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Article

Morphofunctional Changes of the Gastric Mucosa in Diffuse Liver Diseases

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Abstract: This article investigates the morphofunctional changes of the gastric mucosa in patients with diffuse liver diseases. During the study, the prevalence of Helicobacter pylori infection, atrophic gastritis, and functional disorders of the gastric mucosa was analyzed in patients with steatosis, hepatitis, and liver cirrhosis. The condition of the gastric mucosa was evaluated using Gastropanel testing and endoscopic examination methods. According to the study results, Helicobacter pylori infection was identified in 89.0% of patients. HP-associated gastritis was more commonly observed in men, whereas corpus and antral atrophy predominated among women. In addition, patients with liver cirrhosis demonstrated more pronounced morphofunctional changes of the gastric mucosa. The findings indicate that comprehensive evaluation of the gastric mucosa in patients with diffuse liver diseases is of great clinical importance for the early detection of high-risk atrophic processes and the timely implementation of preventive measures.

Keywords: diffuse liver diseases, gastric mucosa, Helicobacter pylori, atrophic gastritis, Gastropanel, liver cirrhosis, steatosis, hepatitis, morphofunctional changes, endoscopy, gastric carcinogenesis.

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1. Introduction

Gastric cancer remains one of the most significant oncological problems in Uzbekistan. According to GLOBOCAN 2022 data, gastric cancer ranks second among all malignancies in the general population and first among men in the country. In 2022, a total of 3,053 new cases of gastric cancer were registered in Uzbekistan, accounting for 8.5% of all oncological diseases[1].

Gastric carcinogenesis is a multistep process that usually develops through chronic gastritis, atrophic gastritis, intestinal metaplasia, dysplasia, and invasive carcinoma. In patients with diffuse liver diseases, various morphofunctional disorders of the digestive system are frequently observed. This highlights the importance of comprehensive assessment of the gastric mucosa, Helicobacter pylori infection, and atrophic changes in this patient population[2].

Therefore, the present study aimed to investigate the morphofunctional state of the gastric mucosa in patients with chronic diffuse liver diseases. Such an approach may facilitate the early detection of precancerous gastric lesions, assessment of cancer risk, and timely implementation of preventive measures[3].

Aim of the Study. To evaluate the morphofunctional condition of the gastric mucosa in patients with steatosis, hepatitis, and liver cirrhosis.

2. Materials and Methods

The study was conducted in the gastroenterology and hepatology departments of the Andijan Multidisciplinary Central Hospital. A total of 56 inpatients diagnosed with diffuse liver diseases, including steatosis, hepatitis, and liver cirrhosis, were enrolled in the study. Among them, 32 patients were female (57.1%) and 24 were male (42.9%)[4].

In addition to routine clinical and laboratory examinations, all patients underwent esophagogastroduodenoscopy and Gastropanel testing to assess the morphofunctional state of the gastric mucosa.

Esophagogastroduodenoscopy was performed by certified endoscopists using Olympus gastroscopes. Endoscopic atrophy was evaluated according to the Kimura–Takemoto classification [5].

Gastropanel testing was performed in venous blood serum using the Biohit Healthcare Gastropanel test system by enzyme-linked immunosorbent assay (ELISA. Serum levels of pepsinogen I, pepsinogen II, gastrin-17, and IgG antibodies against Helicobacter pylori were determined. The results were analyzed using an automated ELISA analyzer[6].

3. Results and Discussion

A total of 56 patients were included in the study, of whom 24 were male (42.9%) and 32 were female (57.1%). Helicobacter pylori infection was detected in 50 patients (89.0%). Among HP-positive patients, females accounted for 60.0%, whereas males accounted for 40.0%[7].

Table 1. Distribution of Gastric Atrophy and Helicobacter pylori Infection Among Patients[8].

Sex	HP-positive patients		HP associated gastritis		Corpus atrophy		Antral atrophy		Normal findings		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Male	20	40.0	17	63.0	2	14.3	0	0.0	5	83.3	24	42.9
Female	30	60.0	10	37.0	12	85.7	9	100	1	16.7	32	57.1
Total	50	89.0	27	48.2	14	25.0	9	16.1	6	10.7	56	100

Note: Data are presented as n (%). Percentages for HP-positive patients indicate the distribution according to sex among HP-positive individuals. Percentages for Gastropanel findings represent the proportion within each morphofunctional category. The difference in the distribution of Gastropanel findings between sexes was statistically significant (χ^2=19.889; df=3; p<0.001).

According to Gastropanel results, HP-associated gastritis was detected in 27 patients (48.2%). This condition was more common in men: 17 patients (63.0%). Among women, the corresponding figure was 10 patients (37.0%)[8].

Corpus atrophy was identified in 14 patients (25.0%), with the majority observed among women: 12 patients (85.7%). In men, corpus atrophy was detected in 2 patients (14.3%)[9].

Antral atrophy was observed in 9 patients (16.1%), and all cases were identified among women (100.0%). No cases of antral atrophy were detected in men[10].

