EVALUATION OF THE IMMUNE STATUS IN PATIENTS SUFFERING FROM PARASITIC DISEASES IN THE KHOREZM REGION

Masharipova Sh.S., Otajanov Sh.Z., Yoqubov Q.Y., Raximova S.O.
Urgench State Medical Institute, Urgench, Uzbekistan.

Received: 28.11.2025
Revised: 29.11.2025
Accepted: 01.12.2025
Keywords:
parasitic diseases, immune status, enzyme immunoassay, antibodies, antigens.
Ключевые слова:
паразитарные заболевания, иммунный статус, иммуноферментный анализ, антитела, антигены.

Annotation. Parasitic diseases remain a significant global public health concern, particularly in regions with a high incidence and limited access to preventive healthcare. This study presents an analysis of the immune status of 112 patients, including both children and adults, diagnosed with parasitic diseases in the Khorezm region. The immune parameters were assessed using the enzyme-linked immunosorbent assay (ELISA) method, which enabled the evaluation of antigen–antibody interactions and the identification of specific features of the immune response.

The findings revealed varying degrees of immune suppression and imbalance between humoral and cellular immunity, depending on the type and severity of parasitic infection. The results emphasize the importance of monitoring immune indicators in patients with parasitic diseases to improve diagnosis, optimize treatment strategies, and develop effective preventive measures in endemic regions.

Аннотация. Паразитарные заболевания остаются серьёзной проблемой общественного здравоохранения, особенно в регионах с высокой заболеваемостью и ограниченным доступом к профилактической медицинской помощи. В данной работе представлены результаты исследования иммунного статуса 112 пациентов, включая детей и взрослых, у которых были диагностированы паразитарные заболевания в Хорезмской области.

Оценка иммунологических показателей проводилась методом иммуноферментного анализа (ИФА), что позволило выявить особенности взаимодействия антигенов и антител, а также характер иммунного ответа. Полученные результаты показали различные степени иммунодепрессии и дисбаланс между гуморальным и клеточным звеньями иммунитета, зависящие от типа и тяжести паразитарной инфекции. Результаты исследования

подчёркивают важность мониторинга иммунного статуса у пациентов с паразитарными заболеваниями для совершенствования диагностики, оптимизации терапии и разработки эффективных профилактических мер в эндемичных регионах.

Introduction

Parasitic infections remain a major global health concern, affecting millions of people worldwide, particularly in tropical and subtropical regions. These infections are caused by a variety of protozoa and helminths, which can lead to chronic and recurrent diseases with diverse clinical manifestations that negatively impact human health, productivity, and quality of life.One of the key determinants influencing the course, severity, and outcome of parasitic diseases is the functional state of the immune system. The interaction between the parasite and the host's immune response plays a crucial role in the development of pathology, persistence of infection, and susceptibility to reinfection. Understanding these immunological mechanisms provides valuable insights into disease progression and host defense strategies.

Therefore, the study of immune status in patients with parasitic diseases is essential for improving diagnostic accuracy, optimizing therapeutic approaches, and designing effective prevention programs aimed at reducing the disease burden in endemic regions such as the Khorezm region.

The aim of the study was to study the immune status of patients with parasitic diseases in the Khorezm region.

Materials and methods:

The study was conducted on a cohort of 112 patients diagnosed with various parasitic diseases residing in the Khorezm region. The participants included both children and adults with confirmed parasitic infections of different etiologies. All patients underwent a comprehensive clinical examination, and blood samples were collected to assess immunological parameters.

The immune status of the patients was evaluated using the enzyme-linked immunosorbent assay (ELISA) method, which enables the detection and quantitative measurement of specific antibodies in blood serum. This method is based on the specific interaction between antigens and antibodies, allowing for high sensitivity and specificity in identifying immune responses associated with parasitic infections.

In this study, the antigens were immobilized on a solid-phase carrier, specifically on polystyrene microplates. When the patient's serum containing corresponding antibodies was added, antigen–antibody complexes were formed. These complexes were subsequently identified by measuring the colorimetric optical density of the substrate mixture, which varied in proportion to the enzymatic activity and concentration of antibodies present.

For the ELISA procedure, the “BEST” reagent kit was used. This system contains highly purified antibodies, antigens, and calibrated standards, ensuring the accuracy, reproducibility, and reliability of the obtained data. The results were interpreted according to the manufacturer’s guidelines, with quantitative values expressed in international units per milliliter (IU/mL).

