

EXAMINATION OF HISTOPATHOLOGICAL STAGES OF THE MUCOSAL ATROPHY
IN EARLY DIAGNOSIS OF GASTRIC CANCERIsmailova J. A.¹, Yusupbekov A. A.² and Tuychiyev O. D.^{2*}¹Republican Specialized Scientific and Practical Center for Therapy and Medical Rehabilitation.²Republican Specialized Scientific and Practical Center for Oncology and Radiology, Uzbekistan.

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ABSTRACT

The authors studied the morphological changes in the gastric mucosa in 232 patients with H. pylori-associated gastric diseases. The results of the study showed that the intensity of morphological changes in the stomach depend on the nosological forms of H. pylori-associated diseases of the stomach. The general interpretation of the obtained results indicates the feasibility of using the OLGA and OLGIM system, and can serve as the most reasonable platform for building the next strategy of therapeutic measures.

KEYWORDS: H. pylori-associated diseases of the stomach, morphological studies, H. pylori bacterium, OLGA and OLGIM systems.

INTRODUCTION

To date, Gastric Cancer (GC) is considered one of the most attention-requiring problems of modern oncology, which takes fourth place in incidence rate and is the second most fatality cancer worldwide by GLOBOCAN 2020. In Russia, GC is third most common (8%) cancer after lung and breast cancer, by mortality rate, GC concedes only lung cancer (12,2%).^[2,6] In 2021, 25 578 new cases of oncological pathology were diagnosed (in 2020 – 21976 cases), males 10 499 (41,0%) and females 15079 (59,0%). In Republic of Uzbekistan incidence rate of malignant tumors in 2021, which was 74,0 cases for 100 000 population, has shown growth for 16,4% than in 2020. Among men, incidence rate of GC was the most high, indicating 7,0 cases for 100 000 population, where in women, it was inferior only than breast cancer, 5,6 cases for 100 000 population.^[2]

In Uzbekistan, treatment of GC, regardless of etiopathogenetic factors, is based on standard treatment principles of oncological diseases, and 5-year overall survival rate (5-OS) does not exceed 50% even in early stages. Aggressive nature and moderate sensibility to chemo-radiotherapy demands genetic studies of the cancer and individual approach to the therapy of GC.^[6]

According to World Health Organization (WHO) and Maastricht consensus (MC) *Helicobacter Pylori* is considered one of the main factors in development of gastrointestinal diseases and GC.^[1,3,5,9] Chronic gastritis is always ranked as a cornerstone of cascade which leads

to GC. Nowadays, H.Pylori is considered main etiological factor of chronic gastritis and duodenitis. Epidemiological researches have shown that, chronic atrophic gastritis, with H.pylori positive cases, have increased risk of gastric adenocarcinoma.^[1,3,10] Morphological examination of mucosal specimen from population, who lives in endemic regions of GC, allows creating criteria of precancerous pathologies. Japanese scientists offer differentiate precancerous and precancer pathologies.^[7] First group includes pathologies which may develop to cancer (metaplasia, gastric ulcer, gastric polyps and atrophic gastritis), second group includes dysplastic changes, which directly lead to cancer.^[3,8] During gastroscopy, in order to adequate assessment of precancerous changes of gastric mucosa, it is estimated that samples must be taken from 4 areas: proximal and distal parts of major and minor curvatures. Histopathological classifications as OLGA and OLGIM (operative link on gastritis assessment and operative link on gastric intestinal metaplasia assessment), help divide patients into different risk groups of GC.^[2,4,10]

Aim of the research is to study histological changes of the gastric mucosa in H.pylori-associated gastric diseases.

Object of the study

232 patients with H.pylori-associated gastric diseases, who underwent clinical, instrumental and morphological examinations with subsequent analyses.

Methods

Peculiarities of mucosal alterations in *H.pylori*-associated gastric diseases were investigated. Patients were divided into five research groups according to nosology of *H.pylori*-associated disease. Comparative analysis of the results of research groups (84 patients with chronic non-atrophic gastritis (CNAG), 49 patients with chronic atrophic gastritis (CAG), 31 patients with gastric ulcer (GU), 42 patients with MALT-lymphomas and 26 patients with GC) was conducted. Gender difference was not significant among studied patients, which demonstrates that both sexes are equally vulnerable to the infection: 128 males (55,3%) and 104

females (44,7%). Age of patients was between 19 and 73, mean $46,7 \pm 0,5$ years.

To all patients, gastroscopy and biopsy from five points were carried out. Endoscopically two main types of chronic gastritis were differentiated: catarrhal (superficial) and atrophic. Morphological examination of specimen from five points of gastric mucosa in patients with *H.pylori*-associated diseases was performed, for it allowed to determine precancerous pathologies, such as: fibrosis, atrophy, intestinal metaplasia (IM) and dysplasia (table 1).

