

A short communication regarding the trends and prevalence of H. Pylori in unselected gastric mucosal biopsy samples at a tertiary care hospital in Karachi, Pakistan: a five-year retrospective study

Naseem Ahmed¹, Sambreen Zameer², Shamas Ghazanfar³, Zarmina Islam⁴, Hafsa Nazir Jatoi⁵, Manal Khan⁶

Abstract

A spiral gram-negative bacteria, known as helicobacter pylori, is frequently discovered in the stomach and is linked to a number of clinical disorders. Understanding its prevalence and trends is crucial for both improved clinical outcomes as well as greater epidemiological insight into the region. The current retrospective study was planned to analyse the prevalence and frequency trends of helicobacter pylori in gastric mucosal samples from a Karachi-based tertiary care centre. Data from a 5-year period was analysed. Sampled individuals' age, gender, site of infection and histopathological findings were noted. A decreasing trend in helicobacter pylori infections in biopsy samples was observed. Gender and age showed no significant association ($p > 0.05$), while infection site and histopathological findings exhibited significant correlations ($p < 0.05$). Antrum predominated for all types of gastritis. The study highlighted a declining trend in helicobacter pylori prevalence in Karachi over 5 years. Further multicentre studies with larger samples may provide deeper insights into helicobacter pylori trends in Pakistan.

Keywords: Gastritis, Antrum, H. Pylori, Gastric ulcer.

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Introduction

A spiral gram-negative bacteria, called helicobacter pylori (H. pylori) is frequently discovered in the stomach, and is linked to several clinical disorders. The bacteria have evolved to penetrate the mucous lining of the digestive tract, most commonly the antrum, to establish colonies. Over a long period, the infection can lead to sores, ulcers and even cancer. Given that the sickness is spread via the faecal-oral route, the incidence of H. pylori infection inside the gastrointestinal tract (GIT) might provide important information into the hygienic conditions of the relevant

^{1,2}Department of Pathology, Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan; ³⁻⁶4th Year MBBS Student, Dow Medical College, Dow University of Health Sciences, Karachi, Pakistan.

Correspondence: Naseem Ahmed. **e-mail:** naseem.ahmed@duhs.edu.pk

ORCID ID: 0000-0003-3341-7817

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population. According to the differing frequencies of H. pylori infection in stratified populations, socioeconomic status (SES) and environmental factors are likely to have a role in the development of H. pylori infection.^{1,2}

One of the pathological conditions H. Pylori has also been demonstrated to enhance the propensity for is colorectal adenomatous polyps (CAP), and its impact differs significantly based on socio-demographic associations, such as gender, age, etc. For instance, a recent study in China found that H. pylori infection coinciding with CAP was significantly higher in males as well as those aged <50 years, making them plausible risk factors.³

H. pylori affects half of the world's population, and its prevalence varies widely across the globe, ranging from 70.1% in Africa to 18.6% in Switzerland.^{1,2} In South Asia, Pakistan and India have the highest H. pylori prevalence rates (81% and 63.5%, respectively).⁴ A primary healthcare concern in low-income countries (LICs), H. pylori also has a high economic burden attributed to its diagnosis, treatment and complications. Within Pakistan, different areas have a higher frequency of H. pylori infection than the others.¹ For instance, a study of asymptomatic patients in Islamabad's rural areas found a frequency of 74.4%.⁴ Similarly, a study in Pakistan's southern city of Karachi found a frequency of 45%. In a study done among those aged 15-65 in the Pakistani population, the prevalence of H. pylori infection was 92%.⁵

The insight on the frequency of the bacteria within the communal population would provide great insight into the nature of the associated gut microbiome relative to the global population, and it may also help shed light on treatment modalities or preventative measures that can be adopted for GI disturbances. The current study was planned to determine the prevalence of H. pylori in a sample population, and its relationship with other GI diseases.

Methods and Results

The retrospective study was conducted at the Dow Medical College (DMC), Karachi, from December 2021 to June 2022 after approval from the institutional ethics review board of Dow University of Health Sciences (DUHS), Karachi, and comprised samples of stomach mucosa received for gastric

Table: Association of demographic and clinical characteristics with helicobacter pylori (H. Pylori) presence (n=183).

Variables		Presence of H. Pylori			p-value
		No	Yes	Unspecified	
Age groups	Less than 20	5	13	3	0.797
	21 to 40	15	55	20	
	41 to 60	12	34	10	
	above than 61	1	11	4	
Gender	Male	18	57	19	0.918
	Female	15	56	18	
Site of Infection	Gastric Mucosa	29	88	25	<.001
	Duodenum	1	4	5	
	Gastric Mucosa and Duodenum	3	21	7	
Histopathological findings	Ungraded Chronic Gastritis	2	12	4	<.001
	Mild Chronic Gastritis	9	44	7	
	Moderate Chronic Gastritis	9	48	15	
	Other	11	1	4	
	Duodenitis	0	1	2	
	Gastritis and Duodenitis	2	7	5	

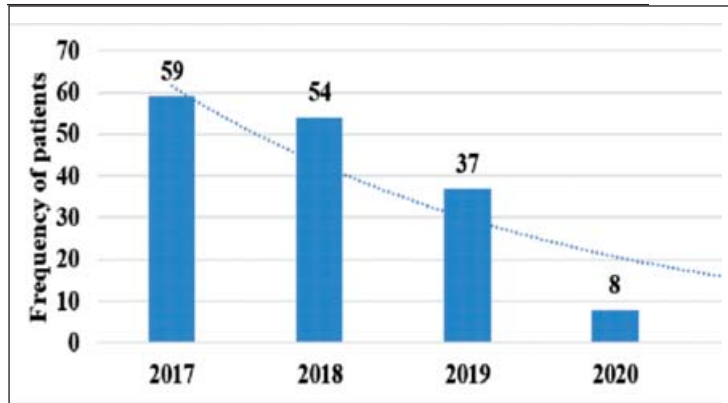


Figure: 1 No of patients presenting with helicobacter pylori (H. Pylori) infection from 2017 to 2021.

