

**Research Article**

**An assessment of helicobacter pylori infection in cases of dyspepsia**

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**ABSTRACT**

**Objective:** To determine the frequency of helicobacter pylori among patients with dyspepsia.

**Material and methods:** This cross sectional study was conducted at Department of Pathology, Quaid-e-Azam Medical College, Bahawalpur from March 2018 to September over the period of 6 months. Total 289 dyspeptic patients (as per operational definition), either male or female having age 30-70 years and having duration of  $\geq 1$  month were selected from Medical OPD of Bahawal Victoria Hospital, Bahawalpur.

**Results:** Total 289 patients with dyspepsia were selected in this study. Mean age, weight, height, BMI and duration of symptoms was  $44.11 \pm 10.492$  years,  $54.55 \pm 13.022$  Kg,  $63.63 \pm 4.230$  Inch,  $20.52 \pm 4.524$  and  $2.46 \pm 1.105$  months respectively. Out of 289 patients, H. pylori was found positive in 96 (33%) patients. Male patients were 112 (39%) and female patients were 177 (61%).

**Conclusion:** Results of this study showed a high rate of H. Pylori infection in patients of dyspepsia. Most of the patients belonged to 30-50 years and female patients were more victim of dyspepsia as compared to male. There was insignificant association of H. Pylori infection with age, gender and obesity. But H. Pylori infection was significantly associated with area of residence and duration of symptoms.

**Key words:** Dyspepsia, H. Pylori, Diagnostic test, Functional dyspepsia, Endoscopy

**INTRODUCTION**

Dyspepsia is generally defined by most clinicians as the presence of upper abdominal pain or discomfort with or without other upper gastrointestinal symptoms, such as nausea, belching, vomiting.<sup>1</sup> Dyspepsia is a common problem in the general population that frequently induces visits to the primary care physician (PCP) and most of these dyspeptic patients are managed

by their PCP, with only a minority being referred for endoscopic diagnosis.<sup>2</sup> The prevalence of dyspepsia ranges from 7% to 45% in different parts of the world.<sup>3</sup>

Dyspepsia could be due to several causes such as peptic ulcer disease (PUD), reflux disease, drugs (especially non-steroidal anti-inflammatory drugs,

NSAIDs), and idiopathic; with overlap of symptoms, making diagnosis difficult.<sup>4</sup>

The association between *Helicobacter pylori* infection and dyspeptic symptoms has long been established with HP infection having a 5% population attributable risk for dyspepsia.<sup>2</sup> *Helicobacter pylori* is an important pathogen for gastroduodenal diseases and more than 50% of the world's population are infected by this bacteria.<sup>5</sup> Its prevalence is highly variable in relation to age, ethnicity, gender, geography, socioeconomic status as well as the different strains of HP that appear to be associated with differences in virulence, the virulence factor also affecting the clinical outcome of the disease.<sup>6</sup> *Helicobacter pylori* infection produces a local mucosal and systemic antibody response, which allows potential diagnosis of the infection through detection of anti- *Helicobacter pylori* IgG antibodies in the patient's serum, saliva or urine.<sup>7</sup> Also, *Helicobacter pylori* antigens may be detected in the patient's stool.<sup>7</sup> Another form of testing relies on the ability of *Helicobacter pylori* to produce urease, an enzyme that catalyses the hydrolysis of urea to form carbon dioxide and ammonia.<sup>8</sup> Its diagnosis therefore relies on the detection of its antigen or antibody in a patient's sample, with the detection of antigen giving a more precise result, considering the waning nature of antibodies especially after an infection.<sup>9</sup>

Various diagnostic tests for *Helicobacter pylori* have therefore been developed and they can be broadly classified into invasive and non-invasive tests. The invasive tests utilize endoscopic biopsy samples for histology, culture, rapid urease test (RUT) and polymerase chain reaction (PCR), all with sensitivity and specificity that are well above 90%. The non-invasive tests, however, do not require endoscopy. These include urea breath test (UBT), immunoglobulin G and M serology, stool antigen test, saliva antibody test and urinary antibody test.<sup>10</sup>

Purpose of this study is to find out the frequency of *Helicobacter pylori* infection in dyspeptic patients. Results of this study may guide us for

the early management of *Helicobacter pylori* in dyspeptic patients.

