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ETILOGY AND PATHOGENESIS HEAVY CHAIN DISEASES

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Annotation: Heavy chain diseases (BTCs) are rare tumor diseases of a lymphoproliferative nature, in which defective immunoglobulins are synthesized (with missing light chain fragments). There are several variants of the disease-BTC-α, BTC-γ, BTC-μ and BTC-δ. Clinical manifestations are caused by damage to the lymphatic system and hematopoietic organs (enlarged liver, spleen, lymph nodes, diarrhea, edema, exhaustion, etc.). Diagnosis is based on complex immunopathochemical studies. Treatment is aimed at suppressing the tumor process using polychemotherapy (cytostatics, corticosteroids according to the scheme).

Key words: paraproteinemic hemoblastosis, cytostatics, enlarged liver, spleen, lymph nodes, diarrhea, edema, exhaustion.

Heavy chain diseases are malignant neoplasms (paraproteinemic hemoblastoses) characterized by hypersecretion of heavy chain fragments and the complete absence of light chain immunoglobulins of various classes, which leads to damage to the lymphatic and hematopoietic systems. Diseases of the γ (gamma), α (alpha), μ (mu) and exceptionally rare – δ (delta) heavy chains are distinguished.

The clinical picture of diseases of this group is similar to lymphomas. Heavy chain diseases occur mainly in adults aged 20-40 years, more often in residents of Mediterranean countries. In total, several hundred cases of this variant of paraproteinemic hemoblastosis have been recorded in the world, and 85% of them are patients with BTC-α. Heavy chain disease with the secretion of heavy chain fragments γ (gamma) was first described by Franklin in 1963. Risk factors for developing diseases include various infectious diseases of the respiratory tract, intestinal infections, helminthiasis, autoimmune pathology (rheumatoid arthritis, Sjogren's syndrome, autoimmune hemolytic anemia, etc.). Due to the onset of somatic mutations, plasma cells lose some of the structural genes responsible for the production of light chains of immunoglobulins, and begin hypersecretion of aberrant heavy chains. At the same time, pathologically altered heavy chains (there is a deletion of the CH1 region in their central part) cannot bind to light chains, and the synthesized immunoglobulins become defective. An excessive amount of heavy chains leads to their accumulation in such structural cellular elements as the endoplasmic reticulum and Golgi apparatus, their damage and, ultimately, cell death.

The clinical symptoms of heavy chain diseases are similar to the characteristic manifestations of lymphatic tumors (damage to the lymph nodes, liver and spleen, bone marrow), having their own characteristics depending on the specific variant of the disease.

Heavy gamma-chain disease (Franklin's disease) is more common in men aged 50-60 years, manifested by fever (body temperature rises to 38-39 degrees and remains at this level for a long time), general weakness, abdominal pain, difficulty swallowing, pronounced weight loss (exhaustion), frequent viral and bacterial infections. Physical examination shows an increase in the lymph nodes, liver, spleen, and thyroid gland. BTCG progresses rapidly, and most patients die 5-6 years after the onset of the disease from infectious complications (acute pneumonia, sepsis).

Alpha-chain disease (BTC-α) is the most common type of heavy-chain pathology, affecting mainly adults aged 20-40 years living in Mediterranean countries and suffering from various intestinal diseases. The abdominal form of BTC-α is manifested by malabsorption syndrome: malabsorption of food with the development of severe prolonged diarrhea, edema, skin damage, hair loss, and exhaustion. Patients are often concerned about abdominal pain, general weakness, and may have a transient fever. As a rule, the peripheral lymph nodes are not enlarged, the liver and spleen are of normal size. Very rare is the bronchopulmonary form of heavy alpha-chain disease, manifested by lung damage and enlarged mediastinal lymph nodes.

Heavy chain mk(mu) disease is a rare disease observed in some patients with chronic lymphocytic leukemia. At the same time, the symptoms are non-specific: the lymph nodes are not enlarged, hepatomegaly, periodic fever, signs of general intoxication may occur.

