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Frequency and association of H pylori with severity of Gastritis according to age and gender: A Retrospective Study conducted at a Tertiary Care Hospital in Karachi, Pakistan.

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ABSTRACT… Objective: To observe the frequency of H. pylori in relation to the type, severity, and anatomical site of gastritis according to age and gender. **Study Design:** Retrospective study. **Setting:** Endoscopy Suite of Medical Unit-III, Ward 7, Jinnah Postgraduate Medical Center, Karachi. **Period:** 2nd January 2019 to 5th January 2022. **Methods:** On the patients, aged more than 12 years, who underwent upper GI endoscopy the data was analyzed using the Statistical Package for the Social Sciences version 25 using significant p-value of < 0.01. **Results:** 243 patients were included in the study. Among them 100(41.2%) had H pylori positive gastritis. Out of the total, 47% were between the ages of 26 and 40, 41% reported complaints of epigastric pain; 27% had Grade B esophagitis; 50% exhibited mild severity of gastritis and 57% had pan gastritis pertaining to the anatomical site of the gastritis. However, it's crucial to note that all these findings were statistically insignificant except its correlation with severity of gastritis, which was significant. **Conclusion:** H. pylori-associated gastritis was equally common in both genders in younger age group. There was a statistically significant link between H. pylori infection and severity of gastritis (P-value< 0.01). Thus, the burden of gastritis can be reduced with H Pylori's early detection and treatment.

Key words: H Pylori Gastritis Pangastritis.

INTRODUCTION

Helicobacter pylori (H. pylori) is a gram-negative, spiral rod-shaped, microaerophilic bacterium that colonizes the stomach of humans and is responsible for the majority of cases of chronic gastritis worldwide.[1] Gastritis is a common condition characterized by inflammation of the stomach lining.[2] According to a study, gastric H. pylori colonization is widespread, affecting approximately 50% of people worldwide.[3] Furthermore, the widespread prevalence of gastritis raises serious public health concerns, with a prevalence of 50.8% overall in developing countries and 34.7% in developed countries, respectively.[4] In a recent investigation on the association between H. pylori and gastritis, it was discovered that 96.6% of people with active chronic gastritis also had a positive H. pylori test result.[5]

The rising burden of H pylori infection in Pakistan declares a threatening sense of urgency. The frequency of H pylori infection increases with age and declines with socioeconomic status with an exposure rate of 33% in children and 85% cases of duodenal ulcer in adults.[6] In Hyderabad, for example, about 63.5% of the patients with dyspepsia had H pylori-induced gastritis and was more frequent with increasing age.[7] This sheds light upon the poor socioeconomic status such as unhygienic living conditions and poor waste disposal systems in the slum areas of Pakistan which are susceptible to such infectious diseases.[8]

No earlier studies are available that scrutinize its distinct correlation with severity, type, and anatomical site of gastritis. This study would eventually aid in the early diagnosis of severity

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of gastritis with H. pylori and optimize necessary interventions. The gap in the literature is due to the lack of research conducted in this field of study to investigate its prevalence in each age group and gender.

The primary objective of this study is to observe the frequency of H. pylori, its histopathological presentation and the severity, type, and anatomical site of gastritis with respect to age and gender at a public sector hospital in Karachi. This study will help reduce the burden of gastritis and its associated complications in a sustainable and resource-efficient manner.

METHODS

This retrospective study was conducted in the endoscopy suite of Medical Unit -3, Jinnah Postgraduate Medical Center, Karachi, from 2nd January 2019 to 5th January 2022. (Ethical Letter No. F.2-81/2023-GENL/67/JPMC Dated: 24-05-2023). A total of 2200 cases of upper gastrointestinal endoscopies were performed. Out of which all biopsy-proven patients above the age of 12 were included. The details included the patient demographics, endoscopy findings, and gastric mucosal biopsy report. Patients with any associated malignancy (including stomach, esophagus, and oropharynx carcinoma) and liver cirrhosis were excluded. After obtaining informed consent, patients who satisfied the inclusion criteria and had endoscopies throughout the study period were included one after the other in a sequential manner.

