Seroprevalence of *Helicobacter Pylori* infection among dyspeptic patients of Swat, Khyber Pakhtunkhwa, Pakistan

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ABSTRACT

The *Helicobacter pylori* (*H. pylori*) infection is ubiquitous and infects almost more than half of population of the world that may lead to gastritis, gastric and duodenal ulcer and gastric cancer. Concerning 10% of all infected people develop stomach ulcer, 2-3% develop stomach cancer and less than 0.1% develop another type of gastric tumor called mucosa associated lymphoid tissue (MALT). The present study is about to find the seroprevalance of *H. pylori* among dyspeptic patients and correlation of *H. pylori* positive subjects with their clinical data, signs and symptoms. The study was conducted at Saidu Teaching Hospital Swat, Khyber Pukhtunkhwa, Pakistan and a prospective clinical data interpretation was based on the diagnostic seropositivity tests for *H. pylori*. The inclusion criterion was dyspepsia, based on symptoms and while excluding the dyspeptic patients with antibiotics treatment. A total of 117 subjects were evaluated on a rapid immune chromatography test using Acon test device (Acon labarotories, USA). In the screening study 40 patients were positive for *H. pylori* with prevalence of 34.18%. The predominant signs and symptoms found among positive subjects were abdominal pain, heart burn and vomiting. The prevalence of *H. Pylori* among dyspeptic patients of Swat is low as compared to other parts of Pakistan.

Key Words: *H. pylori,* Gastric Ulcer, Gastric Cancer

INTRODUCTION

Helicobacter pylori are omnipresent and infect both males and females and are present in 75 to 80% of the population worldwide. Infection leads to the development of chronic gastritis and may lead to the development of duodenal and gastric ulcers, gastric adenocarcinoma and lymphoma [1]. Though, in 80–90% of people, these inflammatory reactions are mild and there are no obvious symptoms of infection [2, 3]. More or less 50% of the world's population is affected by gastric *H. pylori* infection. Infection is significantly more prevalent in developing countries where reported prevalence in adult population is around 90% as compared to less than 40% in developed nations [4, 5]. It has been found in a study that Asians carry higher prevalence of *H. pylori* infection and likewise the infection is more frequent in less developed countries like Pakistan, India and Bangladesh, as observed in Japan and China [4, 6]. *H. pylori* commonly causes infection in Pakistan with infection rates reported to be as high as 90%

in adult population while the exposure rate in children is around 33% with infection rates of 67% in infants and 30% in children under fifteen years of age [7, 8]. It has been proposed that the increasing prevalence of *H. pylori* from younger to older subjects reflects the passage through the population of distinct cohorts.

Clinical thought can facilitate the detection of *H. pylori* among patients with dyspeptic symptoms in a geographic area with high prevalence of *H. pylori* infection [9]. Strong evidence for examining cardiac gastric cancer comes from studies in which eradication of *H. pylori* results in high rates (62–100%) of complete regression of the tumors. International Agency for Research on Cancer (IARC) has concluded that *H. pylori* is carcinogenic to humans, causing non-cardiac gastric carcinoma and low-grade B-cell MALT gastric lymphoma [10]. *H. pylori* is believed to be transmitted primarily by fecal–oral or oral–oral routes, with water and food as possible vehicles of infection, while, exact modes of transmission are

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not easily determined, because *H. pylori* is difficult to be cultured from environmental samples [3]. *H. pylori* have been detected in vomits, indicating the potential for gastro–oral transmission [11].

Keeping in view, the high prevalence of *H. pylori* in the region, it was significant to evaluate the dyspepsia patients for screening purpose, since the seropositivity not only warrants the treatment but also determines the pattern of *H. pylori* infection among the subject population.

MATERIALS AND METHODS

The present work is about the seroprevalence of *H. pylori* antibodies in dyspeptic patients and correlation of clinical data, Signs and Symptoms with *H. pylori* positive test results which were carried out in Outdoor Patients Department (OPD) of Saidu Teaching Hospital (STH) Swat, Khyber Pakhtun Khwa.

The study was prospective and analytical based on clinical diagnostic data in correlation with the information obtained in the precise and specific questionnaire, for the subject cases. The questionnaire included address, Gender, Age, clinical history, signs and symptoms and test result of *H. pylori* infection. All the patients were evaluated for symptoms with the help of gastroenterologist by face to face interview and their records were noted in the questionnaire.

A rapid one step immune chromatography test for *H. pylori* was carried out using the Acon device made by USA *Acon* laboratories, a qualitative membrane strip based immunocharacterization, utilizing a combination of *H. pylori* antigen coated particles and anti-human IgG to qualitatively and selectively detect *H. pylori* antibodies in serum or plasma. Sensitivity of the same strip was found as 95% and specificity is 89% [12].