#### **OPERATIONAL DEFINITION**

**Dyspepsia:** Dyspepsia is defined as chronic or recurrent pain or discomfort centered in the upper abdomen.

***Helicobacter pylori* infection:** Patients were labelled as having *Helicobacter pylori* infection when stool antigen test was +ve

**BODY MASS INDEX (BMI):** It is calculated as "weight in kilogram divided by height in square meter".

**Obesity:**

**Non-obese:**

BMI <30 was labelled as non-obese.

**Obese:**

BMI ≥30 was labelled as obese.

#### **MATERIAL AND METHODS**

This cross sectional study was conducted at Department of Pathology, Quaid-e-Azam Medical College, Bahawalpur from March 2018 to September over the period of 6 months. Total 289 dyspeptic patients (as per operational definition), either male or female having age 30-70 years and having duration of ≥ 1 month were selected from Medical OPD of Bahawal Victoria Hospital, Bahawalpur. Patients taking antibiotics, patients with gastric and duodenal surgery, patients with injection of any antibiotic (including Metronidazole) within 4 weeks and patients on steroids therapy due to any cause were excluded from the study. Study was approved by ethical committee and written informed consent was taken from every patient.

Weight of the patients was noted by using weighing machine and height of the patients was measured by using measuring tape and then BMI of the all the patients was calculated. Stool of the patients was taken and send to laboratory for stool antigen test for detection of *Helicobacter pylori* (+ve or -ve). All the data with Demographic profile was recorded in pre designed profroma.

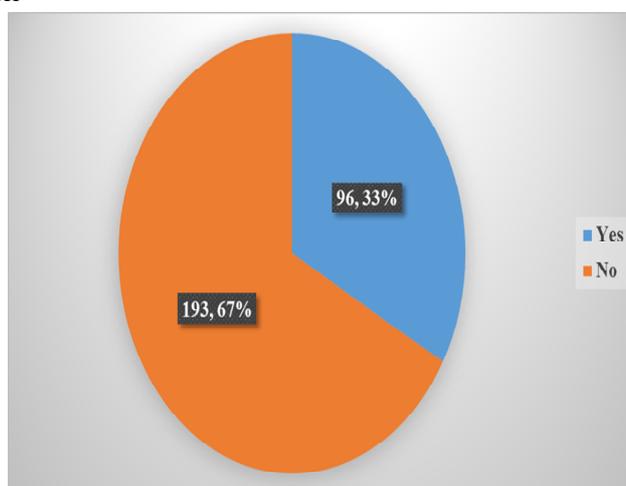
Data was entered on computer software SPSS version 16. The quantitative variables of the study i.e. age, duration of symptoms of dyspepsia, height, weight and BMI were presented as Mean±SD. The qualitative variables like gender, obesity (obese/nonobese), area of residence (rural/urban) and frequency of Helicobacter pylori was presented as frequency and percentages. Stratification was done for age, gender, duration of symptoms and obesity (obese/nonobese) and area of residence (rural/urban). Post stratification chi-square test was applied. P.value ≤0.05 was considered as significance.

## RESULTS

Total 289 patients with dyspepsia were selected in this study. Mean age, weight, height, BMI and duration of symptoms was 44.11 ± 10.492 years, 54.55 ± 13.022 Kg, 63.63 ± 4.230 Inch, 20.52 ± 4.524 and 2.46 ± 1.105 months respectively. Out of 289 patients, H. pylori was found positive in 96 (33%) patients. (Fig. 1) Patients were divided into two age groups, age group 30-50 years and age group 51-70 years. Total 215 (74%) patients belonged to age group 30-50 years and 74 (26%) patients belonged to age group 51-70 years. In age group 30-50, H. Pylori was found positive in 69 (32.09%) patients and in age group 51-70 years, H. Pylori was found positive in 27 (36.49%) patients. Statistically insignificant association between age group and H. pylori infection was

