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MANAGEMENT OF PATIENTS WITH *HELICOBACTER PYLORI* INFECTION IN WAR CONDITIONS IN UKRAINE

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Abstract – The ongoing war in Ukraine is causing severe consequences in the form of numerous casualties among military and civilians, the migration of millions of residents, and the destruction of infrastructure, including the destruction of health care facilities. Oncological morbidity and mortality, including those caused by gastric neoplasms, are the main challenges for the public health system of Ukraine.
This article reports the current methods used for the diagnosis and treatment of *H. pylori*. National experts in gastroenterology are advocating for the introduction of a search-and-treat screening program, planning epidemiological studies, and implementing measures to improve the availability of optimal methods for diagnosing *H. pylori* infection and effective means of its eradication.

Keywords: *H. pylori*, Stomach cancer, Eradication, Test-and-treat, Antibiotic resistance.

INTRODUCTION

Consequences of the War in Ukraine

Military conflicts are one of the most significant, if not the most challenging, conditions for countries, regions, and, in general, for global civilization. Together with natural disasters and pandemics, they cause the loss of human life in the military and civilians, a decrease in physical and mental health, and depletion of material resources.

The war in Ukraine began in February 2014 with the occupation of Crimea by Russia in violation of the basic norms of international law and the UN Charter. On 24/02/2022, the aggressor's armed invasion took on a large-scale character with the occupation of more than 18% of the sovereign territory of our country.

Over the past year, 62,185 airstrikes have been conducted, and 16,205 reports of explosions have been received. Currently, the whole territory of Ukraine is under ongoing attack by drones with explosives and ballistic missiles, and the number and duration of shelling are constantly increasing[1].

As of 08/04/2025, according to the UN, about 13,000 Ukrainian civilians have been killed, including 692 children, and 30,500 civilians have been injured[2]. According to unofficial data, at least 500 medical workers have been killed since the beginning of the war. Also, from the report of the Committee on National Health, Medical Care and Medical Insurance of the Ukrainian Parliament, during the three years of full-scale war, the Russians have damaged and destroyed 2,285 healthcare facilities (1,984 damaged, 301 destroyed)[3].

The migration of the Ukrainian population after the full-scale Russian invasion became a record since the Second World War, reaching 7.5 million people in the fall of 2022[4]. A significant number of women and children remain in European countries. Tens of thousands of Ukrainian families were forced to move further from the front line to other regions of Ukraine. Among the Ukrainians who were forced to leave their cities and villages, many are doctors, nurses, and other healthcare professionals. However, our survey on Facebook showed that 85% of gastroenterologists continue to live and work in their cities. At the same time, in 2014, well-developed gastroenterology clinics were lost in Donetsk and Crimea.

Public Health Challenges in Ukraine, Morbidity, and Mortality from Stomach Cancer

Despite the tragic impact of the consequences of the aggressor's incessant military attacks, the main public health problem in Ukraine remains morbidity and mortality from non-communicable diseases. Cardiovascular diseases and cancer are the leading causes of death, including among young people of working age, especially men.

Malignant neoplasms of the digestive system are the most common among the population of Ukraine; their prevalence in 2022 reached almost 25,900 cases and accounted for 24.4% of all detected cancer diseases, and the number of registered deaths of patients in this category reached 14,300 cases (34.0% of all deaths from oncological pathology)[5].

The total number of new stomach cancer cases was 5,401 (3,329 males and 2,072 females) in 2022. During this year, 3,396 patients died from gastric neoplasms, 48% of whom did not survive one year from the moment of diagnosis. Gastric cancer, most of which is associated with chronic *Helicobacter pylori* infection[6], ranks third, accounting for 9% of cancer mortality, in men and fourth in women (6.7%)[7].

Screening and Diagnosis of *Helicobacter pylori* (*H. pylori*) Infection

In 2024, Ukraine enforced the National Strategy for the Control of Malignant Neoplasms for the period until 2030. The Action Plan was agreed on for its implementation until the end of 2025 at the same time. Unfortunately, neither the strategy nor the action plan included a gastric cancer screening program, following the example of the screen-and-treat strategy introduced in some countries, including several European countries that have launched pilot gastric cancer prevention projects[8].

Given the predicted significant negative public health consequences in the absence of systematic gastric cancer prevention – particularly the potential risk of *H. pylori*-associated neoplasms in the 50,000–75,000 Ukrainians born between 2008 and 2017 – the Ukrainian Gastroenterological Association will continue its efforts to include the screen-and-treat program in the measures of the National Cancer Prevention Strategy.

Additional arguments for planning and implementing systematic measures for screening and eradication of *H. pylori* are the decisive therapeutic impact on other important clinical conditions, including peptic ulcers, NSAID-associated gastropathies, dyspepsia, iron deficiency anemia, and idiopathic thrombocytopenic purpura[10].

Despite the ongoing martial law in Ukraine, the availability of diagnostic tests for the reliable detection of active *H. pylori* infection has not worsened but has shown a tendency to improve.

