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Change in the Incidence of *Helicobacter pylori* Diagnosed by Endoscopic Biopsy Before and After the COVID-19 Pandemic

Endoskopik Biyopsi ile Tanı Konulan *Helikobakter pylori* İnsidansının COVID-19 Pandemisi Öncesi ve Sonrası Değişimi

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Abstract

Objective: *Helicobacter pylori* (*HP*) is a Gram-negative, microaerophilic bacterium linked to chronic gastritis, peptic ulcer disease, and gastric carcinoma. Although its global prevalence has declined due to improved sanitation and eradication therapies, the coronavirus disease-2019 (COVID-19) pandemic has altered hygiene behaviors, antibiotic use, and healthcare access, potentially impacting *HP* epidemiology and related histopathological outcomes. This study aimed to compare the prevalence of *HP* infection and the associated histopathological findings in gastric biopsies obtained during upper gastrointestinal endoscopies before and after the COVID-19 pandemic.

Method: This retrospective study included 338 individuals who underwent upper gastrointestinal endoscopy with gastric biopsy at a tertiary hospital. Patients were grouped by endoscopy year: Pre-pandemic (2018, n=122) and post-pandemic (2025, n=216). Evaluated histopathological parameters included the presence of *HP*, colonization intensity, chronic inflammation, neutrophil activity, glandular atrophy, and intestinal metaplasia. Those with prior eradication therapy were excluded. Analyses were conducted using SPSS v27.0.

Results: Mean age was 52.5±13.5 years; 54.4% were female and 45.6% were male. *HP* prevalence was significantly lower in 2025 ($p<0.05$), whereas colonization intensity and intestinal metaplasia severity were significantly higher ($p<0.05$). Chronic inflammation and

Öz

Amaç: *Helicobakter pylori* (*HP*), kronik gastrit, peptik ülser hastalığı ve gastrik karsinom ile ilişkili Gram-negatif, mikroaerofilik bir bakteridir. Küresel prevalansı, iyileşen sanitasyon koşulları ve eradikasyon tedavileri sayesinde azalmış olsa da, koronavirüs hastalığı-2019 (COVID-19) pandemisi hijyen davranışlarını, antibiyotik kullanımını ve sağlık hizmetlerine erişimi değiştirmiş; bu durum *HP* epidemiyolojisini ve ilişkili histopatolojik sonuçları potansiyel olarak etkilemiştir. Bu çalışmanın amacı, COVID-19 pandemisi öncesi ve sonrası dönemde üst gastrointestinal endoskopi sırasında alınan mide biyopsilerinde *HP* enfeksiyonu prevalansını ve buna eşlik eden histopatolojik bulguları karşılaştırmaktır.

Yöntem: Bu retrospektif çalışmaya, üçüncü basamak bir hastanede üst gastrointestinal endoskopi sırasında gastrik biyopsi yapılan 338 birey dahil edildi. Hastalar endoskopi yılına göre pandemi öncesi (2018, n=122) ve pandemi sonrası (2025, n=216) olmak üzere iki gruba ayrıldı. Değerlendirilen histopatolojik parametreler; *HP* varlığı, kolonizasyon yoğunluğu, kronik enflamasyon, nötrofil aktivitesi, glandüler atrofi ve intestinal metaplazi idi. Daha önce eradikasyon tedavisi alan hastalar çalışma dışı bırakıldı. İstatistiksel analizler SPSS v27.0 kullanılarak yapıldı.

Bulgular: Ortalama yaş 52,5±13,5 yıl olup; katılımcıların %54,4'ü kadın, %45,6'sı erkekti. *HP* prevalansı 2025 yılında anlamlı olarak daha düşük bulundu ($p<0,05$); buna karşın kolonizasyon yoğunluğu ve intestinal metaplazi şiddeti daha yüksekti ($p<0,05$). Kronik

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Abstract

neutrophil activity were lower in 2025 (p<0.05). Endoscopies due to dysphagia increased significantly post-pandemic (p<0.05).