found with p value 0.567. (Table 1). Male patients were 112 (39%) and female patients were 177 (61%). Total 41 (36.61%) male patients and 55 (31.07%) female patients found with H. pylori infection. Statistically insignificant association between H. pylori and gender was noted with p value 0.370. (Table 2). Total 38 (13%) patients were obese and 251 (87%) patients were non-obese. H. Pylori infection was found in 16 (42.11%) obese patients and in 80 (31.87%) non-obese patients. Association of H. Pylori with obesity was statistically insignificant with p value 0.267. (Table 3). Total 172 (60%) patients belonged to rural area and 117 (40%) patients belonged to urban area. In 75 (43.60%) patients of rural area, H. pylori was found positive. Total 21 (17.95%) patients found with H. pylori infection. Statistically significant association between area of residence and H. pylori was noted with p value 0.000. (Table 4) Duration of symptoms was 1-4 months. Total 152 (53%) patients belonged to 1-2 months duration of symptoms group and 137 (47%) patients belonged to 3-4 months of duration of symptoms. In 1-2 months group, H. Pylori infection was found in 42 (27.63%) patients and in 3-4 months group, H. Pylori infection was found in 54 (39.42%) patients. Statistically significant association of H. Pylori infection with duration of symptoms was noted with p value 0.045. (Table 5)

**Fig. 1:** Frequency of H. Pylori



**Table 1:** Association of H. Pylori infection with age group

Age Group	H. Pylori infection		Total	P value
	Yes	No		
30-50	69 (32.09)	146 (67.91)	215 (74.39)	0.567
51-70	27 (36.49)	47 (63.51)	74 (25.61)	
<b>Total</b>	96 (33.22)	193 (66.78)	289	

**Table 2:** Association of H. Pylori infection with gender

Gender	H. Pylori infection		Total	P value
	Yes	No		
Male	41 (36.61)	71 (63.39)	112 (38.75)	0.370
Female	55 (31.07)	122 (68.93)	177 (61.25)	
<b>Total</b>	96 (33.22)	193 (66.78)	289	

**Table 3:** Association of H. Pylori infection with obesity

Obesity	H. Pylori infection		Total	P value
	Yes	No		
Obese	16 (42.11)	22 (57.89)	38 (13.15)	0.267
Non-obese	80 (31.87)	171 (68.13)	251 (86.85)	
<b>Total</b>	96 (33.22)	193 (66.78)	289	

**Table 4:** Association of H. Pylori infection with area of residence

Area of residence	H. Pylori infection		Total	P value
	Yes	No		
Rural	75 (43.60)	97 (56.40)	172 (59.52)	0.000
Urban	21 (17.95)	96 (82.05)	117 (40.48)	
<b>Total</b>	96 (33.22)	193 (66.78)	289	

**Table 5:** H. Pylori infection with area of residence

Duration of symptoms	H. Pylori infection		Total	P value
	Yes	No		
1-2	42 (27.63)	110 (72.37)	152 (52.60)	0.045
3-4	54 (39.42)	83 (60.58)	137 (47.40)	
<b>Total</b>	96 (33.22)	193 (66.78)	289	

**DISCUSSION**

Approximately, a half of the world population found traumatized with the H. pylori infection; regrettably, 90% of the estimated prevalence in developing countries.<sup>11</sup> It has been observed, in reference with a myriad of epidemiological studies, the significant differences in prevalence across the world; which relies particularly on

socioeconomic conditions like overcrowding, poor sanitation, hygiene and behavior traits of the patient.<sup>12</sup>

Recently many reliable methods for detecting H pylori infection are available. However, since invasive methods require endoscopy, they are not suitable for primary care physicians. In the absence of endoscopy facilities, primary care physicians require non-invasive methods to

diagnose H pylori infection. HpSA stool test is an easy and quick procedure that does not require expensive equipment and can be used as an alternative to detect H pylori infection. This method also offer advantages as a simpler sampling method. The stool test seems to meet the requirements of general practitioners who treat most patients infected with H pylori, because it is easy to perform and requires no blood samples.<sup>13</sup>

The purpose of present study was to determine the Frequency of helicobacter pylori among patients with dyspepsia.