The possibility of conducting a ^{13}C-Urea breath test has been partially restored in Kyiv. Currently, about 150 tests are performed per month, with the potential to significantly increase that number, given the substantial population growth in the capital of Ukraine since 2022 due to internal migration.

In early 2024, a number of commercial laboratories began conducting multiplex real-time PCR for the diagnosis of *H. pylori* in stool samples and gastric biopsies, with the additional possibility of detecting A2143G, A2142G, and A2142C mutations in the 23S rRNA gene, which are responsible for bacterial resistance to clarithromycin.

From February 2024 to May 2025, 19,524 PCR studies of stool samples were performed in one of the largest commercial laboratory networks. 15.9% positive results were recorded.

When comparing the percentage of positive results from this type of *H. pylori* diagnostic test with the percentage of positive results from 942 breath tests using ^{13}C-urea (31.4%), the discrepancy confirms the potential sensitivity limitations of PCR detection of the bacteria in stool samples and the dependence of this indicator on the quality of the extraction methodology. Given that PCR studies of stool samples and breath tests are prescribed for the diagnosis of *H. pylori* in patients with dyspeptic complaints, it is possible to predict the prevalence of infection in this category at a level close to 30%. At the same time, larger-scale studies are needed to clarify the prevalence of infection among subjects with or without specific complaints.

Over the same period (from February 2024 to May 2025), only 1,149 stool samples underwent clarithromycin resistance testing (of the total 19,524 PCR tests due to additional costs for antibiotic resistance testing), and corresponding mutations were detected in 17% of cases.

A significant challenge in implementing such highly informative methods for diagnosing *H. pylori* infection is the extremely limited number of PCR studies performed on gastric mucosal biopsies. It is planned to conduct systematic work with specialists to expand the scope and performance of such studies.

In addition to breath tests and PCR diagnostics, commercial and state/municipal healthcare institutions widely use rapid urease tests, serological tests, and fecal antigen rapid tests. Monitoring the effectiveness of eradication therapy is carried out mainly using fecal rapid tests and, to a limited extent, with the use of the ^{13}C-Urea breath test.

Therapy for the Eradication of *H. pylori* Infection

The Clinical Guidelines and Unified Protocol “Peptic ulcer of the stomach and duodenum in adults and children,” approved by the Ministry of Health of Ukraine in August 2023, implements the recommendations of the VI Maastricht Consensus[11] regarding the appointment of 1st, 2nd line therapy, as well as rescue therapy.

At the same time, the practical application of the recommendations was and is influenced by certain objective factors, including:

– The lack of results of a national study of the prevalence of *H. pylori* resistance to clarithromycin.
– Restrictions on the use of levofloxacin.
– The absence of tetracycline in a dosage of more than 100 mg per pill by 2024.

The uncertainty of the situation with resistance to clarithromycin leads to a risky tactic of its appointment as part of empirical first-line therapy. Another systemic problem remains the unjustified widespread use of seven- and ten-day courses of eradication therapy.

Many specialists, in most cases, prescribe bismuth subcitrate in addition to various eradication regimens. This approach has a positive effect on the level of eradication of the infection, but at the same time complicates the treatment program and may worsen compliance. The potential for increasing the effectiveness of treatment using high doses of PPIs, which is almost not implemented by Ukrainian gastroenterologists, also remains insufficiently realized. Moreover, higher doses of amoxicillin (3 to 4 g/day, taken in 3 to 4 doses) are not prescribed by specialists following recent antimicrobial stewardship guidelines[12].

In the first half of 2024, tetracycline hydrochloride was finally registered in Ukraine in capsules with a dosage of 500 mg. This opened the possibility of widespread use of classical quadruple therapy with PPIs, bismuth, tetracycline, and metronidazole. In the first pilot study (n=30 pts), the use of this regimen demonstrated 100% effectiveness (unpublished data).

More gastroenterologists in Ukraine are using probiotics as adjuvant therapy with eradication regimens to improve tolerability and reduce the development of antibiotic resistance in the gut microbiota[13,14].

Reimbursement Issues in the Diagnosis and Treatment of Patients Infected with *H. pylori*

Since 2020, Ukraine has launched a State Medical Guarantees Program, with its volume approved annually by the Government. The National Health Service of Ukraine manages the funds, signing agreements with healthcare providers and reimbursing expenses for preventive, diag-

nostic, and treatment services under medical service packages. As part of the medical guarantee program, upon referral from a family doctor, gastroenterologist, or other specialist, upper endoscopy with biopsy and morphological examination is performed according to indications. At the same time, the program covers only the fecal antigen test for detecting *H. pylori* infection. Other tests are carried out at the patients' expense.

Another State Program, "Affordable Medicines," has been launched to reimburse the cost of a certain list of medicines prescribed to patients. Currently, drugs for the eradication of *H. pylori* are not included in the list approved by the Ministry of Health and the National Health Service of Ukraine.