Normal Gastropanel findings were observed in 6 patients (10.7%), including 5 men (83.3%) and 1 woman (16.7%)[11].

To evaluate the morphofunctional state of the gastric mucosa in different diffuse liver diseases, including steatosis, hepatitis, and cirrhosis, a study involving 56 patients was performed[12].

Table 2. Morphofunctional Changes of the Gastric Mucosa in Various Diffuse Liver Diseases

Gastropanel findings	Steatosis		Hepatitis		Cirrhosis		Total	
	N	%	N	%	N	%	N	%
Corpus atrophy	7	31.8	0	0.0	7	30.4	14	25.0
Antral atrophy	2	9.1	0	0.0	7	30.4	9	16.1
HP-associated gastritis	7	31.8	11	100.0	9	39.1	27	48.2
Normal findings	6	27.3	0	0.0	0	0.0	6	10.7
Total	22	39.3	11	19.6	23	41.1	56	100

Note: Data are presented as n (%). Percentages indicate the proportion of Gastropanel findings within each disease group. Differences in the distribution of Gastropanel findings among the groups were statistically significant (χ^2=25.831; df=6; p<0.001).

Among 22 patients with steatosis, corpus atrophy was identified in 7 patients (31.8%), antral atrophy in 2 patients (9.1%), HP-associated gastritis in 7 patients (31.8%), and normal findings in 6 patients (27.3%)[13].

All 11 patients with hepatitis demonstrated HP-associated gastritis (100.0%).

Among 23 patients with cirrhosis, HP-associated gastritis was identified in 9 patients (39.1%), corpus atrophy in 7 patients (30.4%), and antral atrophy in 7 patients (30.4%). These findings indicate that morphofunctional changes of the gastric mucosa vary depending on the type of liver disease[14].

Analysis according to the type of liver disease demonstrated significant differences in Gastropanel findings among patients with steatosis, hepatitis, and cirrhosis. In patients with steatosis, the condition of the gastric mucosa appeared relatively heterogeneous, including corpus atrophy, HP-associated gastritis, antral atrophy, and normal findings. This may indicate that morphofunctional changes of the gastric mucosa in steatosis are not yet fully unified in their pathological direction. Nevertheless, the presence of atrophic changes in this group confirms the necessity of comprehensive evaluation not only of liver pathology but also of the upper gastrointestinal mucosa[15].

In the hepatitis group, the detection of HP-associated gastritis in all patients deserves particular attention. This finding may reflect a possible association between chronic inflammatory processes, immunometabolic disturbances, and Helicobacter pylori infection. In patients with hepatitis, inflammatory changes predominated in the gastric mucosa, whereas atrophic processes were less frequent, which may be associated with disease duration and stage.

Patients with liver cirrhosis demonstrated a relatively higher prevalence of corpus and antral atrophy. This finding suggests the development of more profound morphofunctional disturbances of the gastric mucosa in cirrhosis. Portal hypertension, impaired microcirculation, hormonal and metabolic disturbances, alterations in bile acid metabolism, and chronic intoxication may weaken the protective mechanisms of the gastric mucosa. As a result, favorable conditions arise for the development of inflammation, atrophy, and functional insufficiency.

The obtained results indicate that assessment of gastric mucosal status in patients with diffuse liver diseases is of considerable clinical importance. HP-associated gastritis, atrophic gastritis, intestinal metaplasia, and dysplasia are recognized stages in gastric carcinogenesis. Therefore, the combined use of Gastropanel testing, HP diagnostics, and endoscopic examination in patients with diffuse liver diseases may facilitate early detection of high-risk gastric mucosal alterations. This approach is also important for determining individualized preventive strategies, HP eradication therapy, gastroprotective management, and follow-up protocols.

4. Conclusion

The results of the present study demonstrated a high prevalence of morphofunctional changes of the gastric mucosa in patients with diffuse liver diseases. Helicobacter pylori infection was identified in 89.0% of patients, indicating a high prevalence of HP infection and gastric mucosal alterations in this population.

Gastropanel findings showed significant sex-related differences: HP-associated gastritis was more common in men, whereas corpus and antral atrophy predominated in women. The statistical significance of these differences suggests that sex should also be considered when evaluating gastric mucosal status in patients with diffuse liver diseases.

Analysis according to the type of liver disease revealed that HP-associated gastritis predominated in patients with hepatitis, whereas corpus and antral atrophy were relatively more frequent in patients with cirrhosis. In the steatosis group, Gastropanel findings demonstrated a more heterogeneous distribution, suggesting variable clinical manifestations of gastric mucosal alterations at this stage.

Overall, comprehensive assessment of the morphofunctional condition of the gastric mucosa in patients with diffuse liver diseases has important practical significance. Early detection of HP infection, timely eradication therapy, dynamic monitoring of atrophic changes, and the use of gastroprotective strategies may help prevent gastric mucosal complications and precancerous conditions.

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