Conclusion: Post-pandemic findings suggest a lower prevalence of *HP* infection but increased severity of histopathological changes. This pattern may reflect an ongoing decline in *HP* prevalence in Turkey, as well as changes in healthcare access and antibiotic exposure during and after the COVID-19 period. Close follow-up of patients with high-grade colonization remains important due to the potential risk of premalignant mucosal changes.

Keywords: Coronavirus, *Helicobacter pylori*, histopathology, pandemic

Öz

enflamasyon ve nötrofil aktivitesi 2025 yılında daha düşük saptandı (p<0,05). Disfaji nedeniyle yapılan endoskopilerin pandemi sonrası dönemde anlamlı şekilde arttığı görüldü (p<0,05).

Sonuç: Pandemi sonrası döneme ait bulgular, *HP* enfeksiyonu prevalansında azalma olmasına karşın daha şiddetli histopatolojik değişikliklerin görülebildiğini düşündürmektedir. Bu durum, Türkiye'de *HP* prevalansında zaman içerisinde gözlenen genel azalma eğiliminin yanı sıra, pandemi döneminde sağlık hizmetlerine erişimdeki değişiklikler ve antibiyotik kullanımındaki artış gibi faktörlerle ilişkili olabilir. Premalign mukozal değişiklik riski nedeniyle yüksek dereceli kolonizasyona sahip hastaların yakından izlenmesi önemlidir.

Anahtar kelimeler: *Helikobakter pylori*, histopatoloji, koronavirüs, pandemi

Introduction

Helicobacter pylori (*HP*) is a Gram-negative, spiral-shaped bacterium that survives in microaerophilic environments. Owing to its complex flagellar structure, *HP* is motile, and its flagellum comprises three main components: The basal body, hook, and filament. It typically has unipolar flagellas, which enable its mobility within the viscous environment of the gastric mucosa (1).

HP is an infectious pathogen primarily transmitted via fecal-oral, oral-oral, or gastric-oral routes. Despite successful eradication therapy, reinfection or persistence of the bacterium remains possible throughout life. In most populations, the initial acquisition occurs during childhood, particularly among children living in poverty, crowded environments, or regions with inadequate sanitation (2).

Studies have shown that *HP* affects approximately 4.4 billion people worldwide, accounting for more than half of the global population (3). A meta-analysis published in 2024 reported that the global prevalence of *HP* infection, which was approximately 58% in the 1980s, has declined to approximately 43% in recent years. This decline has been more pronounced in adults, whereas the prevalence among children and adolescents has decreased more slowly (4). In a study conducted in the United States, the prevalence of *HP* was estimated to be approximately 36% (5). A comprehensive review analyzing data from 35 European countries revealed that *HP* prevalence was significantly higher in Eastern and Southern Europe compared to Northern and Western Europe, and that the infection rate has declined by an average of 3.1% annually since 1990 (6).

In a large retrospective analysis from Turkey including 40,784 patients tested between 2018 and 2023, the overall *HP* stool antigen positivity rate was reported as 14.47%, with notable regional differences (highest in Southeastern Anatolia: 25.71%) (7). A recent, large, single-center cohort study in Turkey among older adults reported an overall *HP* prevalence of 56.3%. (8)

HP has been linked to a variety of diseases, including malignancies, in numerous studies. Its role in the pathogenesis of gastric adenocarcinoma has been well elucidated in the literature. The carcinogenic process follows a sequence of histopathological changes in the gastric epithelium, beginning with non-atrophic chronic gastritis, progressing to multifocal atrophic gastritis, followed by intestinal metaplasia, then low-grade and high-grade dysplasia, ultimately leading to adenocarcinoma (9). In addition to being a recognized risk factor for chronic gastritis, peptic ulcer disease, and gastric adenocarcinoma, *HP* has been implicated in several hematological disorders. Its association with benign hematologic conditions such as idiopathic thrombocytopenic purpura, as well as with gastric mucosa-associated lymphoid tissue lymphoma, has been well documented in the literature (10,11).

