H. pylori infection among hospital attending dyspeptic patients in Kathmandu, Nepal

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ABSTRACT

INTRODUCTION: H.pylori infection is a primary etiological factor in gastritis, duodenal and gastric ulcers, and non-ulcer dyspepsia. This study was done to find out the magnitude of H. pylori infection among the hospitals attending dyspeptic patients in Kathmandu.

METHODS: Total of 302 symptomatic patients of dyspepsia of more than 3 months duration who had never received triple therapy (h.pylori eradication therapy) in past were taken as a study group. Rapid urease test by using urease test kits was applied on endoscopically taken antral biopsy samples from all the patients.

RESULT: H.pylori infections among the dyspeptic patients who attended the two tertiary level hospitals in Nepal was found to be 39.1%. H.pylori in Non ulcer dyspeptic patients (42.6%) was found to be more than that of the Ulcerative dyspeptic patients (22.6%) with p=0.007. Urease positives were 2.53 (95% CI, 1.27, 5.05) times more likely among Non ulcer dyspeptic patients as compared to Ulcerative dyspeptic patients. Endoscopically, the Antral gastritis and Erosive gastritis correlated more with the positive urease test results 29.75% and 40.7% respectively, than the Gastric ulcer (5.9%) or Duodenal ulcer (4.2%) or any other endoscopic findings with p-value of =0.005.

CONCLUSION: H.pylori infection among hospital attending dyspeptic patients in Kathmandu was found to be 39.1%.

KEY WORDS: Dyspepsia,h.pylori infection,UD-Ulcerdyspepsia,NUD-Nonulcer dyspepsia

INTRODUCTION

According to Rome I criteria, dyspepsia is chronic and recurrent pain or discomfort centered in the epigastrium. The most common cause of dyspepsia is functional dyspepsia which is also called idiopathic dyspepsia. Functional dyspepsia is diagnosed when no structural or biochemical explanation for a patient's symptoms is identified after appropriate investigations.[1] Helicobacter pylori is the most common infectious disease worldwide may be found in up to 50% of the world's population.[2]In some developing countries the prevalence is as high as 80–90%, whereas in the U.S.,35–40% of the population is infected.[2]Surprisingly, most people infected with H. pylori are asymptomatic, which suggests that additional factors are necessary for the development of H. pylori–associated diseases.[2]The major risk factors for the development of H. pylori include a low socioeconomic status crowded living conditions (especially during childhood), poor sanitation and poor hygiene. Most infections appear to occur early in life, and the rates of infection between men and women are similar.[2]An oral-oral route of transmission is supported by studies demonstrating increased transmission in chronic care facilities and in institutionalized individuals.[2]However; some researchers believe that H. pylori may also spread by a fecal-oral route. The annual incidence reported in 3 adult studies in developed countries was between

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0.3% and 0.5% per year.[3] Prevalence estimates vary greatly, depending on the location of the study group and the characteristics of the population studied. In general, prevalence increases with age and correlates positively with a low socioeconomic status during childhood.[4] Low socioeconomic factors namely lack of education, poverty, overcrowding, poor sanitation and unsafe water supplies are high risk factors.

Diagnosis of H.pylori infection: Six methods are now routinely used to diagnose H. pylori infection.[2]The first method is serology i.e., enzyme-linked immunosorbent assay to check for IgG antibodies, test is inexpensive, and sensitivity and specificity are estimated to be 80–90%.[2] The second method is pH indicator tests. These are performed at the time of upper endoscopy,test strips are used to (e.g., CLO test, PyloriTek, Hpfast) check for the presence of urease. Sensitivity and specificity are high (95–98%).[2]The third method is histology, biopsies are taken from the antrum and usually from the fundus as well.[2] The presence of a chronic active gastritis strongly suggests infection, while the absence of chronic active gastritis virtually excludes infection.[2] Various stains can be used (hemotoxylin and eosin, Giemsa, Warthin-Starry) to identify H. pylori. Sensitivity and specificity are high (95% range).[2] Fourth method is tissue culture, Biopsy samples are cultured and determination of antibiotic resistance.[2] Fifth method is breath test.Patients are given a small amount of radioactively labeled carbon (^{13}C or ^{14}C) coupled to urea.[2] The urease breaks down the urea, producing radioactive bicarbonate.[3] This is absorbed through the gastric mucosa and then broken down into $^{13}CO_2$ or $^{14}CO_2$, which can be measured as the patient breathes into a bag.[2] The sensitivity and specificity are high (>95%), while the cost is moderate.[2] Sixth method is stool antigen test, which is accurate (80 - 94% specificity and sensitivity) and reasonably priced.[2]