Table 1: Morphological structure of gastric mucosa in *H.pylori*-associated diseases. (specimen from five points of mucosal layer were tested), n=232

Nosology	Histological structure							
	Foveolar hyperplasia		Fibrosis		Atrophy		Intestinal metaplasia	
	abs	%	abs	%	abs	%	abs	%
CNAG, n=84	25	29,7	32	38,1	1	1,2	8	9,5%
CAG, n=49	19	38,8	28	57,1	44	89,8	16	32,6
GU, n=31	17	54,8	23	74,2	21	67,7	24	77,4
MAJIT-lym. n=42	29	69,0	15	35,7	13	30,9	36	85,7
GC, n= 26	11	42,3	13	50,0	16	61,5	21	80,7
Total, n=232	101	43,5	110	47,4	95	40,9	105	45,2

The table demonstrates, the gradation of morphological structure of the mucosal layer is variable among different nosology of *H.pylori*-associated gastric diseases. Generally, pathologies of this group morphologically appear as mild atrophy – 40,9%, fibrosis – 47,3% and IM of different grades – 45,2% of the gastric mucosa.

It can be stated from analyze of the data, obtained from researches, low *H.Pylori* contamination of mucosa in

chronic gastritis is associated with the feeble intensity of inflammatory alterations ($p < 0,001$). We have used OLGA and OLGIM assessment systems, which were offered in 2008 by gastroenterologists and pathologists, in order to adequate gradation of gastric mucosal changes. Only one patient had OLGA I grade changes in CNAG group, in CAG group, patients with OLGA grade 0 were 28,6%, I grade – 40,8%, II grade – 14,3%, III grade – 6,1% (table 2).

Table 2: Distribution of patients by OLGA atrophy and IM grades, n=232.

Nosology	OLGA, grade							
	0		I		II		III	
	abs	%	abs	%	abs	%	abs	%
CNAG, n=84	-		1	1,2	-		-	
CAG, n=49	14	28,6	20	40,8	7	14,3	3	6,1
GU, n=31	3	9,7	8	25,8	5	16,1	5	16,1
MAJIT-lym. n=42	1	2,4	2	4,8	6	14,2	4	9,5
GC, n= 26	1	3,8	3	11,5	7	26,9	5	19,2
Total, n=232	19	27,2	35	15,1	24	10,3	17	7,3

Morphological study of patients in CAG group revealed I, II and III grade OLGIM changes, 6,1%, 10,2% and 16,3% respectively. Grade IV, which considered as precancerous condition, was not found. GU was characterized with moderate morphological changes as the transitional form between CAG and GC. In GU, all

morphological changes, based on IM, are assessed by OLGIM system. Thus, I grade – 22,6%, II grade – 29%, III grade – 16,1% and IV grade 9,7% of patients, where IV grade has morphologically irreversible atypical changes in mucosal cells (table 3).

Table 3: Distribution of patients by OLGIM atrophy and IM grades, n=232.

Nosology	OLGIM, grade							
	I		II		III		IV	
	abs	%	abs	%	abs	%	abs	%
CNAG, n=84	8	9,5	-		-		-	
CAG, n=49	3	6,1	5	10,2	8	16,3	-	
GU, n=31	7	22,6	9	29,0	5	16,1	3	9,7
MAJIT-lym. n=42	23	5,4	7	16,7	4	9,5	2	4,8
GC, n= 26		-	4	15,4	9	34,6	8	830,7
Total, n=232	41	17,6	25	10,8	26	11,2	13	5,6

Quantitative and qualitative analyze of morphological specimen test show, that *H.pylori* associated diseases are characterized by variable alterations in gastric mucosa. Among whole clinic groups, morphological changes by OLGA assessment system were grade 0 or I grade, 27,2% and 15,1% respectively. IM by OLGA system documented only in 7,3% patients. Nevertheless, specimen morphological assessment by OLGIM system demonstrated another result. IM of I and II grade observed in 17,6% and 10,8% cases respectively. Irreversible changes of III and IV grade IM also were found in 11,2% and 5,6% of patients accordingly.

Analyze of morphological examination results by OLGA and OLGIM systems demonstrates CNAG group patients had I grade changes in 1,2% and 9,5% cases respectively. In contrast, CAG group patients had 0 grade – 28,6%, I grade – 40,8%, II grade – 14,3% and III grade – 6,1% cases by OLGA system. Assessment by OLGIM system of CAG group reveals morphological changes of I, II and III grades, in 6,1%, 10,2% and 16,3% cases, accordingly. No patients in CAG group diagnosed with grade IV by OLGIM.