Using a standard approach and an Olympus fibre optic gastro-duodenoscope, endoscopic examination of patients was carried out.[9] The instruments were cleaned with cetrimide, 70% alcohol, and glutaraldehyde (Cidex®), and run in distilled water for up to half an hour in between endoscopic procedures.[9] Vital signs were checked and the patient was placed in the left lateral decubitus position.[9] All anatomical sections of the stomach, oesophagus, and first and second segments of the duodenum were inspected.[9] In order to get histological diagnoses and detect H pylori, pinch mucosal biopsies were taken from the stomach, antrum, and questionable areas.[9] Using the 98% sensitive Modified Giemsa stain, H. pylori infection in biopsy specimens was identified. The Modified Giemsa stain was used to diagnose H. pylori infection in biopsy specimens which has a 98% sensitivity and a 90% specificity.[9,10]

Microscopic evaluation was carried out by a Consultant Histopathologist.[11] The diagnosis of chronic gastritis was made with the Hematoxylin and Eosin stain, which was described as mononuclear cell infiltration of the lamina propria with or without plasma cells.[12] The right number of gastric biopsies, the selection of the biopsy sites, or the pathologist's expertise may all contribute to the accuracy of H. pylori detection using histology.[13] Additionally, the Sydney system, which is used to classify chronic gastritis, was used to provide data on H. pylori density, activity, chronic inflammation, atrophy, and intestinal metaplasia.[14]

The sample size was calculated by using OpenEpi software with a confidence interval of 95%. By keeping the error limit at 5%, and the anticipated frequency of H Pylori-associated gastritis as 19.5%, the sample size came out to be 237.[15]

Statistical Analysis

The data was analyzed using the Statistical Package for the Social Sciences version 23.0 using the Chi-Square test with a significant p-value of < 0.001. Descriptive statistics were used to summarize patients' demographic data, and Z-test for proportions to determine gender difference in H. pylori prevalence and association of gastritis between H. pylori positive and negative patients.[12]

Counts with percentages were reported on age, gender, presenting complaints, and other clinical parameters of gastric patients. Median with Interquartile range was reported on Hb, TLC, platelet, PT, and INR. Pearson Chi-Square test was used to test the association of clinical characteristics of patients with presence and absence of H pylori, whereas Mann Whitney U test was used to compare the median of blood parameters between two groups. P-values less

than 0.05 were considered statistically significant.

Ethical Considerations

The ethical approval for the study was obtained from The Research and Ethics Committee of Jinnah Postgraduate Medical Centre (F.2-81/2023-GENL/67/JPMC) (Dated: 24-05-2023).

RESULTS

In the present study, 243 patients were included. Among them 100(41.2%) came out to be H pylori positive gastritis and the remaining 143 (58.8%) had H pylori negative gastritis. Out of the total, the majority of patients, 94(38.7%), had ages between 26 and 40. Their mean age was 39.2 years (SD=±15.5). 128(52.7%) were males and 115(47.3%) were female patients. Of the participants, 36.6% reported epigastric pain, 13.2% experienced nausea and vomiting, 11.9% had dysphagia, and 13.6% reported complaints of abdominal pain.

Table-I presents the relationship between H. pylori and various factors such as age, gender, the severity of gastritis, and other clinical characteristics observed in patients. A significant association between the severity of gastritis/inflammation and H. pylori, as evidenced by the Pearson Chi-Square test ($p<0.01$) and portrayed in Figure-1. The frequency of H. pylori in patients was 41.2% as shown in Table-I. Among these patients, 47% were between the ages of 26 and 40. However, this difference was not statistically significant. The distribution of H. pylori was equal among males and females, with each gender having 50% frequency of H pylori but the associated p-value was insignificant.

Among those positive for H. pylori: 41% reported complaints of epigastric pain; 12% showed duodenitis in their endoscopic findings; 27% had Grade B esophagitis; 32% tested positive for endoscopic findings of erosions; 50% exhibited mild severity of gastritis/inflammation; 8% were diagnosed with a gastric ulcer; and 57% had pan gastritis pertaining to the anatomical site of the gastritis.

Table-II reports the comparison of blood parameters between H Pylori present and absent patients.

