

**MODERN POSSIBILITIES IN THE DIAGNOSIS OF PERITONITIS**

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Peritonitis is one of the most serious and life-threatening conditions in abdominal surgery and clinical medicine. This disease is characterised by inflammation of the peritoneum, accompanied by a pronounced systemic inflammatory response, rapid progression and a high risk of developing multiple organ failure. Despite the significant achievements of modern medicine, the mortality rate for peritonitis remains high and, according to various authors, ranges from 10 to 40%, and in widespread and postoperative forms can exceed 50% [1,2].

The relevance of the problem of peritonitis is due not only to the severity of the clinical course, but also to the variety of its aetiological factors. Peritonitis can develop as a complication of acute surgical diseases of the abdominal organs (appendicitis, perforation of gastric and duodenal ulcers, intestinal obstruction), trauma, postoperative complications, as well as infectious processes, including peritonitis associated with peritoneal dialysis. The variety of causes and clinical forms of the disease significantly complicates timely diagnosis [3,4].

One of the key problems in the management of patients with peritonitis remains early diagnosis, as the clinical manifestations of the disease in the early stages may be blurred or nonspecific. In some cases, the symptoms of peritonitis are masked by other acute abdominal conditions, leading to diagnostic errors and delays in the initiation of adequate treatment. It is known that every hour of delayed diagnosis directly worsens the prognosis of the disease and increases the risk of death [7,8].

Traditionally, the diagnosis of peritonitis was based on clinical examination of the patient and laboratory test data, such as complete blood count and biochemical indicators of inflammation. However, in recent years, it has been proven that the isolated use of clinical and standard laboratory methods does not always allow for the accurate determination of the presence, extent, and severity of the inflammatory process in the abdominal cavity. In this regard, the role of modern diagnostic technologies aimed at the early detection of peritonitis and its complications is increasing [4,9].

Modern medicine has a wide range of instrumental diagnostic methods at its disposal, including ultrasound examination, computed tomography and magnetic resonance imaging, which allow pathological changes in the abdominal cavity to be visualised with high accuracy. Computed tomography is considered the most informative method in most clinical situations, providing a detailed assessment of the focus of inflammation, the presence of free gas, fluid, and abscesses [5].

In recent years, particular attention has been paid to the development of laboratory and molecular diagnostic methods, including the determination of specific markers of inflammation, such as procalcitonin, interleukins, and matrix metalloproteinases. These indicators not only confirm the presence of an inflammatory process, but also assess its severity and predict the course of the disease. In addition, the introduction of rapid point-of-care tests significantly reduces the time required to make a diagnosis, which is crucial in emergency care settings [6].

Thus, modern diagnosis of peritonitis is a complex and multi-level process that requires the integration of clinical data, laboratory indicators, and the results of instrumental studies. Continuous improvement of diagnostic approaches and the introduction of innovative technologies are key factors in reducing mortality and improving disease outcomes. In this regard, the study of modern possibilities for the diagnosis of peritonitis remains a relevant and significant task of modern clinical medicine [8,9,10].

Laboratory diagnosis of peritonitis is one of the key components of a comprehensive examination of a patient and is aimed at identifying the inflammatory process, assessing its severity, nature, and possible complications.

Laboratory indicators allow objectification of the clinical picture, confirmation of the presence of a systemic inflammatory response, and determination of the severity of the patient's condition [22,24].

A complete blood count remains the basic and most accessible method of laboratory diagnosis of peritonitis. This disease is characterised by: leukocytosis with a left shift in the leukocyte formula, neutrophilia, and an increased erythrocyte sedimentation rate (ESR). The severity of leukocytosis often correlates with the extent of the inflammatory process. However, in severe forms of peritonitis, especially in elderly patients and individuals with immunodeficiency conditions, the development of leukopenia ( ) is possible, which is an unfavourable prognostic sign [15,17].

Laboratory diagnosis of peritonitis plays an important role in confirming the inflammatory process, assessing its systemic nature and severity. In recent years, particular importance has been attached to blood biochemical parameters, which reflect the intensity of the inflammatory response, the severity of tissue hypoxia, and the development of organ dysfunction. Biochemical markers not only confirm the diagnosis but also assess the dynamics of the disease and the effectiveness of the

therapy [12,13,14].

Among the biochemical indicators, C-reactive protein (CRP) is of particular importance as a sensitive marker of acute inflammation. Patients with peritonitis show a significant increase in CRP levels, with its concentration reflecting the dynamics of the inflammatory process and the effectiveness of the therapy [8,11,24].

Another important marker is procalcitonin, which is considered a more specific indicator of bacterial infection and septic conditions. An increase in procalcitonin levels allows one to differentiate bacterial peritonitis from aseptic inflammation, assess the risk of developing sepsis, and predict the severity of the disease. Elevated procalcitonin levels correlate with disease severity and may serve as a basis for early initiation or adjustment of antibiotic therapy [11,12,13].

