ORIGINAL ARTICLE

FREQUENCY OF SEROPOSITIVITY OF *HELICOBACTER PYLORI* IN PATIENTS PRESENTING WITH DYSPEPSIA

Farhat Naz, Saqib Malik, Salim Afzal, Syed Abbas Anwar

Department of Medicine, Ayub Medical College, Abbottabad, Pakistan

Background: Dyspepsia is a common health problem and most of the causes of dyspepsia are related to infection by *Helicobacter pylori* (*H. pylori*). Prevalence of *H. pylori* infection is different in different parts of the world. Purpose of our study was to determine the frequency of *H. pylori* infection in patients with dyspepsia in our setting where the prevalence of *H. pylori* was expected to be high. Objective of this study was to determine the frequency of *H. pylori* seropositivity in patients with dyspepsia. **Methods**: A Cross sectional, descriptive study was conducted at the Department of Medicine, Ayub Medical College, Abbottabad from March to September 2009. Patients presenting in Medical outpatient departments of Ayub Teaching Hospital, Abbottabad with dyspepsia were included in the study and interviewed according to Reflux Disease Questionnaire and their serum sent for estimation of anti *H. pylori* IgG antibodies by enzyme linked immunosorbent assay (ELISA). **Results**: A total of 92 patients were included in this study. Out of these 31 (33.7 %) were males and 61 (66.3%) were females. Out of them 68 (73.9%) were found seropositive for *H. pylori* by ELISA. **Conclusion**: *H. pylori* infection is frequent in patients with dyspepsia in our setting and apparently uncomplicated dyspepsia should always be tested for *H. pylori* and all seropositive patients should be offered eradication therapy.

Keywords: Helicobacter pylori (*H. pylori),* dyspepsia, peptic ulcer, gastritis, non-ulcer dyspepsia.

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INTRODUCTION

Dyspepsia is a common health problem encountered worldwide and overall prevalence of dyspepsia is 25%.[1] The diagnosis and management of dyspepsia costs a lot of economic burden worldwide.[2] *H. pylori* is a curved urease producing bacillus which resides in stomachs of almost 50% of people worldwide and is considered responsible for causation of many gastrointestinal diseases including peptic ulcer disease, acute and chronic gastritis, gastric carcinoma and gastric mucosa associated lymphoid tissue (MALT) lymphomas.[1,3] Studies have also shown association between *H. Pylori* infection and Gastro-oesophageal Reflux Disease (GERD),[4] and non ulcer dyspepsia[5,6] but this association is controversial. Nowadays *H. pylori* is considered as the single most important aetiological factor responsible for peptic ulcer disease and 90% of patients with duodenal ulcers and 80% of gastric ulcers are proved to be positive for *H. pylori.*[1] Studies also proved it to be responsible for gastric B cell lymphomas and over 70% patients with mucosa associated lymphoid tumours are positive for *H. pylori.*[7] The incidence of gastric carcinoma also parallels to *H. pylori* infection. The prevalence of *H. pylori* infection differs worldwide. Its prevalence is lower in developed countries and higher in developing countries where 60–70% population is infected with *H. pylori.* This higher prevalence is directly related to poor socioeconomic conditions, overcrowding and poor sanitation.[1]

Most of the population worldwide infected by *H. pylori* belongs to poor socioeconomic class and in settings where all of the facilities for detection of *H. pylori* are not available. So, latest strategies for management of dyspepsia recommend the tests which are cheaper, reliable and easily available.[8]

Many invasive and non-invasive tests are available for determination of *H. pylori* infection and they are comparable in sensitivity and specificity. Invasive tests involve diagnostic endoscopy and include histopathology, culture and rapid urease test. Non-invasive tests include urea breath test, *H. pylori* stool antigen test and *H. pylori* antibody tests. All these tests are highly sensitive and specific and invasive tests are no more considered better than non- invasive tests for determination of *H. pylori.*[9]

Serological tests for *H. pylori* infection have been helpful in epidemiological studies of prevalence. The main advantages of antibody-based tests are their simplicity, low cost, speed, and minimal patient discomfort. *H. pylori* antibody test by enzyme linked immune-sorbent assay (ELISA) in serum has got a high sensitivity and specificity of >90%.[10]

