ORIGINAL ARTICLE

FREQUENCY OF HELICOBACTER PYLORI INFECTION AS DETECTED BY STOOL ANTIGEN TEST IN PATIENTS WITH FUNCTIONAL DYSPEPSIA

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ABSTRACT

Objectives: To determine H. Pylori frequency in patients presenting with functional dyspepsia using H. Pylori antigen test in the stool sample.

Materials & Methods: One hundred and sixty-five adult patients presenting with symptoms suggestive of functional dyspepsia to the medical outpatients' Department of Khyber Teaching Hospital Peshawar, were tested for Helicobacter Pylori by detecting stool Helicobacter Pylori antigen. Patients with chronic debilitating illnesses or peptic ulcer disease were excluded from the study. The frequency of the positive test was calculated. The independent-sample t-test and Chi-square test were used to compare the results for different variables. A P-value of 0.05 was considered significant.

Results: Out of 165 patients, 54% were males and 46% were females. The mean age of the patients was 32±7 years, ranging from 18 to 52 years. The stool antigen test for H. Pylori was positive in 58% of patients. Proton pump inhibitor drugs significantly affect the positive results. Alanine aminotransferase levels were significantly different between the stool antigen-positive and stool antigen-negative patients.

Conclusion: Helicobacter Pylori infection is quite common in patients with functional dyspepsia. These patients with positive antigen tests should be treated with H. Pylori eradication therapy.

Keywords: Helicobacter Pylori, Dyspepsia, Stool antigen test

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INTRODUCTION

Dyspepsia is a symptom or combination of symptoms pointing toward discomfort in the upper abdomen. The most common symptoms of dyspepsia include pain epigastrium, heartburn, early satiety, abdominal fullness, bloating, belching, or discomfort in the upper abdomen.[1] In about 25 % of cases, dyspepsia has some definite cause but in the majority of cases, its cause is not known. Functional Dyspepsia is said to be present if gastric ulcer, gastritis, or any other organic problem or structural diseases are excluded.[2,3] About 25 % of the population suffer from such symptoms annually, resulting in absence from the workplace, economical burden, and poor quality of life. Some of the patients instead of seeking expert opinion, use recurrent courses of self-medication which further increase the monitory loss.[4] The exact pathophysiology of functional dyspepsia is not clear yet but Helicobacter Pylori infection has been found to be associated with this disorder, which results in alteration of gut motility and sensitivity.[5,6] It is a spiral-shaped microaerophilic, gram-negative bacterium, that varies from 3-5 micrometers in length. Its prevalence varies globally and ranges from 20 to 80%, being less common in developed countries than in developing countries.[7, 8] Although the majority of the patients with Helicobacter Pylori infection remain asymptomatic, it slowly and gradually leads to chronic gastritis in most of the patients and Peptic ulcer disease in about 15%, even gastric cancer[9,] and Functional dyspepsia in up to 25% of patients.[10]

A number of methods, both non-invasive and invasive, are available to make a diagnosis of infection with Helicobacter Pylori. Rapid urease test, the histopathological examination which is the gold standard test[11,12], and culture all need an endoscopic examination of the Stomach, which is not always feasible. The non-invasive tests include Helicobacter Pylori Ig G antibodies in the serum, urea breath test, and stool antigen test for Helicobacter Pylori. All these tests have reasonably high sensitivity and specificity of more than 85%. The urea breath test is expensive and not available everywhere.[13] Serology is easily available but it does not differentiate between past and

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present infection. It is also not used for monitoring the infection as it remains positive up to two years after successful eradication therapy.[14]

The stool antigen test uses monoclonal antibodies is easy to perform, is commonly used in epidemiologic surveys, always shows a present and active infection, and turns negative after successful eradication therapy.[15] Different strategies are followed to manage dyspepsia.[16] One of the strategies is to test patients for infection with Helicobacter Pylori and to give eradication therapy if the test is positive.[16]

The aim of our study is to find out the frequency of infection with Helicobacter Pylori by stool antigen test in patients with symptoms suggestive of dyspepsia in whom endoscopy was normal.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Outpatient Department of Medicine, Khyber Teaching Hospital Peshawar from July 2020 to June 2021. The sample size was 165, using a 30% prevalence, 95% confidence level, and 7% margin of error, under the WHO formula for sample size determination, using the non-probability convenience sampling technique. Adult patients of age more than 14 years with functional dyspepsia having symptoms for at least three months and with normal recent (within a week) upper GI endoscopy reports were included in our study. While those patients who had the chronic debilitating disease or had gastritis, peptic ulcer, Gastroesophageal reflux disease, or other pathologies on endoscopy were excluded from this study. Patients who were currently using any proton pump inhibitors were also excluded from the study group, as PPIs inhibit the growth of Helicobacter Pylori.

The institutional ethical committee approval was taken. Participants were appropriately informed and written consent was taken from them. After demographic information, patients were asked to collect stool specimens in a small bottle to be dispatched to the hospital laboratory. Helicobacter Pylori stool antigen was detected by the Enzyme-linked immunoassay technique. After collection, the Data was entered on a proforma, specially designed for this study, and was analyzed by Statistical package for social sciences (SPSS) version 26. Percentages and Frequencies were used for categorical variables while the mean and standard deviation was used for numerical variables. Chi-square was applied to compare nominal variables. While an independent sample t-test was applied to do a comparison of numerical variables. Data were presented in tables and graphs where necessary.

