

Qualitative Characteristics Of Laboratory Data In Patients With Celiac Disease

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Abstract

The material is based on an analysis of modern scientific publications, clinical observations, and laboratory data from patients diagnosed in gastroenterology and pediatric departments in Uzbekistan.

Keywords. Serological markers, vitamin D deficiency, gastroenterology, pediatric pathology, autoimmune diseases, population characteristics.

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1. Introduction

The issue of diagnosing celiac disease in Uzbekistan remained poorly studied for a long time, and this was explained not so much by the rarity of the disease, but by the insufficient level of alertness among practicing doctors. Back in the early 2000s, many chronic dyspeptic conditions in children were regarded as consequences of intestinal infections, fermentopathy or nutritional disorders. Meanwhile, the gradual introduction of serological research methods made it possible to look at the problem differently.

Over the past ten years, dozens of cases of confirmed celiac disease have been reported in Tashkent, Samarkand, Bukhara and the Fergana Valley in patients of various age groups. Some experts indicate that the real prevalence of the disease may be significantly higher than official figures. This is due to the large number of latent and atypical forms, in which patients are observed for years by hematologists, endocrinologists or neurologists without receiving a primary diagnosis. Laboratory tests play a special role in

identifying the disease. They are the first signal that makes the doctor suspect celiac enteropathy.

In Uzbek populations, the most common laboratory abnormalities are persistent iron deficiency anemia, decreased serum iron, hypocalcemia and folic acid deficiency. Interestingly, some patients have virtually no intestinal complaints. A child may only complain of weakness, fatigue or decreased performance at school, but a biochemical blood test already shows severe metabolic disorders.

Given the high prevalence of bakery products in the traditional diet of the population, the course of the disease often becomes chronic. Wheat and products made from it occupy a significant part of the daily diet, especially in rural areas, where flatbread and flour dishes are consumed several times a day. This creates a constant antigenic load on the small intestinal mucosa in genetically predisposed individuals. Against this background, atrophy of the intestinal villi gradually forms and malabsorption syndrome develops.

Laboratory data begin to reflect profound disturbances in the metabolism of proteins, trace elements and vitamins. In recent years, interest in the study of autoimmune diseases of the gastrointestinal tract has increased in the republic. Publications have appeared devoted to the peculiarities of the course of celiac disease in children of Uzbek nationality. It is noted that the disease is often combined with other immunopathological conditions, including type 1 diabetes mellitus and autoimmune thyroiditis.

This makes diagnosis even more difficult. The study of the qualitative characteristics of laboratory parameters in celiac disease has not only theoretical, but also practical significance. It makes it possible to determine early diagnostic criteria, reduce the risk of late detection of the disease and increase the effectiveness of therapy in patients of the Uzbek population.

In recent years, celiac disease in Uzbek populations is increasingly considered not only as a gastroenterological problem, but also as a multisystem disease that affects almost all types of metabolic processes. When laboratory data from patients is analyzed, it becomes noticeable that the disease is rarely limited to one indicator. More often, a whole complex of changes is formed, which gradually reflects the depth of damage to the mucous membrane of the small intestine.

In clinics in Tashkent and Samarkand for the period 2019–2024, there was an increase in the number of patients referred for serological examination for chronic anemia of unknown origin. In some patients, the diagnosis of celiac disease was confirmed several years after the first symptoms appeared. This suggests that laboratory indicators often become the only objective guide.

The most consistent change is considered to be a decrease in hemoglobin levels. In some observations, in children of primary school age, hemoglobin decreased to 78–85 g/l, although there were practically no pronounced intestinal symptoms. It's interesting that many parents have long associated their child's weakness solely with workload at school or a lack of vitamins. An in-depth examination revealed a deficiency of iron, ferritin and folic acid.