The coronavirus disease-2019 (COVID-19) pandemic has led to considerable shifts in dietary habits, increased public awareness of gastrointestinal health, and enhanced participation in cancer screening programs. These changes may have influenced the diagnostic rates of *HP* infection. Therefore, the present study aimed to evaluate temporal changes in the incidence of *HP* infection among patients undergoing upper gastrointestinal endoscopy (UGE) before and after the COVID-19 pandemic.

Materials and Methods

This retrospective study included 338 individuals who underwent UGE with biopsy: 122 patients in 2018 (prior to the COVID-19 pandemic) and 216 patients in 2025. Endoscopic data and biopsy results were collected and recorded from the hospital information system with the approval of the Ethics Committee of the University of Health Sciences Turkey, İstanbul Training and Research Hospital (date: 11.07.2025, approval number: 188).

The inclusion criteria for the research were as follows:

1. Complete data available in the hospital information system,
2. Undergoing UGE due to dyspeptic complaints at age 18 or older,
3. Complete documentation of endoscopic findings,
4. Biopsy taken during endoscopy with fully recorded histopathological results,
5. Endoscopy performed by a senior gastroenterologist in accordance with standard diagnostic protocols.

The exclusion criteria were defined as follows:

1. Age under 18 years,
2. Use of proton pump inhibitors, antihistamines, or antacid agents within the four weeks prior to endoscopic examination,
3. History of *HP* eradication therapy,
4. Incomplete endoscopic or biopsy data in the hospital system,
5. Emergency endoscopy (e.g., gastrointestinal bleeding, variceal hemorrhage, stent placement),
6. Diagnosis of malignancy,
7. Presence of diseases affecting gastrointestinal microbiota (e.g., ulcerative colitis, Crohn's disease, indeterminate colitis, eosinophilic colitis, malabsorption syndromes).

All biopsy specimens obtained from the patients were stained with hematoxylin and eosin and evaluated by experienced pathologists.

Gastric biopsies for *HP* evaluation were routinely obtained from the antrum in accordance with institutional practice.

Ethics approval for this research was obtained from the Ethics Committee of the University of Health Sciences Turkey, İstanbul Training and Research Hospital (date: 11.07.2025, approval number: 188). Because the research had a retrospective design and used anonymized patient data, the ethics committee waived the requirement for written informed consent. All procedures were performed in accordance with the ethical standards of the institutional research committee and the principles of the Declaration of Helsinki (1964) and its later amendments.

Statistical Analysis

Descriptive statistics were presented as means, standard deviations, medians, minimum and maximum values, and as frequencies and percentages for categorical variables. The distribution of variables was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The Mann-Whitney U test was used for independent quantitative variables with non-normal distributions, and the chi-square test was used for independent categorical variables. All analyses were performed using SPSS Statistics 27.0 (Armonk, New York, USA: IBM Corp.).

Results

The study population had a mean age of 52.5±13.5 years. Among the participants, 154 (45.6%) were male and 184 (54.4%) were female. A total of 122 patients (36.1%) from 2018 and 216 patients (63.9%) from 2025 were included in the study. Of the enrolled patients, 180 (53.3%) underwent UGE for dyspepsia, 146 (43.2%) for malignancy screening, and 12 (3.6%) for dysphagia. Endoscopic findings were normal in 55 patients (16.3%), whereas pathological findings were reported in 283 patients (83.7%) (Table 1).

Biopsy samples were obtained from the antrum in 331 patients (97.9%) and from the corpus in 7 patients (2.1%). Histopathological evaluation revealed chronic inactive gastritis in 148 patients (43.8%), chronic active gastritis in 182 patients (53.8%), and atrophic gastritis in 8 patients (2.4%) (Table 1).

HP was detected in 178 (52.7%) of all patients included in the study. Among these *HP*-positive patients, the degree of *HP* was reported as 1 (+) in 47 (13.9% of all patients), 2 (+) in 34 (10.1% of all patients), and 3 (+) in 97 (28.7% of all patients) (Table 1).