For detection of *H. pylori* antibodies, blood was collected from patients intravenously and serum was obtained by its centrifugation at 3000 rpm for 5 minutes. The 100 µl of serum sample was placed on the test device and after 10-15 minutes, the results were read. The presence of red line in the test region was identified as positive for *H. pylori* antibodies by comparison with positive and negative controls.

RESULTS

Total 117 patients, 48 (41%) males and 69 (59%) females, were evaluated for *H. pylori* antibodies. The age of all patients ranged between 13-70 years with mean 37.41 years. Out of 117 only 40 **(34.18%)** were found positive for *H. pylori* infection, which constituted 22 (45.83%) and 18 (26.08%) males and females respectively.

The positive cases were further interpreted for gender with percentage ratio and female and male resulted 1: 1.75, shown in Figure 1. That makes 26.08% and 45.83% respectively. This ratio indicates that among every 3rd dyspeptic *H. pylori* positive cases, only 1 were female and about 2 were male. It means that males have somehow twice of the seroprevalence for the *H. pylori* infection as observed in females.
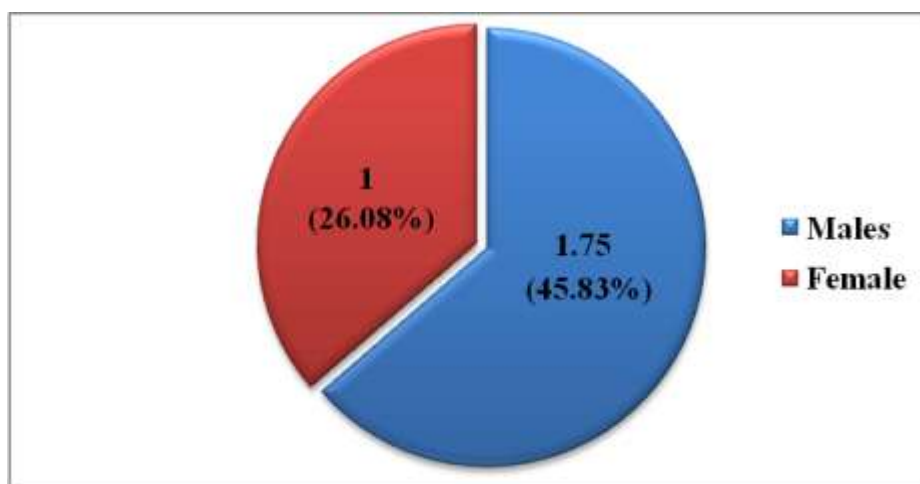

Figure 1. The Gender wise percentage ratio among *H. pylori* positive males and females

The data when analyzed age wise by making interval of ten years, high prevalence was observed in age group 31-40, where 18 (*46.15%*) were positive out of 39. The high prevalence (73.33%) among the male was observed in age group 31-40 while in female had, the high prevalence (50%) within the age group 11-20 (Table 1).

Table 1. Age wise distribution of overall data of male and female patients with *H. pylori* infection

Age groups	Total (n)	+ive	Total %age	Male			Female		
				n	(+)	%	n	+	%
11 - 20	9	2	(22.22)	5	0	(0)	**4**	**2**	**(50)**
21 - 30	27	7	(25.92)	11	3	(27.27)	16	4	(25)
31 - 40	39	**18**	**(46.15)**	**15**	**11**	**(73.33)**	24	7	(29.66)
41 - 50	23	8	(34.78)	7	4	(57.14)	16	4	(25)
51 - 60	16	5	(31.25)	9	4	(44.44)	7	1	(14.28)
61 - 70	3	0	0	1	0	0	2	0	0
Total	117	40	**(34.18%)**	48	22	**(45.83)**	69	18	**(26.08%)**

The signs and symptoms increases with increase in age and were less dominant among male age group 21-30, where abdominal pain, heart burn and nausea were found in 100%, 66.66% and 33.33% patients respectively. Similarly the clinical signs and symptoms were found more dominant among age group 51-60, where abdominal pain, heart burn and nausea were found in all patients while vomiting and headache were found in 75% patients.

There were less frequent symptoms among female with age group 11-20, however abdominal pain and heart burn were found in all these patients. The nausea, vomiting and headache were absent in these particular age groups. In the age group 51-60, where abdominal pain, heart burn, nausea, vomiting and headache were found dominant in all patients (Table 2, 3).