Such cases are especially typical in rural areas, where specialized diagnostics are limitedly available. Doctors have to focus specifically on a combination of laboratory abnormalities. It is noted that patients of Uzbek nationality often have a mixed type of anemia. In addition to the iron deficiency component, there are signs of protein metabolism disorders and hypovitaminosis. This creates a

more severe clinical picture. In some cases, total protein levels dropped to 52–55 g/l. For a growing organism, such changes are especially dangerous, since they affect the processes of physical development.

Observations show that children with late diagnosed celiac disease often have underweight and growth retardation. However, standard treatment with iron supplements does not give the expected effect. Only after prescribing a gluten-free diet do laboratory values begin to gradually stabilize. These dynamics highlight the importance of early laboratory screening among at-risk populations.

Serological diagnostic methods play a special role in assessing the qualitative characteristics of laboratory data in patients with celiac disease. Antibodies to tissue transglutaminase of the IgA class are considered the most informative. In the republican diagnostic centers of Uzbekistan, this analysis began to be actively implemented after 2016, and it was then that the number of confirmed cases of the disease increased. Previously, patients were observed for years with diagnoses of chronic gastritis, enterocolitis or irritable bowel syndrome.

Serological markers have changed the approach to diagnosis. In most patients, anti-tTG levels were 5–10 times higher than normal. In severe cases, the indicators were more than twenty times higher than the reference values. Particularly pronounced changes were detected in children with prolonged malabsorption. Some researchers note that in Uzbek populations there is a relatively high incidence of IgA deficiency, which complicates the diagnosis of celiac disease. In such situations, it is necessary to additionally determine IgG antibodies. This requires large financial costs and is not always available in regional laboratories.

A paradoxical situation arises: the disease is present, clinical manifestations are present, but the lack of a full immunological examination delays the diagnosis. The connection between serological parameters and the severity of morphological changes in the intestine deserves special attention. The higher the antibody titer, the more profound atrophic processes are observed during biopsy of the small intestinal mucosa.

In Uzbek clinics, such studies are still carried out to a limited extent, but the accumulated experience shows the high diagnostic value of an integrated approach. In recent years, evidence has emerged that some patients with autoimmune thyroiditis and type 1 diabetes mellitus also have positive serological tests for celiac disease. This forces specialists to expand indications for screening. Serology is

gradually becoming not an auxiliary, but one of the central methods for diagnosing the disease.

Biochemical blood parameters in celiac disease reflect the degree of malabsorption of nutrients and microelements. In patients of the Uzbek population, hypocalcemia is especially often detected. This is due not only to damage to the intestinal mucosa, but also to insufficient calcium intake from food in part of the population. In conditions of chronic malabsorption, even a complete diet does not ensure normal absorption of minerals.

In children and adolescents, this is manifested by impaired mineralization of bone tissue, pain in the limbs and increased fatigue. Laboratory tests indicate a decrease in calcium levels to 1.8–2.0 mmol/l. At the same time, the concentration of vitamin D decreases. Some doctors have noted cases where a child was initially sent to an orthopedist with suspected rickets-like changes, but later celiac disease was discovered. Such observations once again show the systemic nature of the disease. In addition to calcium, the level of magnesium and zinc decreases. This affects the condition of the skin, hair and immune system. Biochemical blood tests often reveal hypoalbuminemia.

It indicates a pronounced disorder of protein metabolism. Some patients experience increased transaminases, especially ALT and AST. Interestingly, liver changes in celiac disease have long been underestimated. Now gastroenterologists are increasingly paying attention to the so-called “celiac hepatitis”. After switching to a gluten-free diet, liver enzyme levels gradually return to normal.

Such dynamics suggest a direct connection between inflammatory processes in the intestines and the functional state of the liver. In some studies conducted among children in the Tashkent region, an increase in ALT was observed in almost 28% of patients with confirmed celiac disease. These data deserve serious attention.

Significant changes in celiac disease affect immunological parameters. In Uzbek populations, the disease is often accompanied by chronic activation of the immune system.