In common forms of peritonitis, multiple organ failure syndrome often develops. In this regard, laboratory diagnostics include determining: creatinine and urea levels to assess kidney function, liver enzyme activity (ALT, AST), and blood lactate concentration, which reflects the degree of tissue hypoxia. Elevated lactate levels are considered an unfavourable prognostic factor and indicate a severe course of the disease. In severe forms of peritonitis, pronounced metabolic stress develops, accompanied by microcirculation disorders and tissue hypoxia. In this context, an important biochemical indicator is blood lactate, an increase in which indicates the development of anaerobic metabolism and systemic hypoperfusion. Lactate levels are used as a prognostic marker and are included in algorithms for assessing the severity of patients with sepsis and peritonitis [8,9,10].

The inflammatory process in peritonitis is accompanied by marked activation of the haemostasis system and disruption of water and electrolyte balance, which significantly exacerbates the course of the disease and increases the risk of adverse outcomes. These changes reflect the systemic nature of the inflammatory response and are closely associated with the development of endothelial dysfunction and septic complications [19,22,23].

One of the characteristic biochemical manifestations of peritonitis is hypercoagulation, caused by the activation of the blood coagulation cascade in response to inflammation. An increase in the level of fibrinogen and other acute phase proteins contributes to an increase in blood viscosity and the formation of microthrombi, which leads to impaired microcirculation in tissues [16,17,18].

As the disease progresses and sepsis develops, coagulation factors may be depleted and disseminated intravascular coagulation (DIC syndrome) may form.

Laboratory tests show this as an increase in prothrombin time, an increase in the international normalised ratio (INR), a decrease in platelet count, and an increase in the concentration of fibrin degradation products [14,15].

Assessment of coagulation parameters is of important clinical significance, as it

allows for the timely detection of haemostasis disorders and adjustment of therapy aimed at preventing thrombotic and haemorrhagic complications [14,15,21].

Peritonitis is accompanied by significant changes in water and electrolyte balance associated with severe intoxication, vomiting, intestinal obstruction, and fluid loss into the third space. The most common findings are: hyponatraemia caused by sodium loss and impaired water metabolism regulation, hypokalaemia or hyperkalaemia resulting from metabolic acidosis, renal dysfunction and cell breakdown, and calcium level disorders affecting myocardial contractility and vascular tone [20,21,22].

Electrolyte imbalance has a significant effect on the cardiovascular system and can contribute to the development of arrhythmias, hypotension, and deterioration of the patient's general condition.

Clinical significance of coagulation and electrolyte parameters. Monitoring of haemostasis and electrolyte-y blood composition parameters is an essential part of laboratory testing of patients with peritonitis. These parameters are used to assess the severity of the condition, predict the risk of complications and select the optimal intensive care strategy [1,21,24].

Thus, coagulation and electrolyte disorders are important biochemical markers of the systemic inflammatory response in peritonitis and require timely detection and correction as part of comprehensive treatment [14,15,23].

The differential diagnosis of peritonitis is an important stage of clinical examination, since the symptoms of the disease often overlap with the manifestations of other acute surgical and therapeutic conditions of the abdominal organs. Errors at this stage can lead to a delay in the initiation of adequate treatment and a significant worsening of the prognosis. Laboratory indicators and instrumental examination methods play a key role in differential diagnosis. Elevated levels of procalcitonin and C-reactive protein, combined with signs of inflammation on CT scans, make it highly likely to confirm the infectious nature of the process and distinguish peritonitis from aseptic conditions [9,15,22].

Modern diagnostic capabilities for peritonitis are based on a comprehensive approach that includes clinical examination, laboratory, instrumental, molecular, and rapid testing methods. The use of standard laboratory indicators in combination with extended biochemical analysis allows for an objective assessment of the severity of the systemic inflammatory response, the degree of metabolic disorders, and the development of organ dysfunction. Biochemical markers such as C-reactive protein, procalcitonin, lactate, protein and electrolyte metabolism indicators have high diagnostic and prognostic value and should be considered mandatory components of laboratory monitoring of patients with peritonitis [2,16,18].