Among the patients included in the study, 168 (49.7%) exhibited grade 1 (+) chronic inflammation, 142 (42%) had grade 2 (+) chronic inflammation, and 28 (8.3%) had grade 3 (+) chronic inflammation. Neutrophil activity was detected in 181 patients (53.6%). Of these, 37 patients (10.9%) had grade 1 (+), 90 patients (26.6%) had grade 2 (+), and 54 patients (16%) had grade 3 (+) neutrophil activation (Table 1).

Glandular atrophy was detected in 13 patients (3.8%) who were included in the study. Among these, 4 patients (30.8% of those with atrophy) had grade 1 glandular atrophy, and 9 patients (69.2%) had grade 2 glandular atrophy (Table 1).

Intestinal metaplasia was detected in 24 (7.1%) of the patients included in the study. Among these patients, 1 (+) intestinal metaplasia was observed in 8 patients (33.3% of those with metaplasia); 2 (+) intestinal metaplasia in 3 patients (12.5%); and 3 (+) intestinal metaplasia in 13 patients (54.2%) (Table 1).

There were no statistically significant differences in age or gender distributions between the groups diagnosed in 2018 and 2025 (p>0.05) (Table 1).

Table 1. Demographic, endoscopic and histopathological comparison of patients examined in 2018 vs. 2025

		Year of examination 2018 (n=122)				Year of examination 2025 (n=216)				p	
		Mean ± SD/n-%			Median	Mean ± SD/n-%			Median		
Age (year)		52.0	±	11.6	53.0	52.7	±	14.5	52.0	0.398	m
Gender	Male	55		45.1%		99		45.8%		0.894	x^2
	Female	67		54.9%		117		54.2%			
Indication for endoscopy											
Dyspepsia		64		52.5%		116		53.7%		0.826	x^2
Malignancy screening		58		47.5%		88		40.7%		0.225	x^2
Dysphagia		0		0.0%		12		5.6%		**0.008**	x^2
Endoscopic findings	Normal	14		11.5%		41		19.0%		0.073	x^2
	Pathological	108		88.5%		175		81.0%			
Biopsy findings											
Chronic inactive gastritis		33		27.0%		115		53.2%		**0.000**	x^2
Chronic active gastritis		84		68.9%		98		45.4%			
Atrophic gastritis		5		4.1%		3		1.4%			
Patients with *HP* on biopsy		84		68.9%		94		43.5%		**0.000**	x^2
HP grade	1 (+)	32		38.1%		15		16.0%		**0.000**	x^2
	2 (+)	20		23.8%		14		14.9%			
	3 (+)	32		38.1%		65		69.1%			
Grade of chronic inflammation	1 (+)	43		35.2%		125		57.9%		**0.000**	x^2
	2 (+)	79		64.8%		63		29.2%			
	3 (+)	0		0.0%		28		13.0%			
Neutrophil activity		84		68.9%		97		44.9%		**0.000**	x^2
Grade of neutrophil activity	1 (+)	23		27.4%		14		14.4%		0.080	x^2
	2 (+)	40		47.6%		50		51.5%			
	3 (+)	21		25.0%		33		34.0%			
Glandular atrophy		5		4.1%		8		3.7%		0.856	x^2
Grade of glandular atrophy	I	0		0.0%		4		50.0%		0.105	x^2
	II	5		100%		4		50.0%			
Intestinal metaplasia		10		8.2%		14		6.5%		0.555	x^2
Grade of intestinal metaplasia	1 (+)	4		40.0%		4		28.6%		**0.045**	x^2
	2 (+)	3		30.0%		0		0.0%			
	3 (+)	3		30.0%		10		71.4%			

m: Mann-Whitney U test, x^2: Chi-square test (Fischer's test), value are presented as minimum, maximum, median, mean ± standard deviation (SD) and number (%), *HP*: *Helicobacter pylori*

Within the study cohort, the proportion of patients undergoing endoscopy for dysphagia was higher in 2025 than in 2018. This finding reflects only the selected study population and should not be interpreted as indicating a population-based temporal trend.

The proportion of subjects diagnosed with chronic inactive gastritis based on biopsy results was significantly higher in the 2025 group than in the 2018 group ($p<0.05$) (Table 1).