Several guidelines and studies now recommend 'test and treat' strategy for the management of patients with uncomplicated dyspepsia under 55 years of age. *H. pylori* serology by ELISA is recommended as a good diagnostic tool for testing infection by *H. pylori* especially in primary care settings and where other tests are not available.[11]

The purpose of our study was to determine *H. pylori* IgG antibodies by ELISA in patients who presented with dyspepsia in our set-up. In this area prevalence of *H. pylori* in normal population is not

known but being the part of a developing country where socioeconomic conditions and sanitation are not good, it was expected to be high. The determination of frequency of *H. pylori* seropositivity in dyspeptic patients will act as a guide to management strategy for dyspepsia in our setting.

MATERIAL AND METHODS

It was a Cross Sectional study conducted at the Medical A unit of Ayub Medical College, Abbottabad. The study period was six months from April–September 2009. Seropositivity was determined by the detection of *H. pylori* IgG antibodies by ELISA. A value of >1.1u/ml was taken as positive. Dyspepsia was defined as complaints of predominant pain epigastrium of more than one month duration, with or without heartburn.

Ninety-two consecutive patients presenting with dyspepsia were included in the study. All new and 'follow-up' patients who attended wards and outpatient departments were screened for symptoms suggestive of dyspepsia and were interviewed. Both genders, 15–55 years of age with dyspepsia of more than four weeks were included in the study.

A detailed drug history was taken and the patients were carefully interviewed. Patients on non-steroidal anti-inflammatory drugs (NSAID's) and steroids for any indication, antidepressants, anticoagulants, antibiotics, and other drugs causing dyspepsia were excluded. Patients with history of usage of proton pump inhibitors or H_2 blockers or bismuth compounds in last two weeks were also excluded as these drugs have some anti *H. pylori* activity and could affect the results.

After careful selection, informed consent were sought. Confidentiality of data was assured and ensured. Personal details of the patients like name, age, gender, monthly income in rupees, height and weight were recorded. The nature of the dyspepsia was assessed by determining the most predominant symptoms experienced by the patients. This involved the researcher interviewing the patients and asking them what they considered to be their most troublesome and frequent symptoms (i.e., heartburn, regurgitation, epigastric pain or epigastric burning). Detailed history regarding patient symptoms frequency and severity was recorded according to Reflux Disease Questionnaire (RDQ). RDQ is a self-administered questionnaire, in which subjects are asked to report on the frequency and severity of the following symptoms over the past four weeks: 1. Heartburn, 2. Regurgitation, 3. Epigastric pain, 4. Epigastric burning.

Symptom frequency was ranked according to the following six choices in RDQ: 1. Did not have 2. <1 day a week, 3.1 day a week, 4. 2–3 days a week, 5. 4–6 days a week, 6. Daily.

Symptoms severity was also ranked according to following six choices: 1. Did not have, 2. Very mild (awareness of sign or symptom), 3. Mild (awareness of sign or symptom, but easily tolerated), 4. Moderate (discomfort sufficient to cause interference with normal activities), 5. Moderately severe (discomfort causing difficulty to perform normal activities), 6. Severe (incapacitating with ability to perform normal activities). Data were analysed using SPSS-10. Chi-square test was used to compare the frequencies of *H. pylori* seropoitivity in different sex groups, ages and BMI. Value of $p \leq 0.05$ was taken as significant.

RESULTS

Total 92 patients were included in the study and 68 (73.9%) were found *H. pylori* positive. Among 92 patients, 61 (66.3%) were females and 31 (33.7%) were males. Among 61 females 42 (68.8%) were *H. pylori* positive and among 31 males 26(83.8%) were *H. pylori* positive (Table-1).