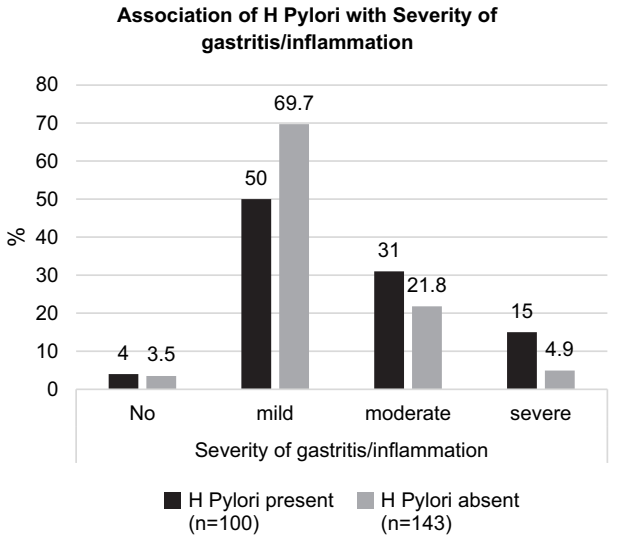

Figure-1. P Value <0.01

DISCUSSION

In Pakistan, there is a paucity of research on H pylori especially in association with gastritis prevalence and histopathological manifestations in current times.[15] The results showed that patients presenting in our endoscopy suite had a frequency of H pylori of 41.2%, which is similar to other studies carried out in Pakistan, reporting a range of 22% to 54%.[16,17,18] The frequency of H pylori is higher compared to that in other countries, including China (14.4%) and the United States (16.4%). It is possible that regional differences in accordance to risk factors and modes of H. pylori infection transmission exist.[19,20]

Our study showed no discernible difference in H. pylori frequency between genders or between age groups. These findings conflicts with some earlier studies that claimed older or male patients having a higher prevalence of H. pylori. According to a study conducted in Pakistan, 274 males out of 450 dyspeptic patients had H pylori infection, signifying its higher prevalence.[21] Coupled to this, the majority of studies revealed that the prevalence of H. pylori infection rose with age globally, reaching more than 70% in elderly patients with gastroduodenal disease.[22]

Characteristics		H Pylori present (n=100)		H Pylori absent (n=143)		P-Value
		N	%	n	%	
Age Group	≤25 years	22	22.0	32	22.4	0.11
	26 - 40 years	47	47.0	47	32.9	
	40 - 60 years	23	23.0	46	32.2	
	>60 years	8	8.0	18	12.6	
Gender	Female	50	50.0	65	45.5	0.48
	Male	50	50.0	78	54.5	
Other Presenting complains	No	18	18.0	30	21.0	0.13
	epigastric pain	41	41.0	48	33.6	
	Nausea vomiting	16	16.0	16	11.2	
	Dysphasia	14	14.0	15	10.5	
	Others	2	2.0	10	7.0	
	abdominal pain	9	9.0	24	16.8	
Endoscopic findings of the patients	No	32	32.0	41	28.7	0.41
	Duodenitis	12	12.0	27	18.9	
	Ulcers	4	4.0	10	7.0	
	Gapping GEJ	12	12.0	17	11.9	
	Gapping and hiatus hernia	1	1.0	6	4.2	
	Gapping and Gastritis	30	30.0	35	24.5	
	hiatus hernia	1	1.0	1	0.7	
	Gapping and Duodenitis	8	8.0	6	4.2	
Esophagitis	No	58	58.0	92	64.3	0.24
	Grade A esophagitis	11	11.0	7	4.9	
	Grade B esophagitis	27	27.0	41	28.7	
	Grade C esophagitis	4	4.0	3	2.1	
Endoscopic findings of erosions	No	68	68.0	100	69.9	0.74
	Yes	32	32.0	43	30.1	
Type of ulcers	No ulcer	87	87.0	111	77.6	0.48
	Esophageal Ulcers	3	3.0	6	4.2	
	Gastric Ulcer	8	8.0	17	11.9	
	Duodenal Ulcer	2	2.0	7	4.9	
	Gastric and Duodenal Ulcers	0	0.0	1	0.7	
	Esophageal and Duodenal Ulcer	0	0.0	1	0.7	
Anatomical site of gastritis	Pan Gastritis	57	57.0	74	51.7	0.71
	Antral Gastritis	23	23.0	36	25.2	
	Corpus gastritis	20	20.0	33	23.1	
*p<0.05 was considered statistically significant using Pearson Chi Square test						