Patients pay for the cost of drugs in 100% of cases. The approximate cost of classic triple therapy (esomeprazole 40 mg b.i.d., clarithromycin 500 mg b.i.d., amoxicillin 1000 mg b.i.d.) for 14 days is approximately 35 Euros. The cost of quadruple therapy with bismuth (esomeprazole 40 mg b.i.d., tetracycline 500 mg q.i.d., metronidazole 500 mg t.i.d., bismuth subcitrate 120 mg q.i.d.) for 14 days is approximately 40 Euros.

CONCLUSIONS

Russia's full-scale war against Ukraine is causing severe consequences, including mass civilian casualties, the displacement of millions of people, and damage and destruction of civilian and medical infrastructure.

Key public health problems in Ukraine are exacerbated during martial law and require the immediate introduction of effective systemic countermeasures.

The *H. pylori* screening and treatment program can prevent tens of thousands of cases of stomach cancer, curing peptic ulcers, NSAID gastropathies, some cases of functional dyspepsia, iron deficiency anemia, and idiopathic thrombocytopenic purpura.

Approaches to the diagnosis and treatment of patients need to be optimized based on the results of national studies on the prevalence of *H. pylori* resistance to clarithromycin and adherence to the recommendations of the Maastricht Consensus VI.

It is necessary to include a broader list of informative diagnostic tests in the Medical Guarantees Program and to add *H. pylori* eradication therapy drugs to the "Affordable Medicines" Program, the cost of which is reimbursed by the National Health Service of Ukraine.

Authors' Contributions

Drafting of the manuscript: Igor Skrypnyk, Oleg Shvets. Critical revision of the manuscript for important intellectual content: Igor Skrypnyk, Oleg Shvets.

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Conflicts of Interest

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REFERENCES

1. Air-alarms.in.ua. Available at: https://air-alarms.in.ua/en
2. United Nations Human Rights. Three years since the full-scale invasion of Ukraine: Key facts and findings about the impact on human rights 24 February 2022 to February 2025. Available at: https://ukraine.ohchr.org/en

3. Supreme Council of Ukraine. Available at: https://www.rada.gov.ua/news/news_kom/258965.html
4. Beaumont P. "Ukraine has fastest-growing refugee crisis since second world war, says UN". The Guardian. Archived from the original on 9 March 2022. Available at: https://www.theguardian.com/world/2022/mar/06/ukraine-fastest-growing-refugee-crisis-since-second-world-war
5. Michailovich YI, Sumkina OV, Gorokh YL. CANCER INCIDENCE IN UKRAINE: TRENDS IN 2010-2019 AND THE IMPACT OF COVID-19 PANDEMIC. Exp Oncol 2024; 45: 463-473.
6. de Martel C, Georges D, Bray F, Ferlay J, Clifford GM. Global burden of cancer attributable to infections in 2018: a worldwide incidence analysis. Lancet Glob Health 2020; 8: e180-e190.
7. The Cancer in Ukraine, 2022-2023. Incidence, mortality, indicators of oncology service activity. Available at: http://www.ncru.inf.ua/publications/BULL_25/PDF/oglyad_25.pdf
8. Europe's Beating Cancer Plan—Communication from the Commission to the European Parliament and the Council (European Commission, 2021). Available at: health.ec.europa.eu/system/files/2022-02/eu_cancer-plan_en_0.pdf
9. Park JY, Georges D, Alberts CJ, Bray F, Clifford G, Baussano I. Global lifetime estimates of expected and preventable gastric cancers across 185 countries. Nat Med 2025; 31: 3020-3027.
10. IARC (World Health Organization). *Helicobacter pylori* Eradication as a Strategy for Preventing Gastric Cancer (IARC Working Group Report No. 8), 2014. Available at: https://publications.iarc.who.int/Book-And-Report-Series/Iarc-Working-Group-Reports/-Em-Helicobacter-Pylori-Em-Eradication-As-A-Strategy-For-Preventing-Gastric-Cancer-2014
11. Malfertheiner P, Megraud F, Rokkas T, Gisbert JP, Liou JM, Schulz C, Gasbarrini A, Hunt RH, Leja M, O'Morain C, Rugge M, Suerbaum S, Tilg H, Sugano K, El-Omar EM; European Helicobacter and Microbiota Study group. Management of *Helicobacter pylori* infection: the Maastricht VI/Florence consensus report. Gut 2022: gutjnl-2022-327745. Epub ahead of print.
12. Fadieienko F, Shvets O, Moreira L, Nyssen OP. Current trends in the treatment of *H. pylori* infection in Ukraine: results of the European Registry on *H. pylori* Management (Hp EuReg). Modern Gastroenterology 2022; 3-4: 125-126.
13. Cifuentes SG, Prado MB, Fornasini M, Cohen H, Baldeón ME, Cárdenas PA. Saccharomyces boulardii CNCM I-745 supplementation modifies the fecal resistome during *Helicobacter pylori* eradication therapy. Helicobacter 2022; 27: e12870.
14. Malfertheiner P, Schulz C, Hunt RH. *Helicobacter pylori* Infection: A 40-Year Journey through Shifting the Paradigm to Transforming the Management. Dig Dis 2024; 42: 299-308.