The obtained immunological data were statistically processed using SPSS software, with descriptive and comparative analyses applied to evaluate immune parameters among different patient subgroups based on age, type of parasitic infection, and disease severity.

Results:

The results of the study showed significant differences in the immune status among groups of patients with different types of parasitic diseases. It was found that in most cases there was a hyperergic reaction of the immune system, manifested by an increased level of specific antibodies to certain antigens.

In addition, it was observed that children had more pronounced changes in their immune status compared to adults, which may indicate a more sensitive immune response in childhood. A number of patients also had a combination of a hyperimmune response with a hypoimmune one, which indicated possible abnormalities in the regulation of the immune response.

Discussion

The obtained data on the immune status of patients with parasitic diseases allow us to conclude that an individual approach to treatment and prevention is necessary. The identified features of the immune response can serve as a basis for further research aimed at clarifying the mechanisms of interaction between parasites and the immune system.

The introduction of new methods of enzyme immunoassay can significantly improve the diagnosis and monitoring of the therapeutic process in patients with parasitic diseases. Taking into account the variability of the immune response in different age groups, the creation of specialized protocols for children and adults is an urgent task. It is important to take into account that the immune status is influenced not only by the characteristics of the infection, but also by environmental factors, nutrition and concomitant diseases. Additional research aimed at studying the molecular and genetic mechanisms of parasites' interaction with the immune system may open up new opportunities for the development of vaccines and immunotherapies. It is also necessary to focus on studying the dynamics of changes in the immune status at various stages of the disease, which will allow for more precise emphasis in treatment.

At the same time, the development of new biomarkers capable of reflecting the state of the immune response provides a chance to obtain an objective assessment of the effectiveness of therapy. This, in turn, will allow medical professionals to adapt the prescribed treatment in accordance with the individual needs of the patient.

To improve the effectiveness of diagnostics, it is necessary to develop interdisciplinary approaches that combine knowledge from the field of infectious diseases, immunology and genetics. Cooperation between scientific and clinical institutions will provide an opportunity to integrate advanced scientific developments directly into practical healthcare.

For the successful implementation of new techniques and biomarkers, it is also necessary to establish active cooperation between research institutes and pharmaceutical companies. This collaboration will not only speed up the clinical trial process, but also ensure that new tests and treatments are available to a wide audience. Joint efforts in the development of new medicines will also reduce financial barriers to innovation in practice. Equally important is the creation of platforms for the exchange of information and experience among specialists.

Conferences, seminars, and webinars can be effective tools for spreading knowledge about the diagnosis and treatment of parasitic infections. This will allow health workers to keep their skills up to date and share successful practices. Research funding and infrastructure development also play a key role. Public and private investments in healthcare can significantly improve the quality of diagnosis and treatment, ensuring that the latest technologies and knowledge are available to the public.

Conclusion

The enzyme-linked immunosorbent assay (ELISA) has proven to be an effective and informative method for evaluating the immune status of patients with parasitic diseases. The findings of this study emphasize the crucial role of monitoring immune responses as part of both diagnostic assessment and therapeutic management. Regular evaluation of immune parameters allows clinicians to identify immunological imbalances, assess disease progression, and tailor treatment strategies to the individual needs of patients.

Further in-depth research is required to elucidate the complex immunopathological mechanisms underlying parasitic infections and to develop novel approaches for targeted immunocorrection and prevention. The active integration of these findings into clinical practice will contribute to improving the quality of life of patients and reducing the incidence of parasitic diseases in endemic areas, particularly in the Bukhara and Khorezm regions.

In the long term, the harmonization of diagnostic and therapeutic approaches based on established immunological features will enhance the effectiveness of healthcare interventions. Equally important is the continuous education and training of medical personnel. Strengthening their competence in modern diagnostic techniques, immunological assessment, and evidence-based treatment strategies will

significantly improve patient outcomes and the overall quality of medical care in regions with a high prevalence of parasitic diseases.