**References:**

1. Abduhakimov B. A. et al. Bolalar va o'smirlarda birlamchi tuberkulyozning o'ziga xos kechish xususiyatlari va klinik-laboratoriya usullari //Ta'lim innovatsiyasi va integratsiyasi. – 2024. – Т. 32. – №. 3. – С. 139-143.
2. Бердиярова Ш. Ш. и др. Клинико-лабораторная диагностика фолиевой кислотодефицитной анемии //TADQIQOTLAR. UZ. – 2024. – Т. 49. – №. 3. – С. 46-53.
3. Umarova T. A., Kudratova Z. E., Axmadova P. Role of conditionally pathogenic microflora in human life activities //Web of Medicine: Journal of Medicine, Practice and Nursing. – 2024. – Т. 2. – №. 11. – С. 29-32.
4. Muhamadiyeva L. A., Kudratova Z. E., Sirojeddinova S. Pastki nafas yo'llari patologiyasining rivojlanishida atipik mikrofloraning roli va zamonaviy diagnostikasi //Tadqiqotlar. Uz. – 2024. – Т. 37. – №. 3. – С. 135-139.
5. Umarova T. A., Kudratova Z. E., Norboyeva F. Modern aspects of etiology and epidemiology of giardias //Web of Medicine: Journal of Medicine, Practice and Nursing. – 2024. – Т. 2. – №. 11. – С. 25-28.
6. Isomadinova L. K., Daminov F. A. Glomerulonefrit kasalligida sitokinlar ahamiyati //Journal of new century innovations. – 2024. – Т. 49. – №. 2. – С. 117-120.
7. Umarova T. A., Kudratova Z. E., Maxmudova H. Mechanisms of infection by echinococcosis //Web of Medicine: Journal of Medicine, Practice and Nursing. – 2024. – Т. 2. – №. 11. – С. 18-21.
8. Даминов Ф. А., Исомадинова Л. К., Рашидов А. Этиопатогенгетические и клинико-лабораторные особенности сальмонеллиоза //TADQIQOTLAR. UZ. – 2024. – Т. 49. – №. 3. – С. 61-67.
9. Umarova T. A., Kudratova Z. E., Вахромова М. Autoimmune diseases: new solutions in modern laboratory diagnostics //International Conference on Modern Science and Scientific Studies. – 2024. – С. 78-81.
10. Бердиярова Ш. Ш. и др. Узловой зоб и его клинико-лабораторная диагностика //TADQIQOTLAR. UZ. – 2024. – Т. 49. – №. 3. – С. 38-45.
11. Umarova T. A., Kudratova Z. E., Muhsinovna R. M. The main purpose of laboratory diagnosis in rheumatic diseases //International Conference on Modern Science and Scientific Studies. – 2024. – С. 82-85.
12. Umarova T. A., Kudratova Z. E., Ruxshona X. Contemporary concepts of chronic pancreatitis //International Conference on Modern Science and Scientific Studies. – 2024. – С. 11-15.
13. Хамидов З. З., Амонова Г. У., Исаев Х. Ж. Некоторые аспекты патоморфологии неспецифических язвенных колитов //Молодежь и медицинская наука в XXI веке. – 2019. – С. 76-76.

14. Umarova T. A., Kudratova Z. E., Muminova G. Instrumental diagnostic studies in chronic pancreatitis //International Conference on Modern Science and Scientific Studies. – 2024. – С. 16-20.
15. Атамурадовна М.Л., Рустамовна Р.Г., Эркиновна К.З. Роль современных биомаркеров в изучении различных поражений головного мозга //Достижения науки и образования. – 2020. – №. 10 (64). – С. 88-90.
16. Рустамова Г. Р., Мухамадиева Л. А. Современные аспекты клинико-лабораторных методов исследования острой ревматической лихорадки //International scientific review. – 2020. – №. LXVI. – С. 106-110.
17. Кудратова З.Е. и др. Роль цитокиновой регуляции при обструктивном синдроме атипичного генеза у детей // Анналы Румынского общества клеточной биологии. – 2021. – Т. 25. – №. 1. – С. 6279-6291.
18. Erkinovna K. Z. et al. Bronchial obstruction syndrome in young children with respiratory infections of different etiology: features of clinical manifestations and immune response //Проблемы науки. – 2021. – №. 1 (60). – С. 60-62.
19. Кудратова З.Е. и др. Хламидийные инфекции (внутриклеточная инфекция) в развитии бронхита // TJE-Tematics journal of Education ISSN. – 2021. – С. 2249-9822.
20. Kudratova Z. E. et al. Principles of therapy of chlamydial and mycoplasma infections at the present stage //Вопросы науки и образования. – 2021. – №. 28 (153). – С. 23-26.
21. Rustamova G. R., Kudratova Z. E. CHRONIC ENDOMETRITIS OLD ISSUES NEW POSSIBILITIES //Western European Journal of Medicine and Medical Science. – 2024. – Т. 2. – №. 5. – С. 12-14.
22. Erkinovna K. Z., Rustamovna R. G., Suratovna H. F. LABORATORY MARKERS OF PERINATAL HYPOXIC DAMAGE TO THE CENTRAL NERVOUS SYSTEM IN NEWBORNS //Наука, техника и образование. – 2020. – №. 10 (74). – С. 102-104.
23. Mukhamadieva L. A., Rustamova G. R., Kudratova Z. E. IMMEDIATE RESULTS OF COMPLEX TREATMENT OF CHILDREN WITH CHRONIC TONSILLITIS AND CHRONIC ADENOIDITIS ASSOCIATED WITH CMV AND EBV //Western European Journal of Medicine and Medical Science. – 2024. – Т. 2. – №. 5. – С. 20-24.
24. Umarova T. A., Kudratova Z. E., Norxujayeva A. Etiopathogenesis and modern laboratory diagnosis of prostatitis //International Conference on Modern Science and Scientific Studies. – 2024. – С. 6-10.