In the group diagnosed in 2025, the HP positivity rate on biopsy was significantly lower than in the 2018 group ($p<0.05$). However, the degree of HP colonization was significantly higher in the 2025 group than in the 2018 group ($p<0.05$) (Table 1).

The degree of chronic inflammation was significantly lower in patients diagnosed in 2025 than in patients diagnosed in 2018 ($p<0.05$) (Table 1).

Neutrophil activity was also significantly lower in the 2025 group than in the 2018 group ($p<0.05$) (Table 1).

No statistically significant difference was observed in the prevalence of intestinal metaplasia between the groups diagnosed in 2018 and those diagnosed in 2025 ($p>0.05$). However, the degree of intestinal metaplasia was significantly higher in the 2025 group than in the 2018 group ($p<0.05$) (Table 1).

Discussion

The COVID-19 pandemic has disrupted individuals' daily routines and habits in profound and multifaceted ways. One of the most prominent areas in which this impact has been observed is dietary behavior. Government-imposed lockdowns, social isolation, disruptions in food supply chains, and heightened psychological stress have collectively led to significant shifts in nutritional patterns across the general population (12). The premise of our research is that such changes are most evident in the gastrointestinal system and may influence the composition and dynamics of the human microbiota.

In the study cohort, the proportion of patients undergoing UGE for dysphagia was significantly different in 2025 compared with 2018. However, this finding pertains only to the selected study population and does not represent overall endoscopic practice patterns in the respective years. Therefore, it should not be interpreted as evidence of a true temporal increase in dysphagia-related endoscopies. Differences in endoscopic indication profiles between the two cohorts may partially explain the observed variation in histopathological severity and should be considered when interpreting temporal comparisons. This potential selection effect represents an inherent limitation of retrospective cohort-based comparisons. Another possible explanation is the growing proportion of the geriatric population in our country over recent years, which may have contributed to the rising prevalence of esophageal disorders (13).

In Turkey, routine screening for gastrointestinal cancers is generally performed in outpatient clinics for individuals aged 50 years and older. Despite these screening efforts, gastrointestinal malignancies remain highly prevalent in our country, prompting ongoing research to raise awareness and identify relevant risk factors. One such study conducted in Turkey identified age, sex, body mass index, number of children, family history of cancer, and chronic comorbidities as potential risk factors for gastrointestinal cancers (14). In another study conducted in eastern Turkey, 1.176 endoscopic procedures performed over the course of a year were analyzed. These procedures included both upper and lower gastrointestinal evaluations, resulting in the diagnosis of 14 esophageal cancers, 49 gastric cancers, and 10 colorectal cancers. These findings once again highlight the considerable burden of gastrointestinal cancers in our population (15).

In our research, the prevalence of chronic inactive gastritis identified during UGEs in 2025 was significantly lower than in 2018. The increased detection of chronic inactive gastritis in recent years has been attributed to the growing use of routine endoscopic procedures, particularly for cancer screening in asymptomatic individuals. Several studies have demonstrated that minimal chronic inactive gastritis closely resembles the gastroscopic findings in patients with a history of *HP* infection who have undergone successful eradication therapy. Minimal chronic inactive gastritis is a common finding in routine histopathological examinations. However, it remains unclear whether this condition represents a true histopathological entity or simply a variant of normal gastric mucosa (16). In our study, individuals with a known history of *HP* treatment were excluded; therefore, any association between chronic inactive gastritis and prior *HP* infection was ruled out in our patient cohort.

Studies conducted worldwide have reported varying results regarding temporal trends in *HP* prevalence. While some studies have demonstrated a significant decline in prevalence over the years, others have found no meaningful change. Some reports have shown a significant increase in *HP* positivity among patients with gastric cancer. A meta-

analysis including data from 62 countries between 1970 and 2016 investigated the global prevalence of *HP* and highlighted substantial regional variations. It was estimated that more than half of the world's population is infected with *HP*, and the findings emphasized the need for region-specific eradication strategies (3).