Age of the patients ranged from 15–55 years (Mean 35.39±11.21 years SD). Among 92 patients, 29 (31.5%) had ages between 15–30 years, 37 (40.2%) patients had ages between 31–45 years and 26 (28.3%) patients had ages between 46–55 years. Twenty out of 29 (68.8%) in 15–30 years age group, 27 out of 37 (72.9%) in 31–45 years age group and 21 out of 26 (80.7%) in 46–55 years age group were found *H. pylori* positive.

Body Mass Index (BMI) ranged from 17.3 to 28.39 (Mean 22.15±2.76SD). Among 92 patients, 22 (23.9%) patients had low BMI of <20, 52 (56.5%) patients had normal BMI of 20–25 and 18 (19.6%) patients were obese with BMI of >30. 17 out of 22 (77.2%) patients with low BMI, 38 out of 52 (73%) patients with normal BMI and 13 out of 18(72.2%) overweight patients were *H. pylori* positive.

Among 92 patients 16 (17.4%) had monthly income <10,000 rupees and 14 out of 16 (87.5%) were *H. pylori* positive. Twenty-four (47.8%) patients had income of 10,000–20,000 and 32 out of 44 (72.7%) were H. *pylori* positive and 32 (34.8%) patients had monthly income of >20,000 and 22 out of 32 (68.7%) were *H. pylori* positive. Patients' symptoms frequency and their severity are given in Table-2 and Table-3 respectively.

Table-1: Age and gender distribution of patients according to *H. pylori* sero-positivity (n=92)

	Helicobacter Pylori +ve n (%)	**Helicobacter Pylori -ve** n (%)
Age		
15–30	20 (21.7)	9 (9.78)
31–45	27 (29.3)	10 (10.8)
46–55	21 (22.8)	5 (5.4)
Gender		
Male	26 (28.3)	5 (5.4)
Female	42 (45.6)	19 (20.6)

Table-2: Distribution of patients according to symptoms frequency

	Heartburn	Regurgitation	Epigastric Pain	Epigastric Burning
None	31 (33.7)	15 (16.3)	0	0
<1 day a week	23 (25)	22 (23.9)	2 (2.2)	0
1 day a week	14 (15.2)	24 (26.1)	10 (10.8)	10 (10.8)
2–3 days a week	14 (15.2)	25 (27.2)	34 (37)	34 (37)
4–6 days a week	5 (5.4)	1 (1.1)	27 (29.3)	16 (17.4)
Daily	5 (5.4)	5 (5.4)	19 (20.7)	32 (34.8)

Table-3: Distribution of patients according to symptoms severity

	Heartburn	Regurgitation	Epigastric pain	Epigastric burning
None	28 (30.4)	16 (17.4)	0	0
Very mild	30 (32.6)	22 (23.9)	2 (2.2)	0
Mild	16 (17.4)	32 (34.8)	6 (6.5)	9 (9.8)
Moderate	10 (10.9)	17 (18.5)	29 (31.5)	32 (34.8)
Moderately severe	5 (5.4)	3 (3.3)	41 (44.6)	29 (31.5)
Severe	3 (3.3)	2 (2.2)	14 (15.2)	22 (23.9)

DISCUSSION

Since *H. Pylori* was first cultured by Warren and Marshall in 1983, much has been learned about its clinical aspects and its epidemiology. Knowledge of the epidemiology of this infection comes mainly from prevalence studies. Investigation of the incidence of *H. pylori* infection has been limited due to difficulties in identifying the case at the onset. In general *H. pylori* infection is more frequent in developing countries than in developed nations. There is high prevalence of *H. Pylori* in low socioeconomic strata and studies have estimated a prevalence of 80–90% in the developing world in patients with symptoms of dyspepsia. Most of the patients visiting Ayub Teaching Hospital belong to low socioeconomic group so it was expected that many of these patients of dyspepsia would be harbouring *H. pylori*.