Delta-chain disease is extremely rare (isolated cases of the disease have been described), manifests itself as a bone marrow lesion with the clinical picture observed in myeloma (bone pain, pathological fractures, bleeding, thrombosis, anemic syndrome), and the development of chronic renal failure.

Diagnosis of heavy chain diseases

Diagnosis of heavy chain diseases is based on the identification of clinical signs of lymphoproliferative diseases (enlargement of regional lymph nodes, liver and spleen, intoxication syndrome) and laboratory and instrumental studies that confirm the diagnosis of a specific variant of BTCAND exclude other diseases of the lymphatic system and hematopoietic organs.

In a clinical blood test, anemia is detected, often-leukopenia due to a decrease in the number of granulocytes, the appearance of atypical lymphoid and plasma cells, thrombocytopenia. ESR is usually elevated. When examining the bone marrow, an increase in the content of plasmocytes (or lymphocytes) is noted.

The final diagnosis is established after immunochemical analysis of serum proteins and detection of structurally defective H-chains that are not associated with light chains. In this case, monoclonal immunoglobulins are detected, in which there is only a fragment of the heavy chain. The number of normal immunoglobulins of various classes is reduced. Depending on the specific variant of heavy chain disease, high – precision analysis-paraprotein immunofixation can detect alpha, gamma, or mu chains. In the case of BTC-α, fragments of alpha chains can be detected not only in the blood and urine of patients, but also in the mucosa of the small intestine, as well as in the saliva of patients. In some cases, immunocytochemical diagnostics does not allow to establish the correct diagnosis due to the absence of pathological proteins in the blood serum at the time of examination.

Differential diagnosis of heavy chain diseases is performed with lymphoblastic lymphomas, acute and chronic leukemias, autoimmune hemolytic anemia, immunodeficiency disorders of various etiologies, autoimmune diseases, and malignant neoplasms. During the diagnostic process, a hematologist, oncologist, allergist-immunologist, infectious diseases specialist and other specialists are consulted, an endoscopic examination of the stomach and duodenum 12, large intestine, respiratory tract is performed, if necessary – computed tomography of the chest, intestines, pelvis, ultrasound of the abdominal cavity and thyroid gland, as well as other studies.

Treatment of heavy chain diseases

Currently, there are no effective treatments for heavy-chain diseases. If indicated, combined chemotherapy may be used for chronic lymphocytic leukemia and malignant non-Hodgkin's lymphomas (administration of cyclophosphamide, doxorubicin, prednisone, and other drugs in accordance with the selected treatment protocol option). Sometimes a good, but short-term positive therapeutic effect is recorded with local irradiation of the spleen and lymph nodes.

In the case of alpha-heavy chain disease, in some cases, it is possible to achieve good results when using long-term antibacterial therapy with penicillin and tetracycline drugs, as well as metronidazole for 6-9 months during the acute period. In the same form of the disease, radiation therapy is sometimes prescribed in combination with taking glucocorticoid hormones.

Literature:

