Assessment of the severity of ulcerative colitis: an effective pathway from invasive to non-invasive diagnosis

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Abstract. The purpose of the study is to study the Diagnostic and prognostic importance of TGF-β2 in patients with ulcerative colitis with different severity. The study received 82 patients with stasionar and outpatient treated ulcerative colitis in the Gastroenterology Department of Bukhara regional Multidisciplinary Medical Center during 2021-2023 and 20 health professionals as a control group. Patients were diagnosed with serum immunoferment analysis using IL-6 and TGF-β2, and its importance was studied. The results of the study showed an increase in IL-6 and a decrease in TGF-β2 in severe types of ulcerative colitis, and found that it could be used in diagnosis as a poor prognostic marker.

1 Introduction

Ulcerative colitis is a chronic cause of unclear inflammation of the large intestine, a continuous superficial inflammation of the mucous membrane, as well as a disease that spreads to varying degrees from the rectum to the upper parts of the large intestine. Ulcerative colitis has the property of relapsing and remitting. Distinguishing signs of ulcerative colitis include a call to urinate and a bloody diarrhea that comes in conjunction with a call to the exit of the litter [1]. Despite the fact that the etiology of ulcerative colitis remains under debate, many data have proven that an autoimmune process lies on the basis. Most patients have common similarities with a number of autoimmune disorders such as involvement of limb damage in the process, with extra-intestinal symptoms of ulcerative colitis observed [2].

A distinctive feature of the epidemiology of ulcerative colitis is the spread of this disease among young people of working age in recent years. European studies have described the impact of ulcerative colitis on the quality and level of life of patients, their work training, their relationship with those around them [3]. More than 25% of patients around the world have problems with frequent toilet access or the need for a garbage collector in their work. Late diagnosis of the disease, severe and severe forms of the disease indicate its high lethality [4].

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Like other inflammatory bowel diseases, there is still no clear cause of ulcerative colitis. The disease is formed as a result of the concomitant arrival of several factors, including a hereditary predisposition, congenital and acquired diseases of the immune system, violation of the intestinal normative microflora and harmful environmental influences. Those of greater importance in them received inflammation TNF-α, IL-6 and anti-inflammatory IL-4 and TGF-β2. TNF-α stimulates the production of IL-6, so that the function of IL-6 is compatible with its activator [5].

Of the anti-inflammatory interleukins, TGF-β2 is a multifunctional anti-inflammatory cytokinin involved in metabolic reactions, apoptosis and migration, stratification processes in target-cells. Every cell in the body, including epithelial, endothelial, nerve and connective tissue cells, produces TGFß. In ulcerative colitis, the synthesis of TGFß2, which denotes regeneration, is reduced as a result of impaired cellular integrity [6].

Assessment of the severity of ulcerative colitis is important for management of treatment and predicting the consequences of the disease. Literature analysis has shown that interleukins analysis in patients with ulcerative colitis has been carried out in large numbers, but given that they can all increase in other diseases, there is a need to develop a special diagnostic method that assesses the severity of the disease [7].

The purpose of the research. A study of the Diagnostic and prognostic importance of IL-6 and TGF-β2 in patients with different severity of ulcerative colitis.

2 Material and methods

The study received 82 patients with stasionar and outpatient treated ulcerative colitis in the Gastroenterology Department of Bukhara regional Multidisciplinary Medical Center during 2021-2023 and 20 health professionals as a control group. The average age of patients is 38.6±4.3 years. Of the 82 patients, 45 were male and 37 were female. The diagnosis of ulcerative colitis was made on the basis of clinical recommendations for the diagnosis and treatment of the disease. To determine the severity of ulcerative colitis, the Truelove, Witts criteria; endoscopic activity indices were applied in Mayo.

According to the standard, all examination methods were carried out, including from laboratory analyzes - general blood analysis, general urine analysis, general stool analysis, blood biochemical analysis (bilirubin, ALT, AST, creatinine, mochevina, glucose), as well as instrumental examinations – colonoscopy.

Immunoferment analysis was carried out in the laboratory of the private clinic “Endomed”. IL - 6 was fired using the” Vector best “(Novosibirsk) reagent package, while TGF-β2 was fired using the” Elabsciece " (USA) reagent package.

Statistical processing of results was done using Statistica 6.1 software packages, using variational statistical methods and non-parametric criteria. The correlation dependence rate was estimated at the Spirmen coefficient (RS). The differences were deemed reliable at $p<0.05$.

3 Results

In order to implement the research goal, the Bukhara regional Multidisciplinary Medical Center conducted an immunoferment analysis in the laboratory of the private clinic “Endomed” of blood serum of patients with ulcerative colitis from gastroenterology.