Overall 92 patients with complaints of dyspepsia were included in the study. Out of these 92 patients 73.9% were found *H. pylori* positive and 26.1% were found *H. pylori* negative. Among total 92 patients, 33.7% were males and 66.3% were females. This figure shows a sex difference in study group, female patients being more than males. This could be a matter of chance that more female patients visited for management of dyspepsia during the study period. The frequency of *H. pylori* infection was found higher in males compared to females but this difference was not statistically significant (p=0.12). Similar observation was made in the study of Replogle *et al* which showed a sex difference, higher in men, in the prevalence of infection.[14] While in study done by Shiota *et al* in Japan, higher prevalence of infection was found in females.[15]

In our study a higher frequency of *H. pylori* infection was found with increasing age but this difference was not statistically significant (p=0.17). This finding matched with findings of the study of Santos *et al* in Brazil where they found increasing infection frequency with increasing age, they concluded that the prevalence increased with age and in their study this age difference was statistically significant.[16] The similar age related trends were also described by Rowland *et al*.[17] Conversely in study by Marusić *et al*, it was found that sero-prevalence of *H. pylori* was not age dependant.[18]

In our study, *H. pylori* sero-positivity was found higher in patients with low BMI compared to patients with normal BMI and overweight patients, but no statistically significant relation was found (p=0.38). A study by Sood *et al*. revealed that growth in children infected by *H. pylori* was impaired as compared to controls and they had lower BMI.[19]

Patients were divided into three groups according to monthly income in rupees to get an idea of their economic status. As the association of *H. pylori* infection with socio-economic status was not the main interest of our study, we did not record all the details to assess the socio-economic status and just divided patients according to monthly income in three groups. It was noted that *H. pylori* seropositivity was higher in low income group (87.5%) as compared to middle income (72.7%) and high income group (68.7%). Similar observation was made by Santos et al. in their population based study on *H. pylori* and associated factors and found that *H. pylori* infection was directly related to low monthly income.[16]

Symptoms frequency and severity were recorded according to Reflux Disease Questionnaire. While evaluating the symptoms frequency, we found that heartburn and regurgitation were not very frequent complaints and most of the patients who had these complaints, did not have them for more than two or three days a week. The most frequent complaints were epigastric pain and epigastric burning. >20% patients complained of epigastric pain daily and 34.8% patients complained of epigastric burning daily.

Severity of heartburn and reflux was not a major concern in most of the patients and very few patients had moderately severe to severe heartburn and reflux symptoms. Severity of epigastric pain and epigastric burning was the major concern of the patients in our study. 44.6% patients had moderately severe and 15.2% patients had severe epigastric pain. Similarly 31.5% and 23.9% patients had moderately severe and severe epigastric burning.

In our study on frequency of *H. pylori* seropositivity in dyspeptic patients, 73.9% were found positive for *H. pylori*. Similar types of studies were performed by other researchers in Pakistan and other countries but the results were variable in different parts of the world.

Riaz ul Hassan and Abbas conducted their study in Karachi on 100 patients with dyspepsia; the

overall frequency of *H. pylori* among dyspeptic patients in their study was 73%.[6] Their study was based on detection of *H. pylori* infection by endoscopic methods including histopathology and rapid urease test. The frequency of *H. pylori* in their study is closer to frequency of *H. pylori* found in our study.

Malik *et al* studied prevalence of *H. pylori* in dyspeptic patients at Liyari General Hospital Karachi on 63 patients. The detection of *H. pylori* in their study was also endoscopy based, but they found 47.62% dyspeptic patients positive for *H. pylori*.[20] The frequency of *H. pylori* determined by Malik *et al* is much lower compared to our study and the study done by Riaz ul Hassan *et al*. One of the reasons is their detection of *H. pylori* was based only on histology, which is a very specific and sensitive test for *H. pylori* but could miss some of positive cases if biopsy sample is not taken properly.

Amin *et al* studied 100 patients with dyspepsia in Faisalabad. Their endoscopy based study included histology and rapid urease test for detection of *H. pylori* and found 65% patients positive for *H. pylori*.[21]

Fareed *et al* did endoscopic study on 150 dyspeptic patients at Jinnah Postgraduate Medical Centre, Karachi and compared *H. pylori* density in biopsies taken from different parts of the stomach and found that 82.7% of antral, 74% of corpus and 68% of cardia biopsies were positive for *H. pylori*.[22] This study reveals that diagnostic accuracy of *H. pylori* infection by histology is dependent on the site from where biopsy is taken.