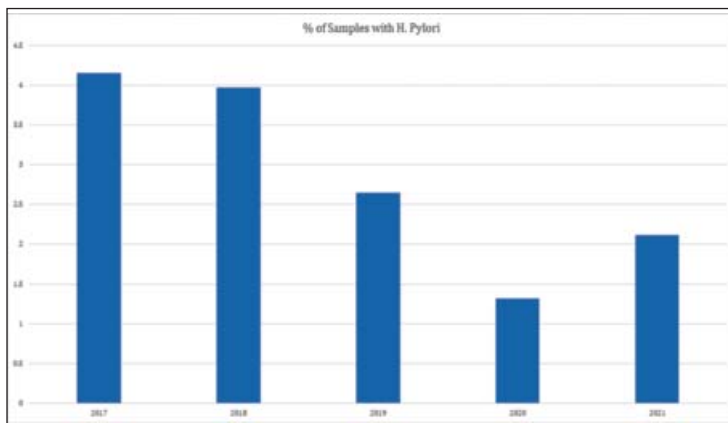


Figure: 2 Helicobacter pylori (H. Pylori) infection prevalence from 2017 to 2021.

biopsy at the Department of Pathology, Dr Ruth K.M. Pfau Civil Hospital, Karachi, a tertiary care facility, between January 1, 2017, and December 31, 2021. All autolysed specimens were excluded.

The collected data was analysed using SPSS 21. Data was expressed as mean ± standard deviation, or as frequencies and percentages, as appropriate. Linear regression, independent sample t-test and chi-square test were used as appropriate. p<0.05 was considered significant.

Of the 183 patients, 94(51.4%) were males and 89(48.6%) were females. The mean age of the sample was 38.62±16.60 years, and 90(40.1%) patients were aged 21-40 years. H. pylori was present in 113(61.7%) cases. Most of the patients presented in 2017, showing a negative linear relationship from 2017 till 2021 (Figures 1-2).

Gender and age showed no significant association (p>0.05), while infection site and histopathological findings exhibited significant correlations (p<0.05) (Table).

Discussion

H. pylori prevalence has been widely proven to have far-reaching repercussions on GIT illness outcomes. The current study found no link between the prevalence of H. pylori and gender, which contradicts the male preponderance that has been thoroughly proven in previous research.¹ The study also discovered a statistically significant link between H. pylori and the location of infection and histopathological results, which was consistent with prior research that has demonstrated that the incidence of chronic gastritis declined significantly proximal to the borderline between the antrum and body.⁶⁻⁸ When performing a linear regression of patients requiring biopsy samples for dyspepsia and, transitively, H. pylori infection, the current study found an inverse correlation over time. This coincides with data from the region spanning decades, which suggests a declining prevalence of H. pylori infection in Karachi over time.⁵ The direct clinical correlation of these findings may only be discerned on an individual basis.

A number of studies have been conducted in Pakistan to investigate the prevalence of H. pylori and its association with stomach-related illnesses. Khan et al. discovered over 10 years ago that H. pylori was the most frequent infection in 45% of patients with dyspepsia in a tertiary care hospital in Karachi.⁵ The detection rate rose to 91% in individuals with gastric ulcers, and remained at around 18% in those with intact gastric mucosa. Another study, done much more recently at Karachi’s largest tertiary care hospital, discovered that H. pylori was present in 73.3% of dyspeptic patients.⁵ Much of the regional literature indicates a high incidence of H. pylori in Pakistan, which is consistent with the current findings. A study assessed the H. pylori contamination in Karachi’s drinking water supply, and the virus was present in >4% of the

samples collected from densely populated urban areas.⁹

According to a meta-analysis of the global prevalence of *H. pylori*, Pakistan is one of the nations with the greatest *H. pylori* burden. Nigeria, Portugal, Estonia and Kazakhstan are among the other countries.⁷ *H. pylori* infection has been linked to a variety of diseases, including peptic ulcers and stomach cancer, in addition to chronic gastritis. However, oddly enough, many clinical outcomes do vary largely across geographic and ethnic lines. It has been hypothesised that the genetic diversity of the bacteria itself and subsequent differences arising in pathogenicity may be responsible; though, differences in cultural practices and habits may have a much greater role.³ A 2019 study examined the risk variables related with *H. pylori* prevalence in China. Up to age 51-60 years, there was an increasing trend in *H. pylori* infection. However, beyond that point, the infection rate began to decline perhaps as a result of increased mortality in older age groups and loss of follow-up. The total prevalence was determined to be 52% and included factors such as age, marital status, water source, consumption of garlic, and alcohol intake.¹⁰

The current study has limitations as it was a single-centre research with a retrospective design. Additionally, the study only included individuals who received a biopsy, potentially omitting patients with milder or asymptomatic *H. pylori* infections. Future research should be multi-centred and ideally have a larger sample size including those with asymptomatic *H. pylori* infections.

Conclusion

H. pylori infection was found to be common in stomach mucosal samples from patients with chronic gastritis. The infection was found to be predominantly located in the antrum of the stomach, and demonstrated a decreasing trend of prevalence over time.

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Conflict of Interest: None.

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AUTHORS' CONTRIBUTIONS:

NA: Supervision, design, conception and revision.

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SG: Supervision, conception, drafting, data collection, analysis, interpretation and revision.

ZI: Drafting, data analysis, interpretation, and revision.

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