References

1. SH, Y. S., YOQUBOV, Q., & NURLLAYEV, R. (2025). FEATURES OF THE COURSE OF THE HERPES TYPE 4 VIRUS IN CHILDREN. Multidisciplinary Journal of Science and Technology, 5(3), 397-402.
2. NURLLAYEV, R., SH, Y. S., & YOQUBOV, Q. (2025). PECULIARITIES OF THE ETIOLOGICAL STRUCTURE OF ACUTE DIARRHEAL DISEASES IN THE CONDITIONS OF THE SOUTHERN ARAL REGION. Multidisciplinary Journal of Science and Technology, 5(3), 403-408.
3. Razzokberganova, D. O., Ibragimov, S. J., Bobojonov, Y. B., & Yoqubov, Q. Y. (2025). EPIDEMIOLOGICAL AND CLINICAL CHARACTERISTICS OF ENTEROBIASIS. Multidisciplinary Journal of Science and Technology, 5(2), 665-668.
4. Yoqubov, Q. Y., Bobojonov, Y. B., Razzokberganova, D. O., & Ibragimov, S. J. (2025). FEATURES OF THE COURSE AND SPREAD OF TENIARINCHOSIS DISEASE. Multidisciplinary Journal of Science and Technology, 5(2), 669-672.
5. Sadullaev, S. E., Ibragimov, S. J., Bobojonov, Y. B., Yoqubov, Q. Y., Abdullayeva, D. K., & Khasanova, J. R. (2024). PREVALENCE OF DIARRHEAL DISEASES IN THE REPUBLIC OF UZBEKISTAN. International Journal of Education, Social Science & Humanities, 12(3), 356-363.
6. Аскарова, Р. И., & Отажонов, Ш. З. (2020). Туберкулез на фоне сопутствующей патологии. European science, (3 (52)), 106-108.
7. Отажанов, Ш. З., Худайцулова, Г. К., & Муминова, М. Т. (2019). THE COURSE OF DIARRHEA OF VIRAL ETIOLOGY IN HIV INFECTED CHILDREN. Новый день в медицине, (4), 252-255.
8. Аскарова, Р. И., Атажанов, Ш. З., & Маткурбанов, Х. И. (2019). Анализ первичных форм туберкулеза у детей, проживающих в Хорезмской области. Наука, техника и образование, (9 (62)), 64-68.
9. Артиков, И. А., Отажанов, Ш. З., & Садуллаев, С. Э. (2025). ПАТОМОРФОЛОГИЧЕСКИЕ АСПЕКТЫ ДЕТСКОГО ЛИМФОБЛАСТНОГО ЛЕЙКОЗА. Multidisciplinary Journal of Science and Technology, 5(6), 257-264.
10. Kadamovna, A. D., Rustombekovich, N. R., Zarifboyevich, O. S., & Ernazarovich, S. S. (2025). COMBINATIONS OF HEPATITIS B WITH

PULMONARY TUBERCULOSIS. Multidisciplinary Journal of Science and Technology, 5(5), 60-65.
11. Rustombekovich, N. R., Zarifboyevich, O. S., Kadamovna, A. D., & Ernazarovich, S. S. (2025). THE STATE OF THE ANTIOXIDANT DEFENSE SYSTEM IN CHRONIC HEPATITIS C. Multidisciplinary Journal of Science and Technology, 5(5), 79-84.
12. Ernazarovich, S. S., Zarifboyevich, O. S., Rustombekovich, N. R., & Kadamovna, A. D. (2025). DYNAMICS OF THE COVID-19 PANDEMIC AND ITS CLINICAL CONSEQUENCES. Multidisciplinary Journal of Science and Technology, 5(5), 85-90.
13. Худайкулова, Г. К., Муминова, М. Т., & Отажанов, Ш. З. (2021). АНАЛИЗ ЭТИОЛОГИЧЕСКОЙ СТРУКТУРЫ ВИРУСНЫХ ДИАРЕЙ У ВИЧ-ИНФИЦИРОВАННЫХ ДЕТЕЙ. Journal of cardiorespiratory research, 2(3), 31-34.
14. Аскарова, Р. И., & Отажанов, Ш. З. (2020). Туберкулез на фоне сопутствующей инфекции. European Science, (3), 52.
15. Ibraximova, H. R., Artiqov, I. A., & Otajanov Sh, Z. (2025). HELMINTH INFECTIONS: CLASSIFICATION, DEVELOPMENTAL CONDITIONS, AND CLINICAL MANIFESTATIONS. Multidisciplinary Journal of Science and Technology, 5(6), 1241-1245.
16. Юсупов, Ш. Р., Отажонов, Ш. З., Артиков, И. А., & Ибодуллаева, С. С. (2025). МИКРОБИОЛОГИЧЕСКАЯ СТРУКТУРА ОСТРЫХ ДИАРЕЙНЫХ ЗАБОЛЕВАНИЙ В ЮЖНОМ ПРИАРАЛЬЕ: РЕЗУЛЬТАТЫ ЭПИДЕМИОЛОГИЧЕСКОГО МОНИТОРИНГА. Multidisciplinary Journal of Science and Technology, 5(6), 237-242.
17. Urinovna, M. O., Kadamovna, A. D., Zarifboyevich, O. S., & Axmedjonovich, A. I. (2025). PUBLIC HEALTH AND EPIDEMIOLOGICAL INSIGHTS INTO THE COVID-19 PANDEMIC. Multidisciplinary Journal of Science and Technology, 5(6), 243-248.
18. ARTIQOV, I., & ABDULLAYEVA, D. (2025). THE SPREAD OF DIARRHEAL DISEASES IN THE KHOREZM REGION. Multidisciplinary Journal of Science and Technology, 5(3), 672-677.
19. Otajanov, S. Z. (2025, January). CYTOKINE LEVELS IN HIV-INFECTED CHILDREN WITH VIRAL DIARRHEA. In CONFERENCE ON THE ROLE AND IMPORTANCE OF SCIENCE IN THE MODERN WORLD (Vol. 2, No. 1, pp. 148-148).
20. Худайкулова Гулнара Каримовна, Муминова Махбуба Тешаевна, & Отажанов Шамсиддин Зарифбаевич (2021). АНАЛИЗ ЭТИОЛОГИЧЕСКОЙ СТРУКТУРЫ ВИРУСНЫХ ДИАРЕЙ У ВИЧ-