1. MATNAZAROVA, G., MIRTAZAEV, O., BRYANTSEVA, E., ABDUKAKHAROVA, M., NEMATOVA, N., & KHAMZAEVA, N. (2020). The new coronavirus-COVID-19 in Uzbekistan. *International Journal of Pharmaceutical Research (09752366)*, *12*(4).
2. Mirtazayev, O. M., Briko, N. I., Matnazarova, G. S., & Saidkasimova, N. S. (2019). Scientific, methodological and organizational bases of management of the epidemic process in case of salmonellous infection in Uzbekistan. *Central Asian Journal of Medicine*, *2019*(4), 72-80.
3. Toshtemirovna, K. N., Islamovna, S. G., & Sultanovna, M. G. (2023). The Effectiveness Of A New Food Substance-A Hard Gelatin Capsule-" Sedan Bark" Is Being Studied In Children Who Have Recovered From The Coronavirus. *British View*, *8*(3).
4. Khamzaeva, N. T., & Saidkasimova, N. S. (2023). THE EFFECTIVENESS OF A NEW FOOD SUBSTANCE-A HARD GELATIN CAPSULE-«VIZION JUNIOR» IS BEING STUDIED IN CHILDREN WHO HAVE RECOVERED FROM THE CORONAVIRUS. *World Bulletin of Public Health*, *20*, 41-45.
5. Salomov, S., Aliyev, X. M., Rakhmanov, P. P., Ashurova, M. D., & Makhamatov, U. S. (2022). HISTOSTRUCTURE OF THE GASTRIC MUCOUS MEMBRANE OF RATS WITH A SINGLE PROTEIN DIET. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *2*(4), 14-16.
6. Ashurova, M. D., Makhamatov, U. S., Saydullaeva, K. M., Valiyev, A. L., & Isroilov, F. I. (2023). Determining the health of children and adolescents. In *BIO Web of Conferences* (Vol. 65, p. 05029). EDP Sciences.
7. Махаматов, У. Ш., Ашурова, М. Д., Тешабоев, У. А., & Сайдуллаева, К. М. (2022). РАЗВИТИЕ ДИАБЕТА У БОЛЬНЫХ ИНФЕКЦИЕЙ COVID-19. *Евразийский журнал медицинских и естественных наук*, *2*(5), 13-18.
8. Ashurova, M. D., Makhamatov, U. S., Teshaboyev, U. A., & Saydullayeva, K. M. (2023). THE PLACE AND ROLE OF HEALTHY AND HIGH-QUALITY NUTRITION IN STUDENTS'MASTERY OF EDUCATIONAL ACTIVITIES. *Ethiopian International Journal of Multidisciplinary Research*, *10*(11), 506-508.
9. Ashurova, M. D., Maxamatov, U. S., Teshaboyev, U. A., & Saydullayeva, K. M. (2023). NEGATIVE CONSEQUENCES OF POOR AND IRREGULAR DIET AND RECOMMENDATIONS FOR HEALTHY DIET. *Ethiopian International Journal of Multidisciplinary Research*, *10*(11), 509-512.
10. Гарифулина, Л. М., Ашурова, М. Д., & Гойибова, Н. С. (2018). Совершенствование терапии метаболического синдрома у подростков при помощи применения α-липоевой кислоты. *Наука, техника и образование*, (10 (51)), 69-72.
11. Норматова, Ш. А., Ашурова, М. Д., Эрматова, Г. А., Хожиматов, Х. О., Султонов, Г. Н., & Болтабоев, У. А. (2014). Актуальные проблемы экологии и здоровья населения в Узбекистане. *Актуальные проблемы гуманитарных и естественных наук*, (5-2), 208-211.
12. Гарифулина, Л. М., Ашурова, М. Д., & Тураева, Д. Х. (2019). Характер питания и качество жизни детей с экзогенно-конституциональным ожирением. *Достижения науки и образования*, (10 (51)), 46-49.

13. Ashurova, M. D., Makhamatov, U. S., Teshaboyev, U. A., & Saydullayeva, K. M. (2023). THE PLACE AND ROLE OF HEALTHY AND HIGH-QUALITY NUTRITION IN STUDENTS'MASTERY OF EDUCATIONAL ACTIVITIES. *Ethiopian International Journal of Multidisciplinary Research*, *10*(11), 506-508.
14. Ашурова, М. Д., & Мадрахимова, З. М. (2019). Влияние производственных факторов и образа жизни на состояние здоровья работающих. In *НАУЧНЫЕ ИССЛЕДОВАНИЯ И РАЗРАБОТКИ 2019 ГОДА* (pp. 134-143).
15. Ashurova, M. D., & Rahmatullaev, I. R. (2024). UNPLEASANT COMPLICATIONS OF INFECTIOUS OBESITY. *International Multidisciplinary Journal for Research & Development*, *11*(01).