Table-I. Association of H Pylori with Age, Gender, Presenting complain and other clinical Characteristics of Patients

Parameters	H Pylori Present (n=100)	H Pylori Absent (n=143)	P-Value
	Median (IQR)	Median (IQR)	
Hb	12.25(14.05-10.8)	11.9(14-10)	0.14
TLC	7.3(8.5-6.2)	6.9(8.3-5.9)	0.13
Platelets	261(319-210.5)	270(337-216)	0.50
PT	11(12.35-10.4)	11(12-10.5)	0.85
INR	1(1.015-0.95)	1(1.03-0.96)	0.47
p-value was obtained using Mann Whitney U test			

Table-II. Comparison of Hb, TLC, Platelets, PT and INR with H pylori Cases

However our results depicted that the age range of 26–40 years old had the greatest number of H Pylori patients and minimum number of such individuals were found to be above of 60 years. The present study's limited sample size which only included symptomatic patients who underwent endoscopy, may be contributing factors to this discrepancy. Other factors like socioeconomic status, dietary habits, access to healthcare, antibiotic usage, or familial living situations may influence H. pylori prevalence independently of age or gender.

Our study revealed a significant relationship ($p < 0.01$) between the severity of gastritis and H. pylori infection. Similar results were showed by an Iranian study[23] and Yakoob and Hussaini in Pakistan.[1] Our study lends credence to the idea that H. pylori is a significant contributor to the severity of gastritis. This is due to the direct pathogenic effect of H pylori bacteria on the stomach lining, causing inflammation and gastritis.[23] Secondly, if left untreated, H. pylori can also exhibit long term colonization assisted by its motility, urease production and adhesion.[24]

Lastly, environmental and social factors including dietary intake, alcohol use, smoking, and the norm of self-medication of non-steroidal anti-inflammatory drugs (NSAIDs) can all exacerbate the effects of H. pylori infection and cause more pronounced gastritis. The higher prevalence of mild gastritis from H pylori could be due to frequent and unnecessary usage and prescription of broad spectrum antibiotics, increasing antimicrobial resistance, making H pylori bacteria more resistant. A study highlighted that community pharmacies in Lahore, used a lot of antibiotics, especially broad-spectrum antibiotics being given out improperly, which highlights the delayed diagnosis of gastritis.[25]

Our study, also demonstrated that there was no connection between H. pylori infection and other endoscopic findings, such as a gapping GEJ, peptic ulcer disease, esophagitis, lab parameters or anatomical site of gastritis. Pangastritis, although having an insignificant association to H pylori, was the most prevalent. This could be due to long-standing H. pylori infection that has been allowed to progress without treatment or diagnosis.

The limited sample size, the use of histopathology as the sole technique of diagnosis for H. pylori infection, and the lack of information on the antibiotic resistance patterns of H. pylori may be additional limitations of this study. However the study may still be helpful in figuring out the prevalence of H pylori associated gastritis in Sindh.

CONCLUSION

H. pylori-associated gastritis is equally common in both genders and primarily affects people between the ages of 26 and 40. Notably, there is a statistically significant (P-value$<$0.01) relationship between the severity of gastritis and H. pylori infection. This shows that many people contract H. pylori at a younger age, and if the infection is not treated, it might persist and worsen gastritis. Thus, the burden of gastritis can be reduced with H Pylori's early detection. This study necessitates future research to better comprehend additional contributing factors and to improve methods for the effective detection and treatment of H. pylori in Pakistan.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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3	Farhana Zafar	Data entry , Data analysis & manuscriting writing.	
4	Zeeshan Ali	Conception of idea, Interpretation of results, Proof reading.	
5	Syed Masroor Ahmed	Data analysis, Interpretation of results & Proof reading.	
6	Shabnam Naveed	Interpretation of results, Analysis & Proof reading.	