engaged in poor lifestyle choices, with 60% not engaging in physical activities as required and a significant portion consuming diets high in saturated fats and processed food.

These findings underscore the need for enhanced cholesterol screening and health education. Improving awareness and promoting healthy behaviours and utilizing technology, such as mobile apps for tracking health metrics, can encourage ongoing engagement with personal health. Addressing these issues proactively may lead to better health outcomes and a decrease in the prevalence of cardiovascular diseases in the long term.

LITERATURE

1. Lipid Disorders and Cardiovascular Risk: A Comprehensive Analysis of Current Perspectives, Editors: Alexander Muacevic, John R Adler, National Library of Medicine.

2. Changes in total cholesterol level and cardiovascular disease risk among type 2 diabetes patients Article Published: 23 May 2023.

3. Correlates of Blood Pressure and Cholesterol Level Testing Among a Socially-Disadvantaged, National Library of Medicine Int J Environ Res Public Health. – 2020. – № 17 (6). – P. 21–23.

4. CDC and prevention 24/7; Improvements in Blood Pressure Among Undiagnosed Hypertensive Participants in a Community-Based Lifestyle Intervention Prev Chronic Dis. – 2014. – № 11. – P. 130269.

5. Public perceptions and knowledge of cholesterol management in a multi-ethnic Asian population: A population-based survey; 13 Aug 2021 National Library of Medicine/

6. World Health Organization. (2021) [web]. Cardiovascular Diseases (CVDs). – URL: https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds) (date of access: 28.02.2025).

УДК 616.155.195.125-074

Abdullah Reem

Scientific Supervisor: Ph.D., Associate Professor S. A. Khoduleva

Educational Establishment
«Gomel State Medical University »
Gomel, Republic of Belarus

INITIAL DIAGNOSIS OF β-THALASSEMIA

Introduction

Thalassemia is a group of inherited blood disorders that result in problems with synthesis of hemoglobin. Symptoms of thalassemia can range from mild to severe they include anemia, fatigue, deformed bones, splenomegaly, jaundice and dark urine. In children, the disease can cause growth retardation. There are two main types of thalassemia: alpha thalassemia and beta thalassemia. The severity of the disease depends on how many of the alpha or beta globin genes are missing. Laboratory tests including complete blood count and genetic tests are used to diagnose thalassemia. Diagnosis can be made before birth through prenatal testing. Thalassemia is most common among people of Greek, Italian, Middle Eastern, South Asian, and African descent. The disease affects approximately 280 million people worldwide, representing about 3.5% of the world's population, of whom about 439,000 have severe thalassemia [1,2]. Thalassemia has the greatest impact on children, as it is an inherited disorder and usually manifests itself early in life. Children with the severe form of thalassemia, known as beta thalassemia (or thalassemia major), begin to show symptoms as early as the first two years of life. These children require intensive medical supervision and regular blood transfusions. Women with thalassemia may also experience certain problems, especially during pregnancy, and require special medical care to minimize the risks to both mother and child. Clinically, the most significant is β-thalassemia, which is characterized by significant clinical, biochemical and genetic polymorphism. Symptoms depend on the form of thalassemia, which can be major

(homozygous form), intermediate, minor. According to WHO, about 1.5% of the world's population are carriers of the beta-globin gene, and at least 40,000 children with thalassemia are born annually. Thalassemia is widespread in the Mediterranean basin, the Middle East, Transcaucasia, and the countries of Southeast and Central Asia. Active migration processes have contributed to the spread of thalassemia throughout the world, including Belarus, where it accounts for 12.5% of all cases of hemolytic anemia. Minor and minimal forms of thalassemia can be diagnosed for the first time at any age. Due to morphological similarities, they can be mistaken for iron deficiency anemia (IDA). However, thalassemia has certain laboratory markers that allow one to confirm the correct diagnosis [3,4,5].

Goal

To identify initial diagnostic markers of ß- thalassemia in children.

Material and methods of research

In our study, we evaluated the laboratory characteristics during the initial diagnosis of thalassemia. Clinical and laboratory data of 77 patients with various forms of hemolytic anemia (HA) aged 1 month to 18 years, with a mean age of 4.9 years, were analyzed. The patient population predominantly comprised boys in a 2:1 ratio. The HA diagnosis was based on anamnesis data and laboratory indicators of hemolysis: reticulocytosis in peripheral blood, increased levels of free bilirubin, and total lactate dehydrogenase (LDH), with decreased haptoglobin in biochemical blood analysis. We also determined the morphological characteristics of anemia based on erythrocyte indices: mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC). Verification of a specific type of HA was performed using additional laboratory tests that specified the type of hemolysis. The diagnosis of hereditary spherocytosis (HS) was based on a decrease in the osmotic resistance of erythrocytes in blood samples before and after daily incubation. Thalassemia diagnosis was confirmed by hemoglobin electrophoresis, showing decreased HbA levels and compensatory increases in HbF and HbA2. Enzyme pathologies were diagnosed based on a decrease in the activity of intraerythrocyte enzymes. The diagnosis of autoimmune hemolytic anemia was established with a positive Coombs test.

Statistical data processing was performed using the SPSS software package. The Mann-Whitney test was used for evaluating differences between groups for two independent samples. Significance level was determined at $p<0.05$.