ИНФИЦИРОВАННЫХ ДЕТЕЙ. Journal of cardiorespiratory research, 2 (3), 31-34. doi: 10.26739/2181
21. Машарипова, Ш. С., Матякубова, О. У., & Артиков, И. А. (2025). РАЗВИТИЯ ВНУТРИБОЛЬНИЧНОЙ ПНЕВМОНИИ. Научный Импульс, 3(29), 355-359.
22. Ibrakhimova, H. R., & Nurllayev, R. R. (2023). A method for obtaining precipitating serums for the detection of human seminal fluid used in the study of physical Evidence in forensic biological laboratories. World Bulletin of Management and Law, 19, 42-44.
23. Машарипова, Ш. С., Ибрахимова, Х. Р., & Машарипов, С. М. (2023). Анализ эпидемиологических особенности диарейных заболеваний у детей южного приаралья. O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI, 2(15), 884-887.
24. Юсупов, Ш. Р., Аскарова, Р. И., Машарипова, Ш. С., & Якубова, У. Б. (2019). Анализ факторов риска, влияющих на развитие туберкулеза у детей в Хорезмской области. Наука, техника и образование, (8 (61)), 66-72.
25. Sadullayev, S. E. (2024). THE COURSE OF NOSOCOMIAL PNEUMONIA IN PATIENTS ON LONG-TERM ARTIFICIAL LUNG VENTILATION. O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI, 2(26), 80-84.
26. Nurllayev, R. R., and I. A. Artiqov. "IMPROVING THE PRIMARY PREVENTION OF ACUTE DIARRHEAL DISEASES AMONG CHILDREN." Finland International Scientific Journal of Education, Social Science & Humanities 11.4 (2023): 6-10.
27. Masharipov, S., Sadullaev, S. E., & Sh, M. D. (2023). THE COURSE OF CORONAVIRUS AGAINST THE BACKGROUND OF CHRONIC HEPATITIS. Научный импульс, 78.
28. Машарипова, Ш. С., & Матякубова, А. У. (2020). Кумысолечение ослабленных детей в Хорезмском регионе. Наука, образование и культура, (2 (46)), 49-51.
29. Matyakubova, O. U. (2023). EPIDEMIOLOGICAL FEATURES OF CHICKENPOX AMONG CHILDREN IN THE KHAREZM REGION. Finland International Scientific Journal of Education. Social Science & Humanities, 11(4), 11-14.
30. Ибрахимова, Х. Р., Отажанов, Ш. З., & Матякубова, О. У. (2019). ТУБЕРКУЛЕЗНЫЙ МЕНИНГИТ У БОЛЬНЫХ, ПРОЖИВАЮЩИХ В ХОРЕЗМСКОЙ ОБЛАСТИ. In INTERNATIONAL SCIENTIFIC REVIEW OF THE PROBLEMS OF NATURAL SCIENCES AND MEDICINE (pp. 96-104).