Mohsin *et al* conducted study on 78 dyspeptic patients at Jinnah Hospital Lahore and performed endoscopic biopsies and histology for detection of *H. pylori*, and they found 43.6% patients positive by histology.[23]

Wadood *et al* did endoscopic study on 105 dyspeptic patients in Quetta and found 59% patients positive for *H. pylori* on histology.[24]

Another study on determination of *H. pylori* infection in dyspeptic patients was done by Qureshi *et al* in Jamshoro on 80 patients of which 90% were found positive for *H. pylori*.[25] Their study also involved diagnostic endoscopy and detection of *H. pylori* by rapid urease test and histology. Their frequency was much higher compared to frequency of *H. pylori* in our study. One of the important reasons could be that the study was carried out at a time when prevalence of infection was higher all over the world. In Iran, a study on 1000 dyspeptic patients was conducted by Hashemi *et al* from 1999 to 2005. They determined *H. pylori* infection by histology and rapid urease test and found 67.1% patients positive for *H. pylori.*[26]

Sari *et al* determined *H. pylori* infection in 9239 patients over 10 years period in Turkey. Diagnosis of *H. pylori* infection was done by CLO test performed on endoscopy and they found a prevalence of 61.53% during first five years and 38.47% during second five years period.[27] This study shows that prevalence of infection in dyspeptic patients is decreasing with time as the socioeconomic conditions are improving and knowledge regarding the diagnosis and treatment of infection is increasing.

Akber *et al* studied 491 patients with dyspepsia in Saudi Arabia. *H. pylori* status was evaluated by three biopsy-based methods (rapid urease, histology, and culture), and by ELISA. *H. pylori* was detected in 70% of 491 patients examined by histology, 59% by rapid urease test, whereas 78% were sero-positive for *H. pylori* immune-globulins by ELISA.[28]

Shiota *et al* studied 258 dyspeptic patients in Japan and the status of *H. pylori* was determined by measuring urinary levels of anti *H. pylori* antibody. They found 47.8% prevalence in dyspeptic patients. This prevalence of 47.8% is much lower compared to our study and it again could be related to better socio economic conditions in Japan.[15]

Another study was done by Abdul Aziz *et al*, in an urban area of Malaysia. Prevalence of *H. pylori* on dyspeptic patients was determined by urea breath test and they found only 23.5% patient's positive for *H. pylori*.[29] This is in contrast to our study and it could be due to recent development and improved socioeconomic conditions in Malaysia.

Nigeria is known to have high prevalence of *H. Pylori* infection. The study of dyspeptic patients based on endoscopic diagnosis of *H. pylori* done by Lawal *et al* revealed 77.5% prevalence in patients with dyspepsia. This figure is not high when compared to our frequency of 73.9%.[30]

Chong *et al* studied prevalence of *H. pylori* infections in patients referred for endoscopy in Brunei Darussalam. They found 29.8% prevalence of *H. pylori* in patients with dyspepsia. They also found that Malays and Chinese have lowest prevalence of *H. pylori*.[31]

Studies in the Republic of Georgia, a developing country with an economy in transition, suggested that >70% of adults were infected with *H. pylori*. Study done by Tarkhashvili *et al*, in the Republic of Georgia on patients referred for endoscopy, *H. pylori* was found positive in 72% of patients with dyspepsia.[32] The main difference in their study and our study was that their study was endoscopy based and involved invasive methods for diagnosis and most of the patients were over 60 years of age. Another study done on dyspeptic patients in Georgia by Olivares *et al*, had also shown a prevalence of 72.7%.[33]

Marusić *et al* studied the sero-prevalence of *H. pylori* among dyspeptic patients in Croatia and found 92.3% prevalence by ELISA.[18] This percentage is much higher compared to frequency of *H. pylori* in dyspeptic patients in our study. This could again be related to

geographical variation of the prevalence of infection and socioeconomic conditions.