Table 2. The age wise correlation of positive cases with their clinical signs and symptoms among male patients

Age groups	Total +ive	Abdominal pain	Nausea	Vomiting	Headache	Heart burn
11 – 20	Nil	Nil	Nil	Nil	Nil	Nil
21 – 30	3	(100%)	(33.33%)	Nil	Nil	(66.66%)
31 – 40	11	(90.90%)	(54.54%)	(18.18%)	(36.36%)	(72.72%)
41 – 50	4	(100%)	(50%)	(25%)	(50%)	(100%)
51 – 60	4	(100%)	(100%)	(75%)	(75%)	(100%)
Total	22	(95.45%)	(59.09%)	(27.27%)	(40.90%)	(81.81%)

Table 3. Age wise correlation of positive cases with their clinical signs and symptoms among female patients

Age groups	Total +ive	Abdominal pain	Nausea	Vomiting	Headache	Heart burn
11 - 20	2	(100%)	(100%)	Nil	Nil	Nil
21 - 30	4	(100%)	(50%)	Nil	(50%)	(75%)
31 - 40	7	(100%)	(57.14%)	(42.85%)	(71.42%)	(100%)
41 - 50	4	(100%)	(100%)	(75%)	(75%)	(100%)
51 - 60	1	(100%)	(100%)	(100%)	(100%)	(100%)
Total	18	(100%)	(72.22%)	(44.44%)	(61.11%)	(83.33%)

DISCUSSION

Historically the *Helicobacter pylori* infections remained major cause of gastritis, ulcer and stomach cancer. However the majority of peoples are asymptomatic or with varied symptoms. The prevalence of *H. pylori* remains highly variable in relation to geography, ethnicity, age, and socioeconomic factors – high in developing countries and lower in the developed world. The age, ethnicity, gender, geography and socioeconomic status have been found factors that influence the incidence and prevalence of *H. pylori* infection.

The lack of proper sanitation, of safe drinking water, and of basic hygiene, as well as poor diets and overcrowding, all play a role in determining the overall prevalence of infection.

It has been found in a study that Asians carry higher prevalence of *H. pylori* infection and likewise more frequent is occurred in less developed countries like Pakistan, India and Bangladesh, as observed in Japan and China [4-6]. The *H. pylori* infection was observed very common in Pakistan with infection rates reported to be as high as 90% in adult population, while the exposure rate in children approximated 33% and infection rates of 67% in infants14 and 30% in children under fifteen years of age [7, 8].

The overall prevalence of *H. pylori* infection in this study was 34.18%. High prevalence of *H. pylori* was observed in males (45.83%) as compared to female (26.13%). The data were also analyzed age wise and high prevalence (46.15%) was found among the age group 31-40 years. The high prevalence in males (73.33%) was also observed in the group 31-40 while in females (50%) in group 11-20. The predominant symptoms in positive subjects are abdominal pain (97.5%) and heart burn (82.5%). The numbers of Females were more dominant with signs and symptoms among the subject cases for *H. pylori* screening.

Similarly, in a study 165 patients were enrolled, in which 82 were males and 83 females with mean age 41.04 ±15.9 and 35.9 ±11.5 years respectively. The study revealed that males has the heist percentage of 43(52.43%), where females were 38(45.78%) positive for *H. pylori* infection. Slightly higher prevalence has shown in males when compared for gender differences [13].

This prevalence status appear less as compared to other developing countries, as that indicated similar cohorts in Iran, Nigeria and Saudi Arabia with incidence of 71%, 80.4% and 51%, respectively [14-16]. However, there are reports from different parts of the world with lower prevalence of *H. pylori* infection e.g. 27.7% in Srilinka and 23.6% in Turkey [17, 18]. The low prevalence in this study may be attributed to differences in study area, subjects, sample size and ethnicity.

The current prevalence was very low as compared to previous studies conducted in Pakistan as in Islamabad it was found 72.3% and likewise 90% Karachi [7, 19]. Another studies in Pakistan also reported low prevalence of 45% and 40.9% was positive for *H. pylori* [20, 21].

CONCLUSION

The present study reveals that the seroprevalence of *H. pylori* in dyspeptic patients in Pakistan are relatively low. However, the males show high prevalence as compared females and the high prevalence is observed in age group 31-40. The results indicate that dyspeptic patients carry the infection more predominantly but the asymptomatic cases can also be included for the screening purposes over a larger sample size of the population to determine the prevalence of the disease. The surveillance studies consequently shall help to eradicate the infection through effective, preventive and therapeutics measures at the individual and community levels.

ACKNOWLEDGEMENT

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