31. Юсупов, Ш. Р. (2020). Абдуллаева Дилфуза Кадамовна, Машарипова Шохиста Сабировна, Матякубова Ойша Уриновна Применение пектина в комплексной терапии при острых кишечных инфекциях. Вестник науки и образования,(5-2), 83.
32. Юсупов, Ш. Р., Абдуллаева, Д. К., Машарипова, Ш. С., & Матякубова, О. У. (2020). Применение пектина в комплексной терапии при острых кишечных инфекциях. Вестник науки и образования, (5-2 (83)), 51-56.
33. Машарипова, Ш. С., Артиков, И. А., & Матякубова, О. У. (2021). РАСТРОЙСТВА ПСИХИКИ У БОЛЬНЫХ ДЕСТРУКТИВНЫМИ ФОРМАМИ ТУБЕРКУЛЕЗА В УСЛОВИЯХ ПАНДЕМИИ COVID-19. Journal of cardiorespiratory research, 2(3), 73-77.
34. Masharipov, S. M., Matyakubova, O. U., & Yakubov, K. Y. (2025). IMMUNE STATUS IN PATIENTS WITH PARASITIC DISEASES IN KHOREZM REGION. Multidisciplinary Journal of Science and Technology, 5(1), 514-517.
35. Машарипова, Ш. С. (2022). O ‘PKA ARTERIYALARINING QANDLI DIABET TA’SIRIDA MORFOLOGIK TUZILISHI. Журнал кардиореспираторных исследований, 3(1).
36. Машарипова, Ш. С. (2020). Матякубова Айша Уриновна Кумысолечение ослабленных детей в Хорезмском регионе. Наука, образование и культура, 2, 46.
37. Аскарова, Р. И., Машарипова, Ш. С., Атажанов, Ш. З., Машарипова, Х. К., & Якубова, У. Б. (2019). ОСОБЕННОСТИ ТЕЧЕНИЯ БЕРЕМЕННОСТИ ЖЕНЩИН, БОЛЬНЫХ ТУБЕРКУЛЁЗОМ ОРГАНОВ ДЫХАНИЯ. In International scientific review of the problems of natural sciences and medicine (pp. 202-209).
38. Машарипова, Ш. С. (2022). МОРФОЛОГИЧЕСКОЕ СТРОЕНИЕ ЛЕГОЧНЫХ АРТЕРИЙ ПОД ВЛИЯНИЕМ САХАРНОГО ДИАБЕТА. Journal of cardiorespiratory research, 3(1), 52-54.
39. Машарипова, Ш. С., & Матякубова, О. У. (2020). Течение ВИЧ/СПИД инфекции у больных туберкулезом легких. European science, (3 (52)), 110-112.
40. Юсупов, Ш. Р., Абдуллаева, Д. К., Машарипова, Ш. С., & Матякубова, О. У. (2020). Применение пектина в комплексной терапии при острых кишечных инфекциях. Вестник науки и образования, (5-2 (83)), 51-56.
41. Юсупов, Ш. Р., Ибрагимова, Х. Р., Машарипова, Ш. С., Якубова, У. Б., & Рахимбаев, М. Ш. (2015). Особенности этиологической структуры острых диарейных заболеваний в условиях Южного Приаралья. Вісник проблем біології і медицини, (3 (1)), 246-248.
42. Sh, Y. S., & Ibrakhimova, H. R. (2023). Masharipova Sh.

43. Sh, Y. S., & Ibrakhimova, H. R. (2023). IMMUNOLOGICAL CHARACTERISTICS OF PATIENTS WHOSE BODY IS INFECTED WITH CATTLE SOLITAIRE. Новости образования: исследование в XXI веке, 2(15), 120-124.
44. Raximboyevich, Y. S., Rustamovna, I. H., & Sabirovna, M. S. (2025). ROTAVIRUS INFECTION AMONG CHILDREN: TRANSMISSION, RISKS AND PREVENTIVE MEASURES. Multidisciplinary Journal of Science and Technology, 5(6), 225-230.
45. Машарипова, Ш. С., Матякубова, О. У., Абдуллаева, Д. К., & Ибодуллаева, С. С. (2025). КЛИНИЧЕСКИЕ И ИММУНОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ИНФЕКЦИОННОГО МОНОНУКЛЕОЗА У ДЕТЕЙ. Multidisciplinary Journal of Science and Technology, 5(6), 249-256.