The results of the research and their discussion

Among all HA cases, inherited variants predominated with 57 patients, accounting for 74% of cases. Hereditary spherocytosis (HS) was the most common inherited variant. Thalassemia accounted for 21.3% (n=12) of cases. Thalassemia was more frequently observed in girls in a 2:1 ratio. The mean age at diagnosis was 4.9 years. Initial evaluation of peripheral blood parameters in thalassemia patients revealed mild anemia, with a median Hb level of 100.8 g/L (range: 87.6–128 g/L) and a mean erythrocyte count of 5.08×10^12/L (range: 3.34–6.02×10^12/L). Notably, one patient aged 1 year had severe anemia (Hb 40 g/L), while three children under 1 year (17.6% of cases) had mild anemia. Analysis of erythrocyte indices showed that the MCV in thalassemia was 61.2 fl (range: 53.6–74 fl). Statistically significant differences in MCV were observed when comparing thalassemia with HS (z=4.57; p<0.0001), enzymopathies (z=4.57; p<0.0001), and autoimmune HA (z=–4.17; p<0.0001). Similarly, the median MCH in thalassemia was 19.6 pg (range: 17.8–26.3 pg), which was significantly lower than in other forms of HA. Target cells were observed in 88.2% of peripheral blood smears. HA is typically hyperregenerative, as indicated by increased reticulocyte counts (Ret) over 5%. The median Ret in thalassemia was 9.2% (range: 3.5–15%). Biochemical hemolysis markers in thalassemia

showed the following median values: total bilirubin – 20.1 μmol/L (range: 4.9–40.4 μmol/L) and LDH–289.3 U/L (range: 174–469 U/L). Significant reductions in haptoglobin levels were observed in 70.5% of cases. Hemoglobin electrophoresis revealed the following average values of hemoglobin fractions: HbA – 52.6% (range: 0.292–91.3%), HbF – 2.9% (range: 0–9.2%), and HbA2 – 2.7% (range: 0.023–6.3%). These results played a crucial role in confirming the diagnosis of thalassemia. Most patients (70.6%) were diagnosed with ß-thalassemia minor, with only one case of severe thalassemia diagnosed at the age of 1 year in a girl with a family history of major beta-thalassemia (father).

Conclusion

In the structure of HA in children, ß-thalassemia accounted for 21.3%. Only one severe case was diagnosed. Initial diagnosis of thalassemia was characterized by morphological similarities to IDA (microcytic hypochromic type, in some cases – normoregenerative). A characteristic feature of thalassemia was the presence of target cells in 88.2% of peripheral blood smears and 100% of laboratory biochemical signs of hemolysis. The main confirmatory test was a decrease in HbA level with an average value of 52.6%, as determined by hemoglobin electrophoresis.

LITERATURE

1. *Baranova, K.* Alkaline phosphatase activity in neutrophils from patients with severe congenital neutropenia (Kostmann syndrome) / K. Baranova // International Journal of Hematology. – 1999. – Vol. 70, No. 4. – P. 236–240.

2. Centers for Disease Control and Prevention (CDC). Thalassemia [web]. – URL: https://www.cdc.gov/thalassemia/index.html (date of access 21.02.2025).

3. Hemorrhagic diathesis: Textbook and methodological manual / Z. V. Grekova, E. G. Malaeva, S. A. Khoduleva [et al.] // Gomel: Educational Institution “Gomel State Medical University”; 2017. – 76 p.

4. *Musallam, K. M. I*ron overload in β-thalassemia intermedia: an emerging concern / K. M. Musallam, M. D. Cappellini, A. T. Taher // Current Opinion Hematology. – 2013. –№ 20 (3). – P. 187–192.

5. *Taher, A. T.* Thalassaemia / A. T. Taher, D. J. Weatherall, M. D. Cappellini // The Lancet. – 2018. – Vol. 391. – №. 10116. – P. 155–167.

УДК 616.36-004-08

Mohammed Elghali, Hashma Abdul Sattar, Yulia Gasanalieva

Scientific supervisor: Ph.D., Associate Professor E. G. Malaeva

Educational Establishment
«Gomel State Medical University»
Gomel, Republic of Belarus

CIRCLES OF HEALING: THE JOURNEY THROUGH LIVER CIRRHOSIS

Introduction

Cirrhosis is the outcome of chronic Liver disease of any etiology due to progressive Liver injury and fibrosis. Consequently, cirrhosis leads to portal hypertension and Liver dysfunction, progressing to complications like ascites, variceal bleeding, hepatic encephalopathy, hepatorenal syndrome, hepatopulmonary syndrome, cirrhotic cardiomyopathy, sarcopenia, hepatocellular carcinoma, and coagulation disorders. End-stage liver disease leads to an impaired quality of life, loss of social and economic productivity, and reduced survival [1]. Among the leading causes of death liver cirrhosis took the spot number 12 in 2021 when deaths from this disease reached 1.3 M and thus 1.9% in total. Liver cirrhosis is accompanied by complications such as portal hypertension (ascites, esophageal varices, portal hypertensive gastropathy), hepatic encephalopathy, hemorrhagic diathesis and bleeding, acute kidney injury, cardiac rhythm and conduction disorders [2–4]. Early detection and management of the underlying causes are crucial to slowing the progression of the disease and improving patient outcomes.