Morphological study of patients in CAG group revealed I, II and III grade OLGIM changes, 6,1%, 10,2% and 16,3% respectively. Grade IV, which considered as precancerous condition, was not found. GU was characterized with moderate morphological changes as the transitional form between CAG and GC. In GU, all morphological changes, based on IM, are assessed by OLGIM system. Thus, I grade – 22,6%, II grade – 29%, III grade – 16,1% and IV grade 9,7% of patients, where IV grade has morphologically irreversible atypical changes in mucosal cells (table 3). Presence of severe atrophy and IM in patients with GU warns about GC development.

CAG and GU manifested with different grades of inflammatory process in gastric mucosa. According to the analysis of given results, assessment systems mentioned above are proved to be highly informative, as they allow to assess atrophy and IM in appropriate grades, which makes them main platform to create treatment strategy of patients with *H.pylori* associated gastric diseases. Hence, 17,6% of patients with II and III grades by OLGA and 17,7% of patients with III and IV grades by OLGIM systems are may be at predictable risk of developing neoplastic diseases. This risk in our

observations was not noticed in CNAG group, in CAG group noticed very few and GU demonstrated explicit risk factors of neoplastic pathologies.

We are giving following conclusions on basis of our research results

1. The intensity of morphological changes is always related to nosological forms of *H.pylori* associated gastric diseases.
2. OLGA and OLGIM assessment systems are proved to be highly informative, as they allow to assess atrophy and IM in appropriate grades, which makes them main platform to create treatment strategy of patients with *H.pylori* associated gastric diseases.

REFERENCE

1. Бордин Д.С., Ливзан М. //Консенсус Маастрихт VI опубликован: что нового? Эффективная фармакотерапия, 2022; 18(22): 72–84.
2. [Bordin D.C., Livzan M.// Maastricht VI Consensus published: what is new? Effective pharmacotherapy, 2022; 18 (22): 72-84.
3. Исмаилова Ж.А., Юсупбеков А.А. // Морфологические изменения слизистой оболочки при *Helicobacter pylori*-ассоциированных заболеваниях желудка. Терапевтический вестник Узбекистана, 2022; 4: 127-132.
4. [Ismailova Dj.A., Yusupbekov A.A. // Morphological changes of gastric mucosa in *H.pylori* associated gastric diseases. Therapeutic heralds of Uzbekistan, 2022; 4: 127-132.
5. Цуканов В.В., Третьякова О.В., Амелчугова О.С. и др. Распространенность атрофического гастрита тела желудка у населения г. Красноярск старше 45 лет // Российский журнал гастроэнтерологии, гепатологии, колопроктологии, 2012; 22,4: 27-31.
6. [Cukanov B.B., Tretyakova O.B., Amelchugova O.S. et al. Prevalence of atrophic gastritis of the gastric body in the population of Krasnoyarsk over 45 years old // Russian Journal of Gastroenterology, Hepatology, Coloproctology, 2012; 22,4: 27-31.
7. Fallone, C. A., Chiba, N., van Zanten, S. V., Fischbach, L., Gisbert, J. P., Hunt, R. H., et al. The Toronto consensus for the treatment of *Helicobacter pylori* infection in adults. Gastroenterology, 2016; 151: 51-69. e14. doi: 10.1053/j.gastro.2016.04.006.

8. Graham D.Y. *Helicobacter pylori* update: gastric cancer, reliable therapy, and possible benefits //Gastroenterology, 2015; 148, 4: 719–731.
9. Ismailova J.A., Yusupbekov A.A. CagA gene study - a new therapeutic way for eradication in patients with *Helicobacter pylori* associated gastric diseases// Latin American Journal of Pharmacy (formerly Acta Farmacéutica Bonaerense) Lat. Am. J. Pharm, 2023; 42(3). ISSN 0326-2383. P.43-8
10. Sugano K., Tack J., Kuipers E.J. et al. Kyoto global consensus report on *Helicobacter pylori* gastritis // Gut, 2015; 64,9: 1353–1367.
11. Wald N. J. The treatment of *Helicobacter pylori* infection of the stomach in relation to the possible prevention of gastric cancer. In: IARC *Helicobacter pylori* Working Group. *Helicobacter pylori* Eradication as a Strategy for Preventing Gastric Cancer. Lyon, France: International Agency for Research on Cancer (IARC Working Group Reports, 2014; 81: 174–180.
12. Rawla P., Barsouk A. Epidemiology of gastric cancer: global trends, risk factors and prevention // Prz. Gastroenterol, 2019; 14,1: 26–38.
13. Roberts, S. E., Morrison-Rees, S., Samuel, D. G., Thorne, K., Akbari, A., and Williams, J. G. Review article: the prevalence of *Helicobacter pylori* and the incidence of gastric cancer across Europe. *Aliment. Pharmacol. Ther*, 2016; 43: 334–345. doi: 10.1111/apt.13474.