Santos *et al* showed a prevalence of 63.4% in overall population and this prevalence was 22% higher in patients having symptoms of dyspepsia as compared to asymptomatic individuals (p=0.01). They showed that though *H. pylori* infection was common in Brazil its association with dyspepsia was significant.[16]

CONCLUSION

H. pylori infection is frequent in patients with dyspepsia and apparently uncomplicated dyspepsia should always be tested for *H. pylori* and all sero-positive patients should be offered eradication therapy.

REFERENCES

1. Valle JD. Peptic ulcer disease and related disorders. In: Fauci S, Braunwald E, Kasper L, Hauser SL, Longo L, Jameson JL, *et al* editors. Harrison's principles of internal medicine. 17th ed. New York: McGraw-Hill's; 2008. p.1855–72.
2. Lane JA, Murray LJ, Nobel S, Egger M, Harvay IM, Donovan JL, *et al*. Impact of Helicobacter pylori eradication on dyspepsia, health resource use, and quality of life in the Bristol helicobacter project: randomized controlled trial. BMJ 2006;332:199–204
3. Kuipers EJ, Blaser MJ. Acid peptic disease: Epidemiology and pathobiology. In: Goldman L, Ausiello D, editors. Cecil Medicine. 23rd ed. Philadelphia: Elsevier, 2007; p. 994–8.
4. Grande M, Cadeddu F, Villa M, Attina GM, Muzi MG, Nigro C, *et al*. Helicobacter pylori and gastroesophageal reflux disease. World J Surg Oncol 2008;6:74–8.
5. Khan MQ. Helicobacter pylori Eradication Therapy in Nonulcer Dyspepsia is Beneficial. Saudi J Gastroenterol 2008;14:96–100.
6. Riazul-Hassan S, Abbas Z. Presence of Helicobacter pylori in dyspeptic patients with endoscopically normal stomach. Pak J Med Sci 2007;23 335–9.
7. Todorovic M, Balint B, Jevtic M, Suvajdzic N, Ceric A, Stamatovic D, *et al*. Primary gastric mucosa associated lymphoid tissue lymphoma: Clinical data predicted treatment outcome. World J Gastroenterol 2008;14:2388–93.
8. Lassen A, Hallas J, Schaffalitzky de Muckadell OB. *Helicobacter pylori* test and eradicate versus prompt endoscopy for management of dyspeptic patients: 6.7 year follow up of a randomised trial. Gut 2004;53:1758–63.
9. Mégraud F, Lehours P. Helicobacter pylori detection and antimicrobial susceptibility testing. Clin Microbiol Rev 2007;20:280–322.
10. Leal YA, Flores LL, García-Cortés LB, Cedillo-Rivera R, Torres J. Antibody-based detection tests for the diagnosis of helicobacter pylori infection in children: a meta-analysis PLoS ONE 2008;3:3751–6.
11. Musana AK, Yale SH, Lang KA.. Managing dyspepsia in a primary care setting. Clin Med Res 2006;4:337–42.
12. Shaw M[1], Dent J, Beebe T, Junghard O, Wiklund I, Lind T, , *et al*. The reflux disease questionnaire; a measure of treatment response in clinical trials. Health Qual Life Outcomes 2008;6:31–2.
13. Lacy BE, Rosemore J. Helicobacter pylori: ulcers and more: The beginning of an era. J Nutr 2001;131:2789S–93.
14. Replogle ML, Glaser SL, Hiatt RA, Parsonnet J. Biological sex as a risk factor for Helicobacter pylori infection in healthy young adults. Am J Epidemiol 1995;142:856–63.
15. Shiota S, Murakami K, Takayama A, Yasaka S, Okimoto T, Yoshiiwa A, *et al*. Evaluation of Helicobacter pylori status and endoscopic findings among new outpatients with dyspepsia in Japan. J Gastroenterol 2009;44:930–4.