Mean age, weight, height, BMI and duration of symptoms was  $44.11 \pm 10.492$  years,  $54.55 \pm 13.022$  Kg,  $63.63 \pm 4.230$  Inch,  $20.52 \pm 4.524$  and  $2.46 \pm 1.105$  months respectively. Out of 289 patients, H. pylori was found positive in 96 (33%) patients. Male patients were 112 (39%) and female patients were 177 (61%). In one study by Hassan et al,<sup>14</sup> Out of 221 patients included in the study 126(57%) were males and 95(43%) females. Mean age was  $35.33 \pm 11.34$  years. H. pylori stool antigen was positive in 51(25%) patients. Findings of this study are comparable with our study.

In another study by Nafeeza et al<sup>15</sup> done in Malaysia showed overall frequency of H. pylori in 34% of patients with functional dyspepsia with no sex preponderance which is in agreement with our findings.

In a study done in Pakistan frequency of H. pylori in functional dyspepsia patients was 51% which is much higher than our study.<sup>16</sup>

In one study by Niknam,<sup>17</sup> from the 548 included patients (238 males and 310 females), H. pylori was detected in 170 (31.2%). The mean age was  $40.38 \pm 15.39$  years old. H. pylori infection was detected in 26.1% of male and 34.8% of female patients and its prevalence increased with age. Eighty three (48.8%) patients were positive for H. pylori infection, of which, 12.4% had normal and 36.4% had abnormal nonulcerative endoscopic findings; 17.1% of patients were ulcerative and 34.1% had ulcer with or without concurrent abnormality.

In one study by Seid et al,<sup>18</sup> stool antigen test was found positive in 34.4% patients which is comparable with our findings.

Antigen detection rate is comparable with the work of Alimet al.<sup>19</sup> 29.6% and Balan et al.<sup>20</sup> 28.4%. In one study by Buyukbaba-Boral et al<sup>21</sup> done in Turkey, H. Pylori was found positive in 36.6% dyspeptic patients. In Japani and Irani studies, H. Pylori was found positive in 56.4% patients.<sup>22</sup>

The observed variation of infection rate might be attributed to differences in study area, sample size, personal hygienic condition, and the socio-economic status as well as life style of persons contributing for risk of infection. Moreover, the difference in the sensitivity and specificity of employed stool antigen tests may also affect the detection rate of infection. Kibruet al<sup>23</sup> reported frequency of H. Pylori infection in dyspeptic patients as 52.4%. In this study 37% dyspeptic patients were male and 67% patients were female.

In another study,<sup>24</sup> of a total of 230(115 dyspeptic and 115 non-dyspeptic) study participants, overall 112(48.7%) antigens of H. pylori were detected. The prevalence of H. pylori was significantly associated with which gender in both dyspepsia [AOR=2.33, 95% CI: 1.13-5.86],  $p=0.023$  and non-dyspepsia adults [AOR=1.07, 95% CI: 1.01-3.83,  $p=0.035$ ]. Further, the prevalence of H. pylori infection was significantly higher in dyspepsia patients 67/115 (58.3%) than non-dyspepsia 45/115 (39.1%) individuals [AOR=2.4, 95% CI: 1.2-13.7,  $p=0.002$ ].

## CONCLUSION

Results of this study showed a high rate of H. Pylori infection in patients of dyspepsia. Most of the patients belonged to 30-50 years and female patients were more victim of dyspepsia as compared to male. There was insignificant association of H. Pylori infection with age, gender and obesity. But H. Pylori infection was significantly associated with area of residence and duration of symptoms.

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