Another meta-analysis of data from 410,879 participants across 73 countries on six continents reported a global prevalence of *HP* infection of 44.3%. This rate was 50.8% in developing countries and 34.7% in developed countries. The global prevalence was slightly higher among men (46.3%) than among women (42.7%). Although there was a downward trend in prevalence between 2009 and 2016 compared to 2000-2009, the decline was not statistically significant (17).

A separate meta-analysis conducted in China evaluated studies published between 1990 and 2019, including 412 eligible studies comprising a total of 1,377,349 participants. The overall prevalence of *HP* infection in China was 44.2%, with an estimated 589 million individuals infected. The prevalence decreased significantly, from 58.3% in 1983-1994 to 40.0% in 2015-2019 (18).

A further meta-analysis examining studies published between the 1980s and 2022 revealed a global downward trend in *HP* prevalence, particularly during the period from 2011 to 2022 (19).

A study conducted in Turkey retrospectively evaluated patients who underwent endoscopic biopsy due to dyspeptic complaints in 2019 and 2020, and found no significant difference in *HP* incidence during the pandemic period (20). In contrast, a study from Romania analyzing gastric cancer cases between 2018 and 2024 reported a significantly higher rate of *HP* positivity in the post-pandemic period compared to the pre-pandemic era (21). However, in our research, *HP* prevalence was significantly lower in the post-pandemic period than in the pre-pandemic period. Importantly, the decline observed in our post-pandemic cohort should not be interpreted as a direct effect of COVID-19, since previous studies from Turkey have already demonstrated a decreasing trend in *HP* prevalence. This change may be attributed to improvements in the effectiveness of eradication therapies developed over recent years (22,23). Another possible explanation is the fecal–oral and oral–oral transmission routes of *HP*. Improvements in hand hygiene, drinking water quality, general living conditions, and overall socio-economic status may have contributed to a reduction in transmission rates (24). A further potential factor is the widespread and at times inappropriate use of antibiotics during the COVID-19 pandemic, which may have inadvertently targeted asymptomatic *HP* infections, thereby reducing overall prevalence (25). Additionally, increased health awareness during the pandemic may have led individuals to seek medical attention earlier for gastrointestinal symptoms. As a result, individuals diagnosed with *HP* may have received eradication therapy, which may have contributed to the lower observed prevalence. To avoid this confounding effect, we excluded patients with a history of *HP* eradication therapy from our study.

Among *HP* virulence factors, colonization factors include blood group antigen-binding adhesin, sialic acid-binding adhesin, outer inflammatory protein A (OipA), and *Helicobacter* outer membrane protein Q. On the other hand, virulence factors essential for gastric pathogenicity include effector proteins such as cytotoxin-associated gene A (CagA), vacuolating cytotoxin A (VacA), high-temperature requirement A, as well as outer membrane vesicles (26). *HP* comprises multiple strains that differ significantly in virulence, antibiotic resistance, and pathogenic potential. Some strains show higher virulence and are more closely linked with severe diseases. Among the most important virulence factors of *HP* are CagA and VacA. Strains carrying the CagA protein are defined as oncogenic proteins and are associated with a higher risk of ulcer or gastric carcinoma development (27). Although all *HP* strains carry the *VacA* gene, there are differences among allelic variants. The s1/m1 type has been shown to exhibit the highest vacuolating activity and to be more toxic to gastric epithelial cells. The presence of antibodies against VacA has been found to increase the risk of gastric cancer and peptic ulcer. Furthermore, VacA is defined as a multifunctional toxin that not only induces vacuole formation but also triggers various cellular processes such as cell necrosis, apoptosis via the mitochondria, and endoplasmic reticulum stress (26).

Our results show that although the prevalence of *HP* detected via endoscopic biopsy was significantly lower in 2025 than in 2018, the density of *HP* in the gastric mucosa was significantly higher in 2025. Additionally, the degree of intestinal metaplasia in biopsy specimens was significantly greater. Although virulent *HP* strains are often associated with increased inflammatory activity, intestinal metaplasia is considered a long-term consequence of chronic mucosal injury and may persist or progress even when acute inflammatory markers, such as neutrophil activity, decrease.