RESULTS

Out of the total 165 patients, 89 (54%) were male and 76 (46%) were female. The mean age of the patients was 32±7 years, ranging from 18 to 52 years. The majority of our patients (86%) belonged to the age group below 40. Table. 1

Stool antigen for H. Pylori was positive in 95 (58%) of patients and negative in 70 (42%) of cases. H. Pylori was positive in 83 % of males and 77% of females with no significant statistical difference. (P-value 0.483). Similarly, the positive rate was above 80% in all age groups with no difference between the groups. Table 2

The common symptoms of functional dyspepsia were a burning sensation in the epigastrium (64%), followed by postprandial fulness (57%), pain epigastrium (42%), and early satiety (42%). Table 3. The presence of H. Pylori was not associated with any particular symptom of functional dyspepsia. Table 3.

There was quite a significant difference in the mean level of ALT in patients with and without stool antigens of H. Pylori. (p-value 0.009). The presence of stool antigen of H. Pylori was not affected by the levels of hemoglobin, HbA1c, and BMI. Table 4.

DISCUSSION

In our study, the overall frequency of Helicobacter Pylori detected by stool antigen was 58%. Almost similar frequencies have been reported in a number of studies eg 51% by Rafee et al.[17], 64% by Awan et al[18], 57% by Najim et al[19], and 58% by Sodhi et al.[20] The first two studies were reported from Pakistan and the later two studies were reported from India. Countries with better sanitation and higher socioeconomic conditions have lower rates. For example, a study by Niknam et al from Iran found a frequency of 31%.[21] Iran is a country with advanced sanitary conditions and better hygiene. Similarly, the frequency of Helicobacter Pylori antigen in stool was reported to be 33% from Turkey and 35% from KSA.[22,23]

On the other hand countries with poor sanitation systems, overcrowding, underdeveloped infrastructures, lower level of education, and poor socioeconomic conditions have higher rates. Frequency as high as 80% has been reported from Far East Asian and African countries. [24,25]

The prevalence of Helicobacter Pylori increases with increasing age. But in our study, there was almost no significant difference amongst various age groups, except with slightly reduced frequency in the age group 40-50 years [27,28] (Table 1). This study did not show any significant difference in Helicobacter Pylori regarding other factors like gender, area of abode, cigarette smoking, and the presence of chronic viral hepatitis. Globally conflicting data are present regarding these factors. Our findings are

Table 1: Helicobacter Pylori Frequency In Different Age Groups

Age in years	Total number	Helicobacter Pylori positive	Helicobacter Pylori negative	p-value
	89 (50.3%)	44 (53%)	39 (47%)	0.233
31-40	60 (36.4%)	36 (60%0	24(40%)	0.63
41-50	18 (11%)	13 (72%0	5 (28%)	0.18
>50	4 (2.4%)	02(50%)	02 (50%)	0.76

Table 2: Helicobacter Pylori in different groups

Factor			p-value
Gender	Male 55 (62%)	Female 40 (53%)	0.23
Abode	Rural 54%	Urban 61%	0.38
Smoking	Smoker 56%	Non-smoker 59%	0.75
DM	Diabetic 70%	Non-diabetic 55%	0.14
Hypertension	Hypertensive 68%	Normotensive 56%	0.25
HCV	Positive 60%	Negative 57%	0.81
HBV	Positive 67%	Negative 57%	0.5
Use 0f antibiotics	**Yes %48**	**No 62**	**0.10**
Age groups			
< 30	**%53**		**0.475**
40-31	**%60**		
50-41	**%72**		
>50	**%58**		

Table 3: Symptoms of FD and Helicobacter Pylori

Symptom	Symptom present (%)	Symptom absent	p-value
Burning of epigastrium	(%)	53	0.4
Postprandial fulness	59	56	0.78
Pain epigastrium	57	58	0.92
Early satiety	54	60	0.4

Table 4. Helicobacter Pylori Group Statistics

	H. Pylori status	N	Mean	Std. deviation	P-value
ALT	Positive	90	30.58	11.3	0.009
	Negative	70	26.5	7.3	
HbA1c	Positive	19	8.5	1.4	0.24
	Negative	10	9.2	1.6	
Hb	Positive	95	13.35	1.16	0.25
	Negative	70	13.13	1.28	
BMI	Positive	94	22.8	2.48	0.17
	Negative	69	22.2	1.87	

supported by Alghamdi TS et al in a study conducted in the Kingdom of Saudi Arabia[23], but Soomro RA et al from Karachi found higher frequencies for males.[29]

Common symptoms of functional dyspepsia in our study did not show any correlation with Helicobacter Pylori. Hassan et al found a significant difference in the symptoms of patients with and without Helicobacter Pylori infection. Furthermore, Helicobacter Pylori eradication leads to relief from epigastric burning and pain but not from abdominal fullness and early satiety.[30]

Mean levels of ALT were significantly higher in patients with positive Helicobacter Pylori antigen tests.

(30±11 vs. 26±7, P-value 0.009). this may be attributed to the use of multiple drugs which are used for the symptomatic relief of dyspepsia. In addition, studies show higher rates of infection with Helicobacter Pylori in patients suffering from non-alcoholic fatty liver disease (NAFLD), as shown by a recent meta-analysis by Karn W et al.[32]

CONCLUSION

Functional dyspepsia is common in the younger population. Many of these patients carry Helicobacter Pylori infection. Further studies are needed to find whether Helicobacter Pylori eradication therapy would help in alleviating the symptoms of functional dyspepsia.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Abbas G: Study conception, Literature search, Data Entry. Write up, Critical review

Iqbal S: Study conception, Literature search, Data analysis, Critical review

Jamaluddin: Literature search, data entry

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.