with chronic diseases are considered: D63 Anemia in chronic diseases classified under other headings; D63.0 Anemia in neoplasms (C00+); D63.8 Anemia in other chronic diseases classified under other headings. Clinical conditions associated with AHD: acute and chronic infections - viral, including HIV, bacterial, parasitic, fungal; tumors - hemoblastosis, solid tumors; autoimmune diseases - rheumatoid arthritis, systemic lupus erythematosus and other connective tissue diseases, vasculitis, sarcoidosis; chronic inflammatory bowel diseases; chronic kidney disease (CKD); endocrine pathology; liver diseases; chronic non-inflammatory diseases - severe trauma, thermal burns; mixed diseases - alcoholic cirrhosis of the liver,

circulatory failure, thrombophlebitis, cardiovascular disease [5?6]. The clinical presentation of a patient with anemia is determined by the pathology causing anemia and the severity of tissue hypoxia. ACH - significant loss or increase in protein consumption (nephrotic syndrome, chronic kidney failure, severe burns, chronic infections and active inflammatory processes, malignant tumors, severe liver diseases). There are no data on the effect of inflammatory reactions on the concentration of FiU [7,8]. A characteristic feature of AHD is the combination of D and, accordingly, iron deficiency in hematopoietic bone marrow tissues with intensive iron absorption by macrophages and dendritic cells of the reticuloendothelial system (RES). Under normal conditions, iron released from decomposing red blood cells, which is reused in the synthesis of new hemoglobin molecules, enters the iron-containing store. As a result, the content of PS increases[9]. AHD is diagnosed in the presence of hypoferremia and a high or normal level of FS. It occurs as a result of stimulation of iron accumulation in the RES and immune activation of ferritin synthesis. With IDA and AHD, a decrease in the concentration of LC and saturation of Tf with iron is observed. A decrease in Tf saturation with iron in AHD reflects a decrease in serum iron concentration, while in IDA, an increase in Tf content (in the first case, this indicator is in the normal range or elevated), which leads to a decrease in Tf. it is more obvious that it is saturated with iron. When combined with ACH and concomitant IDA, a more severe degree of microcytosis and pathological changes are noted. In order to determine functional J during erythropoietin (EPO) therapy in patients with AHD, it is proposed to determine the percentage of hypochromia of red blood cells and the level of Hb in reticulocytes [12,13]. AHD diagnostic criteria: clinical signs (depending on the disease: inflammatory, tumor or infectious); pathology (hypoproliferative anemia, impaired release of iron from the cells of the mononuclear phagocyte system for Hb synthesis, reduced lifespan of red blood cells); laboratory data (white blood cells and platelets: changes depend on the disease in which anemia is observed; red blood cells: Hb level decreases - often from mild (Hb 95 g / l) to moderate (Hb 80 g / l) anemia. level of severity; Ht decreases; normocytic/normochromic anemia; microcytic hypochromic anemia; the number of reticulocytes in the blood is normal or slightly increased; blood chemistry: LC level is normal or moderately decreased; OZHSS is normal or decreased; Tf level decreased or normalTf; NTF decreased; PS level normal or increased; cytokine level increased; red bone marrow: hemosiderin content normal or increased, number of sideroblasts decreased); treatment: treatment with iron preparations has no effect [15].

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