This is manifested by an increase in the level of circulating immune complexes and an increase in the concentration of pro-inflammatory cytokines. Changes in interleukin-6 and tumor necrosis factor alpha are especially noticeable. Such laboratory signs indicate a long-term inflammatory process in the intestinal mucosa. Some researchers suggest that the dietary habits of the Central Asian population may increase the immune burden in the presence of a genetic predisposition. A large number of flour products, daily

consumption of flatbreads and pasta create constant contact of the body with gluten.

As a result, the immune system functions under conditions of chronic stimulation. In children, this is sometimes accompanied by frequent infectious diseases. Parents complain of constant colds, weakness, and loss of appetite. Laboratory indicators show a decrease in serum iron levels, changes in protein fractions and a decrease in immune resistance. In some patients, relative lymphocytosis is detected.

In more severe cases, there is an increase in ESR and C-reactive protein. It is interesting to observe how, after eliminating gluten, immunological indicators gradually begin to stabilize. After just 6–8 months of a gluten-free diet, the severity of inflammatory reactions decreases. This confirms the autoimmune nature of the disease. Some patients first feel an improvement in their general condition only several months after starting therapy. Sometimes it seems that the body is literally emerging from a state of constant latent inflammation. Such observations are especially important for understanding the systemic nature of celiac disease.

Continuing the study of laboratory data shows that celiac disease in the Uzbek population has its own specific course characteristics. Unlike European countries, where the disease is often diagnosed in the early stages, in Uzbekistan many patients are admitted with severe metabolic disorders. The reason lies not only in limited diagnostics, but also in the peculiarities of the population's perception of the disease. Parents often consider a child's chronic thinness to be a “family trait,” and periodic abdominal pain is associated with diet or seasonal intestinal infections.

As a result, laboratory changes have time to become profound and persistent. Some adolescents show signs of osteopenia. Biochemical parameters confirm a pronounced deficiency of calcium and vitamin D. Interestingly, some patients were observed by endocrinologists for growth retardation before diagnosis. Only later did it become clear that the cause was chronic malabsorption due to celiac disease. Cases like these show how varied the manifestations of the disease can be.

Laboratory diagnosis becomes a kind of bridge between various clinical symptoms. Without it, celiac disease would continue to be a “mask” for many other pathologies. This is especially important for pediatric practice, where early detection of the disease affects the further development of the child. In recent years, gastroenterologists in Uzbekistan

have increasingly raised the issue of the need for screening among children with chronic anemia. This approach can significantly increase the detection of the disease.

Some experts suggest that the real prevalence of celiac disease among the population of the republic is at least several times higher than official statistics. While this hypothesis requires further study, laboratory data are already confirming the existence of the problem.

Analysis of the qualitative characteristics of laboratory data in patients with celiac disease in Uzbek populations shows that the disease is accompanied by pronounced systemic changes in the hematopoietic, immune and metabolic systems. The most significant laboratory signs remain iron deficiency anemia, decreased ferritin levels, hypoproteinemia, hypocalcemia and increased serological markers of autoimmune inflammation.

Antibodies to tissue transglutaminase are of particular diagnostic importance, making it possible to detect the disease even with an atypical course. Studies conducted in various regions of Uzbekistan indicate late detection of pathology in a significant proportion of patients, which is associated with insufficient vigilance and limited availability of specialized laboratory tests. Chronic consumption of gluten-containing foods in combination with genetic predisposition contributes to the formation of a long-term inflammatory process and malabsorption syndrome. Laboratory changes reflect not only the degree of intestinal damage, but also the depth of systemic disorders of the body. After prescribing a gluten-free diet, most patients experience a gradual normalization of biochemical and immunological parameters, which confirms the leading role of nutrition in the pathogenesis of the disease.

The findings highlight the need to expand serological screening among children and adolescents with chronic anemia, delayed physical development and long-term dyspeptic syndromes. The problem of celiac disease in the Uzbek population requires further clinical and laboratory studies and improvement of diagnostic approaches.

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