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THE SIGNIFICANCE OF IMMUNOLOGICAL MARKERS IN PATIENTS WITH β - THALASSEMIA

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SUMMARY

The purpose of beta-thalassemia is to analyze patients taking ferritin and cytokine. Scientific novelty: For the first time, the cytokine status and the relationship between ferritin indicators and general morbidity were studied.The study continued gallbladder thalassemia in 200 patients and laboratory tests. 2nd and 6th interdisciplinary training on domestic violence.

Ferritin, a cultural and universal institution, certainly allows for wellness therapy.

Key words

Hemosiderosis, interleukin, ferritin, chelator therapy.

Introduction: Thalassemias are a heterogeneous group of diseases in which the synthesis of one or more globin chains is disrupted, the production of normal hemoglobin is partially or completely inhibited, and severe anemia develops [1,3]. The clinically important types and the most common are α thalassemia (D56) and β thalassemia (D56.1). Thalassemia, in which the synthesis of the β-chain of globin is impaired, is called β-thalassemia. This type of thalassemia is more common than others. In δ-thalassemia, the synthesis of the α-chain is impaired. Cases of γ-, δ- and β δ-thalassemia have also been described, in which the synthesis of the same globin chains is impaired.

Thalassemia occurs in the Mediterranean basin, the Middle East, South and East Asia, the South Pacific and Southern China, with disease gene carrier rates ranging from 2% to 25%. More than 70% of newborns affected by sickle cell disorders are born each year in sub-Saharan Africa [1,6].

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Despite the lack of reliable information regarding the situation in many regions of the world, according to recent data, about 7% of the total world population are carriers of hemoglobin disorder genes.

Today, hemoglobinopathies are not limited to any particular region, but are widespread diseases throughout the world and represent a global public health problem. Hemoglobinopathies have spread due to population migration from endemic areas to countries where they were extremely rare among indigenous people.

The purpose of the study was to study ferritin levels and cytokine status indicators in patients with β-thalassemia, and to analyze the effectiveness of chelation therapy.

Scientific novelty: For the first time, the cytokine status and the relationship between ferritin levels and overall morbidity were studied.

Materials and methods: The studies were carried out on the basis of the Republican Scientific Research and Clinical Center in collaboration with the Republican Institute of Human Immunology and Genomics of the city of Tashkent, where the level of the studied cytokines was determined. In total, 200 patients with thalassemia, who were registered at the Republican Specialized Scientific and Practical Medical Center for Hematology, participated in the research. Gender distribution revealed that in the main group there were 61 female and 141 male patients.

Results and discussion: Since thalassemia is a hematological disease, specialized care is provided in hematological institutions.

As you know, there are 14 regions in Uzbekistan, and about 10-15 new cases of thalassemia are registered annually. The absence of chelation therapy (the drug Deferasirox (Exjade)) leads to hemosiderosis of internal organs (accumulation of excess iron) and death. Every year, about 10-12 patients die before reaching adolescence. In recent years, mortality has been reduced due to chelation therapy. The highest prevalence of thalassemia was noted in Surkhandarya, Kashkadarya, Samarkand, and Bukhara regions.

As of 2022, there are 238 patients registered at the dispensary at the RSSPMCH; compared to 2015, 154 patients with a diagnosis of β-thalassemia were registered. This situation indicates the urgent need for prenatal diagnostics in our republic; these regions require the greatest attention, especially in terms of preventing consanguineous marriages. It is known that consanguineous marriages increase the risk of developing thalassemia; according to our data, it is in these regions that a high prevalence of consanguineous marriages is noted.

It is known that chelation therapy (CT) is used for thalassemia, the main purpose of which is to maintain safe iron concentrations in the body. Since 2015, the

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drug Exjad has been supplied to our republic; patients with thalassemia are provided with the drug at the expense of public funds. All patients at their place of residence or at the RSSPMCH receive the following medical care at the expense of budgetary funds (i.e. free of charge): examination, basic therapy (transfusions of washed/thawed red blood cells), accompanying therapy (vitamins, hormones, hepatoprotectors, symptomatic therapy, etc. .), free hospitalization. We studied the effectiveness of chelation therapy in patients with thalassemia in 2015-2020. The study of retrospective and reporting data and comparison of the age grid of patients with thalassemia before and after the introduction of chemotherapy showed that during the time after the introduction of chemotherapy in the republic, the number of adolescents and adults who previously did not live to this age increased almost 2 times. The number of young children decreased by 3 times, the number of preschool and school-age children increased significantly, which also indicates a decrease in mortality at this age. To date, there are 36 adult patients over 17 years of age registered. Thus, the introduction of chemotherapy made it possible to increase the life expectancy of patients and reduce mortality. Before chelation therapy, about 10-15 children with thalassemia died annually in the republic; during the years of the introduction of chemotherapy, only 9 children died, and in 2021, 3 patients died. The cause of death was various infections, while the total number of patients with thalassemia during the years of introduction of chemotherapy (2015-2022) increased by 44, which also indicates a decrease in mortality among them. Constant chelation therapy at the initial stage of diagnosing thalassemia allows you to maintain the level of iron in the body at a safe level and thereby prevent iron intoxication, prevent the development of hemosiderosis and, accordingly, dysfunction of internal organs. In the absence of chelation therapy, usually by the age of 5-6 years, almost all patients with thalassemia develop severe hemosiderosis, with an average life expectancy of 6-8 years. The main indicator of the development of hemosiderosis is the level of blood ferritin. We studied the indicators of ferritin, cytokine profile, in particular the indicators of interleukins 2 and 6 in patients with thalassemia receiving chelation therapy.

The results obtained are presented below.

Table №. 1

Serum ferritin indicators in patients with thalassemia in the dynamics of chelation therapy

indicators	**Before chelation therapy**	**4 months after chelation therapy**	**8 months after chelation therapy**	**12 months after chelation therapy**
ferritin	32870 ng/ml	21708,1 ng/ml	12905,9 ng/ml	7626,8 ng/ml

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As shown in the table, ferritin levels before chelation therapy were increased hundreds of times compared to the norm; 4 months after chelation therapy, ferritin levels decreased by 1.5 times, after 8 months by 2.5 times, after a year by 4 times ($p< 0.05$). Thus, the results obtained indicate the high effectiveness of chelation therapy, and also allow us to predict the dynamics of ferritin levels in patients with thalassemia. Data on the increased susceptibility of thalassemia patients to infections arouse great interest in the study of various aspects of the immune status of patients.

The results indicate that interleukin 2 (IL 2) values averaged 123.6 ± 114.1 IU/ml, and interleukin 6 (IL6) values averaged 241.4 ± 43.2 pg/ml.

Normally, interleukin 2 is 158-623 IU/ml, interleukin 6 is 3.40-5.90 pg/ml. Thus, in our studies, the readings of interleukin 2 are increased compared to the norm by 2-3 times, interleukin 6 by hundreds of times. This may be due to hemosiderosis, which is confirmed by a significant increase in ferritin levels. The results obtained indicate the need to study the relationship between hemosiderosis and interleukins 2 and 6.

When studying interleukins in patients with thalassemia, we found an increase in the concentration of IL-2 and 6 in the blood serum, which indicates a shift in the production of interleukins towards pro-inflammatory ones.

Conclusion: A relationship has been identified between ferritin levels and overall morbidity, which makes it possible to predict the level of interleukins during chelation therapy. When studying interleukins 2 and 6 in the blood serum of patients, a significant increase in their levels was revealed, which indicates an immunodeficiency state.

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