In the post-pandemic period, altered healthcare access and delayed endoscopic evaluation may have resulted in a more selective patient population presenting with more advanced mucosal changes. Moreover, widespread antibiotic exposure during the COVID-19 pandemic may have reduced active inflammation in some patients while allowing resistant strains to persist and contribute to chronic epithelial transformation. These factors may partly explain the coexistence of lower inflammatory activity and higher intestinal metaplasia severity observed in our study. These findings suggest that, in current clinical practice, patients with *HP* detected in the gastric mucosa should be monitored more closely for peptic ulcer disease, atrophic gastritis, intestinal metaplasia, and even gastric cancer. Patients should receive thorough information about the importance of attending follow-up visits promptly. This situation raises the possibility that more resistant *HP* strains may be colonizing hosts due to increasing antibiotic resistance within the population. It further suggests that high-virulence *HP* strains, such as the CagA, VacA, s1m1, OipA, and i1 variants, may have gradually become predominant in the gastric mucosa.

Study Limitations

This research has some limitations. Its retrospective design inherently limits causal inference and may be susceptible to selection or information bias. The research was conducted in a single tertiary-care center, which may limit the generalizability of the findings to broader populations. Molecular analysis of *HP* strains was not performed; such analysis could have provided further insight into the observed increase in colonization density and intestinal metaplasia. Gastric biopsies were not obtained according to the updated Sydney protocol, which recommends collecting five biopsies from standardized gastric sites and placing them in two separate containers. Instead, sampling was performed predominantly from the antrum in accordance with institutional routine practice. This limited sampling approach may have underestimated corpus-predominant pathology, including atrophy and intestinal metaplasia, and influenced comparisons between the pre-pandemic and post-pandemic groups. Another limitation is the patchy distribution of *HP* within the gastric mucosa. Since infection and related histopathological changes may be focal, biopsy sampling from limited sites may result in underestimation or misclassification of *HP* density, inflammatory activity, intestinal metaplasia, and atrophy. This potential sampling bias should be considered when interpreting comparisons of severity scores between the pre-pandemic and post-pandemic groups.

Conclusion

In this study, we evaluated the temporal changes in *HP* prevalence and histopathological findings among patients undergoing UGE before and after the COVID-19 pandemic. Although the overall prevalence of *HP* infection was significantly lower in 2025 than in 2018, the intensity of *HP* colonization and the degree of intestinal metaplasia were significantly higher in the post-pandemic period. These findings suggest that despite the declining infection rates, potentially driven by improved hygiene, antibiotic exposure during the pandemic, and increased public awareness, the persistence of highly virulent and possibly antibiotic-resistant strains may contribute to more severe mucosal damage and precancerous changes. The predominance of more aggressive strains, such as those carrying CagA, VacA s1/m1, OipA, and i1 genotypes, may explain the higher colonization density and progression toward intestinal metaplasia. These results underscore the importance of not only detecting the presence of *HP* but also assessing its colonization density and related mucosal changes. Clinicians should remain vigilant in the long-term follow-up of *HP*-positive patients, particularly those with high-grade colonization, due to their elevated risk of atrophic gastritis, intestinal metaplasia, and gastric cancer.

Ethics

Ethics Committee Approval: Ethics approval for this research was obtained from the Ethics Committee of the University of Health Sciences Turkey, İstanbul Training and Research Hospital (date: 11.07.2025, approval number: 188).

Informed Consent: Written informed consent was waived because the study was retrospective.

Footnotes

Authorship Contributions

Concept: V.C.Ç., F.A., Design: V.C.Ç., Y.G., M.A., B.K.K., F.A., Data Collection or Processing: V.C.Ç., Y.G., G.Y., Analysis or Interpretation: V.C.Ç., M.A., B.K.K., G.Y., F.A., Literature Search: V.C.Ç., Y.G., M.A., B.K.K., G.Y., Writing: V.C.Ç.

Conflict of Interest: No conflict of interest was declared by the authors.

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