As a result of the study, it was found that in patients with ulcerative colitis, the concentration of IL-6 cytokine, which calls for inflammation in the blood serum, increases more than 2 and 3 times, respectively, in moderately severe and severe levels compared to practically healthy people (Table 1).

Table 1. Variation in IL-6 levels of ulcerative colitis at different weight levels.

Severity	Patients with ulcerative colitis (n=82)	Control group (n=20)	p
Mild	10,12±2,84	6,85±1,42	0,001
Moderate	14,73±3,32		
Severe	18,05±5,26		

As can be seen from the table, as the severity of ulcerative colitis increased, the amount of IL-6 was observed, and this certainly indicated the activity of the inflammatory process.

In the next phase of the study, serum anti-inflammatory TGF-β2 was identified. Based on the results of the study, it can be seen that TGF - β2 decreased by 2 times in the milder type of ulcerative colitis than in patients in the healthy group, by 3 times in the Middle heavy suppressor, and by almost 10 times in the type of heavy suppressor (Table 2).

Table 2. Variation in TGF-β2 levels of ulcerative colitis at different weight levels.

Severity	Patients with ulcerative colitis (n=82)	Control group (n=20)	p
Mild	5,48±1,54	10,38±3,64	0,001
Moderate	3,73±0,32		
Severe	1,05±0,06		

As can be seen from the table, as the severity of the disease increased, the amount of TGF - β2 decreased, which means that this is due to a decrease in the regenerating properties of the colon mucosa in ulcerative colitis.

In the next phase of the study, the correlation relationship of inflammatory caller - IL-6 and anti - inflammatory-TGF-β2 interleukins with ulcerative colitis severity as well as the index of colonoscopic activity was studied. In this, it was found that there is a strong inverse relationship between IL-6 and TGF-β2, meaning that TGF-β2 activity decreases as IL-6 increases. A strong positive correlation has been found between IL-6, disease severity, and the colonoscopic Activity Index, which means that as the severity of the disease increases, the amount of IL-6 increases accordingly as the index of endoscopic activity increases. A strong negative correlation was found between TGF-β2 disease severity as well as the colonoscopic Activity Index, as evidenced by the fact that as disease severity increases, the amount of TGF-β2 decreases in contrast as the index of endoscopic activity increases, which means that the regenerative, proliferative process has decreased (Table 3).

Table 3. Correlation relationship between index of colonoscopic activity, ulcerative colitis weight level and cytokines.

Indicators	RS	P
IL-6 and TGF-β_2	0,38	0,003
IL-6 and ulcerative colitis severity[1], index of colonoscopic activity[2]	0,27[1]; 0,42[2]	0,03[1]; 0,02[2]
TGF-β2 and ulcerative colitis severity[1], colonoscopic activity index[2]	0,39[1]; 0,31[2]	0,03[1]; 0,02[2]

In patients with ulcerative colitis, an increase in inflammatory-calling cytokines and a decrease in anti-inflammatory cytokines indicate a violation of immunoregulation and control of inflammatory processes. Thus, the greater the spread of the lesion and the more severe the course of ulcerative colitis, the higher the level of inflammatory-calling cytokines, while anti-inflammatory cytokines, on the contrary, are lower.

The examinations carried out in order to choose the tactics of diagnosis or treatment in patients with each chronic disease make them overly exhausting, especially when it comes to invasive examination methods, in terms of whether these methods cause pain or discomfort, most patients refuse to undergo an examination. Also, during screening tests, which are carried out in order to study the health or morbidity of the population, the solution is very complex to perform an endoscopic examination on one patient, and it takes a very large amount of time. This is because in such cases, examination methods that cause little harm to

patients help. Such methods are easy to carry out and require little time, and the main thing is to count on non-invasive methods. Patients with ulcerative colitis are also among such patients, the reason for which the need for non-invasive methods has increased in order to determine the severity of the disease.

4 Conclusion

The study shows that patients with yak have been diagnosed with immune system dysfunctions in the form of an increase in inflammatory-calling cytokin IL-6 and a decrease in anti-inflammatory TGF-β2. This contributes to the preservation and development of the inflammatory process in the colon wall and leads to its destruction. The Association of cytokine profile disorders with ulcerative colitis severity confirms the close relationship of inflammatory and angiogenesis processes. Hence, it can be concluded that these cytokines have an advantage over invasive examination methods during the screening examination of the disease and can serve as an effective diagnostic and prognostic marker in assessing the severity of the disease in patients.

The results obtained make it possible to use IL-6, TGF-β2 as always available, non-traumatic methods for determining the level of cytokine and assessing the severity of the inflammatory-destructive process in patients with ulcerative colitis.

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