16. Santos IS, Boccio J, Santos AS, Valle NC, Halal CS, Bachilli MC, *et al*. Prevalence of *Helicobacter pylori* infection and associated factors among adults in Southern Brazil: a population-based cross-sectional study. BMC Public Health 2005;5:118.
17. Rowland M, Daly l, Vaughan M, Higgins A, Bourke B, Drumm B. Age-specific incidence of Helicobacter pylori. Gastroenterology 2006;130:65–72.
18. Marusic M, Presecki V, Katicic M, Bilic A, Jurcic D, Schwarz D. Seroprevalence of Helicobacter pylori infection in dyspeptic patients. Coll Antropol 2008;32:1149–53.
19. Sood MR, Joshi S, Akobeng AK, Mitchell J, Thomas AG., Thomas A. Growth in children with Helicobacter pylori infection and dyspepsia. Arch Dis Child 2005;90:1025–8.
20. Malik KA, Shaikh R, Rehman S. Prevalence of Helicobacter Pylori in dyspeptic patients at Liyari General Hospital. Pak J Surg 2007;23:33–5.
21. Amin K, Alam Z, Nagra MH, Hussain I, Javed M. Helicobacter pylori with non-ulcer dyspepsia. Professional Med J 2003;10:208–11.
22. Fareed R, Abbas Z, Shah MA. Effect of Helicobacter pylori density on inflammatory activity in stomach. J Pak Med Assoc 2000;50:148–51.
23. Mohsin A, Qayyum A, Hussain I, Mirza A, Shah AA, Zaidi SNR. Helicobacter Pylori Prevalence and Eradication (HAPPEN) Study: Helicobacter Pylori Prevalence: An experience with patients presenting to Jinnah Hospital, Lahore. Ann King Edward Med Coll 1999;5:95–6.
24. Wadood A, Aziz ur Rehman, Masud U, Mirza JA, Sahibzada NJ, Aziz ur Rehman. Helicobacter associated Gastritis a clinic-pathological study at Quetta. Biomedica 1997;13:57–9.
25. Qureshi AF, Memon AS, Memon MA, Memon JM, Soomro AA, Shaikh MK. Incidence of Helicobacter Pylori in Gastroduodenitis. Biomedica 1996;12(1):19–21.
26. Hashemi MR, Rahnavardi M, Bikdeli B, Dehghani Zahedani M. *H. pylori* infection among 1000 southern Iranian dyspeptic patients. World J Gastroenterol 2006;12:5479–82.
27. Sari YS, Sander E, Erkan E, Tunali V. Endoscopic diagnosis and CLO test results in 9239 cases, prevalence of Helicobacter pylori in Istanbul, Turkey. J Gastroenterol Hepatol 2007;22:1706–11.
28. Akbar DH, Eltahawy AT. Helicobacter pylori infection at a university hospital in Saudi Arabia: prevalence, comparison of diagnostic modalities and endoscopic findings. Indian J Pathol Microbiol 2005;48:181–5.
29. Abdul Aziz AF, Hamzah Z, Tong SF, Nadeson S,Wan Puteh SE. Helicobacter pylori related dyspepsia: prevalence and treatment outcomes at University Kebangsaan Malaysia-Primary Care Centre. Asia Pac Fam Med 2009;8:4–7.
30. Lawal OO, Rotimi O, Okeke I. Helicobacter pylori in gastroduodenal diseases. J Natil Med Assoc 2007;99:31–4.
31. Chong VH, Lim KC, Rajendran N. Prevalence of active *Helicobacter pylori* infection among patients referred for endoscopy in Brunei Darussalam. Singapore Med J 2008;49:42–6.
32. Tarkhashvili N, Beriashvili R, Chakvetadze N, Moistsrapishvili M, Chokheli M, Sikharulidze M, *et al*. Helicobacter pylori Infection in Patients Undergoing Upper Endoscopy, Republic of Georgia. Emerg Infect Dis 2009;15:504–5.
33. Olivares A, Buadze M, Kutubidze T, Lobjanidze M, Labauri L, Kutubidze R, *et al*. Prevalence of Helicobacter pylori in Georgian patients with dyspepsia. Helicobacter 2006;11:81–5.

Address for Correspondence:

Dr. Farhat Naz, Department of Medicine, Ayub Teaching Hospital, Abbottabad, Pakistan. **Cell:** +92-331-5744594

Email: drfarhat_med10@yahoo.com