

Scottish International Conference on Multidisciplinary Research and Innovation – SICMRI 2025

LABORATORY DIAGNOSIS OF *HELICOBACTER PYLORI*

Lehours Patello Siriniuos

Medical researcher

Abstract: *Helicobacter pylori* infection is one of the most common chronic bacterial infections worldwide and is strongly associated with gastritis, peptic ulcer disease, and gastric malignancies. Accurate laboratory diagnosis is essential for appropriate treatment, eradication monitoring, and prevention of long-term complications. This article reviews current laboratory diagnostic methods for *H. pylori*, including invasive and non-invasive techniques, highlighting their diagnostic accuracy, clinical applications, advantages, and limitations. An integrated diagnostic approach based on clinical context and test availability remains crucial for optimal patient management.

Keywords: *Helicobacter pylori*, laboratory diagnosis, urease test, serology, stool antigen test, urea breath test

Introduction

Helicobacter pylori is a Gram-negative, spiral-shaped bacterium that colonizes the gastric mucosa and induces chronic inflammation. Since its discovery, *H. pylori* has been recognized as a major etiological factor in chronic gastritis, peptic ulcer disease, mucosa-associated lymphoid tissue lymphoma, and gastric adenocarcinoma. Due to the often asymptomatic nature of infection, laboratory diagnostics plays a central role in identifying infected individuals and guiding therapeutic decisions.

The choice of diagnostic method depends on clinical indication, patient age, availability of laboratory resources, and whether the aim is initial diagnosis or confirmation of eradication. Both invasive methods requiring endoscopy and non-invasive laboratory tests are widely used in clinical practice.

Materials and Methods

This article is based on a comprehensive review of current laboratory diagnostic techniques for *H. pylori* infection. Published clinical studies, international guidelines, and laboratory protocols were analyzed. Diagnostic methods were classified into invasive and non-invasive approaches. The sensitivity, specificity, and clinical applicability of each method were evaluated, with attention to pre-analytical and analytical factors influencing test performance.

Results

Laboratory diagnosis of *H. pylori* includes a range of invasive and non-invasive methods. Invasive techniques require gastric biopsy obtained during endoscopy. Rapid urease testing is commonly used due to its simplicity and rapid results. Histological examination allows direct visualization of the organism and assessment of mucosal pathology. Culture of *H. pylori*, although technically demanding, enables antimicrobial susceptibility testing and is particularly valuable in cases of treatment failure. Molecular methods such as polymerase chain reaction offer high sensitivity and allow detection of antibiotic resistance genes.

Non-invasive diagnostic methods are widely used, especially in primary care and pediatric populations. The urea breath test is considered one of the most accurate non-invasive tests for active infection and eradication confirmation. Stool antigen testing detects *H. pylori* antigens and is useful for both diagnosis and follow-up. Serological tests detect antibodies against *H. pylori*

Scottish International Conference on Multidisciplinary Research and Innovation – SICMRI 2025

but cannot distinguish between active and past infection, limiting their role in eradication assessment.

Discussion

The laboratory diagnosis of *H. pylori* infection requires careful selection of diagnostic tests based on clinical context. Invasive methods provide comprehensive information but are limited by cost and patient discomfort. Non-invasive tests offer high diagnostic accuracy and are preferred for initial screening and post-treatment monitoring.

Pre-analytical factors such as recent antibiotic use, proton pump inhibitor therapy, and gastrointestinal bleeding can affect test results and should be considered when interpreting laboratory findings. The increasing prevalence of antibiotic-resistant *H. pylori* strains highlights the importance of culture and molecular diagnostics in selected cases.

An integrated diagnostic strategy combining clinical assessment and appropriate laboratory testing improves diagnostic accuracy and supports effective eradication therapy.

Conclusion

Laboratory diagnosis is fundamental to the effective management of *Helicobacter pylori* infection. A variety of invasive and non-invasive diagnostic methods are available, each with specific advantages and limitations. Accurate detection of active infection and confirmation of eradication require careful test selection and awareness of factors influencing diagnostic performance. Advances in molecular diagnostics and antimicrobial resistance testing are expected to further enhance the role of laboratory medicine in *H. pylori* management.

Literature:

1. Qodirovich, Q. S. (2025). PHYSIOLOGY OF VISION: PROCESSES OF LIGHT RECEPTION AND VISUAL INFORMATION PROCESSING. *Shokh Articles Library*, 1(1).
2. Qodirovich, Q. S. (2025). INSON ASAB TIZIMINING MOSLASHUVCHANLIGI VA NEYROPLASTIKLIK MEXANIZMLARI. *Shokh Articles Library*, 1(1).
3. Baxtiyorovna, A. S., Baxtiyorovna, K. I., Baxromovich, R. J., Anvarjanovna, M. M., Qodirovich, Q. S., Djiganshayevna, B. G., ... & Qizi, Y. D. J. (2025). The Role of Neurophysiological and Neurovisualization Testing Methods in the Diagnosis of Motor Neuron Disease. *Revista Latinoamericana de la Papa*, 29(1), 196-201.
4. Кадиров, Ш. К. (2025, May). ЗНАЧЕНИЕ МЕТРОЛОГИЧЕСКОЙ ПРОСЛЕЖИВАЕМОСТИ. In *International Conference on Educational Discoveries and Humanities* (pp. 133-136).
5. Хажиев, Н. М., & Кадиров, Ш. К. (2025). КЛЮЧЕВАЯ РОЛЬ МЕТРОЛОГИИ В ПРОЦЕССАХ И УЛУЧШЕНИЯХ КАЧЕСТВА ПРОИЗВОДСТВА. *Pedagogs*, 81(1), 204-214.
6. Kodirov, S. (2025). SECRETION OF ENZYMES BY SALIVARY GLANDS AND ENZYME HOMEOSTASIS UNDER THE SEPARATE AND COMBINED INFLUENCE OF HIGH TEMPERATURE AND INSOLATION. *Journal of Multidisciplinary Sciences and Innovations*, 1(1), 90-95.
7. Sh, Q. R. (2025). BIOLOGIK KIMYO DARSLARIDA MUAMMOLI O 'QUV TEXNOLOGIYALARI. *Экономика и социум*, (9-2 (136)), 173-176.
8. Мирзарахимова, М., & Кадиров, Ш. (2024). GIPOKINEZYA TA'SIR ETGAN MUHIM KOMONENT sifatida SHARTLARDA ME'DA BEZINING ENZIM GOMEOSTAZISI YUQORI HARORAT VA INSOLASYON. *Universal xalqaro ilmiy jurnal*, 1(4), 425-426.

**Scottish International Conference on Multidisciplinary Research and
Innovation – SICMRI 2025**

8. Sh, Q. R. (2024). OQSILLAR SINTEZI VA SHAKLLANISHI. *Экономика и социум*, (2-1 (117)), 580-584.
9. Sh, Q. R. (2023). QON BIOKIMYOSI. QONNING KLINIK TAXLILI. *Экономика и социум*, (12 (115)-1), 592-595.
10. Sh, Q. R. (2023). SIYDIK BIOKIMYOSI MAVZUSINI O'QITISHDA LABORATORIYA DARSLARINING O'RNI. *Экономика и социум*, (9 (112)), 245-248.
11. Sh, Q. R. (2022). CHARACTERISTICS, DISEASES AND DIAGNOSIS OF IRON METABOLISM-HEMOSIDERIN. *Экономика и социум*, (5-2 (92)), 240-242.