Generally, two tests are recommended by many researchers to diagnose H.pylori infection. I chose only one test in this study which is an urease test on biopsy samples because the test is well validated tool by researchers in several past studies .It has very high sensitivity and specificity ,i.e.,95-98%.Secondly, it is inexpensive and easy to perform test even by assistants working in the endoscopy department.On top of endoscopy and urease test addition of another test could have made the study too expensive to conduct among poor patients and unfunded study. The drawbacks of other tests as stated below too stopped me to use two tests to in the study. Serology cannot differentiate between a current infection or previous exposure.[2] After treatment and eradication, antibody levels remain positive for years, although titers may drop by 50% at 12 month.[2] Histology is expensive, although the cost of the endoscopy makes this further expensive test.[2]culture-is reserved for those patients who have been treated for H. pylori infection in the past but have had a recurrence.[2]and is a cumbersome and expensive process.[2]Breath test is best used to determine H. pylori eradication after treatment.[2] Stool antigen test are new and has not became commercially available everywhere.[2]

METHOD

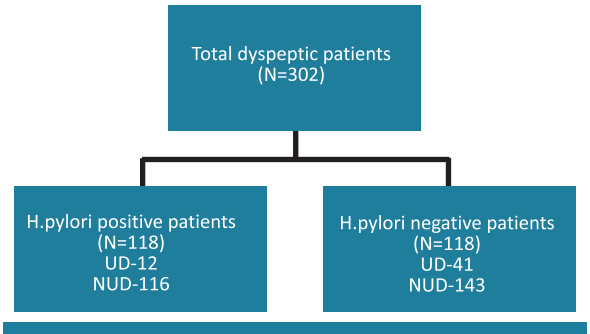
This was a cross sectional hospital based observational study. Data were collected from December 2009 to January 2011.A total of 302 symptomatic cases of dyspepsia of more than 3 months duration were chosen to include in the study. All were having no history of intake of triple therapy for H.pylori eradication in past. They were also had no history of intake of antacid, non steroidal anti inflammatory drugs,proton pump inhibitors,Bismuth or Antibiotic use during past 2 week periods.107 case were enrolled at gastroenterology department of Bir hospital where as 195 cases were enrolled at gastroscopy department of Shree Birendra army hospital at chhauni, Kathmandu, Nepal .History taking and physical examinations were done to find out relevant data. Pre medications with xylocaine 2% oral gurgle were done prior to Upper gastrointestinal endoscopy.Punch biopsies from their antrum were done endoscopically.Urease test kit stored in freeze inside brought to room temperature 30 min prior to the testing. The results of urease tests were interpreted within 30 min of contact period of biopsied samples. If it turned red the result noted as positive otherwise the the test were noted negative. All who tested positive were prescribed triple therapy for H.pylori eradication for 14 days as per the study guidelines. All were prescribed Capsule, Amoxicillin 1 gm twice daily, Tablet, Clarythromycin 500 mg twice daily and Tablet, Pantoprazole 40 mg twice daily. Those who tested negative for urease test were prescribed Tablet, Pantoprazole 40 mg or Capsule, Omeprazole 20 mg twice daily for 2 weeks.

Sample Size calculation-N= (Z_a^2) (P) (Q)/d^2,

Where, N=required sample size, Za=z variate corresponding to desired reliability level (1.96 for 95% reliability) P=estimated proportion in the population, Q=100-P (if P is in %), d=maximum tolerable error=10% of P

Most of the study estimates have found that H. pylori infection ranges in developing world like ours from 70-90%. So, the value of P here is 70%, Q=30%, d=10% of P.Then calculation for the sample size was as follow-(1.96)2.70.30/ $(7)^2$=164.An estimated 300 cases were the desired sample size to draw a valid conclusion. Data were analyzed by using SPSS 17.0 and Microsoft Excel 2007 for windows. Clinical presentation in terms of number of patients with each symptom in H. pylori positive and H. pylori negative group were compared using chi-square test, chi square (exact) test. Binary logistic regression was used to calculate Odds ratio of positive urease test among Non ulcer dyspepsia as compared to Ulcer dyspepsia. P value <0.05 considered as significant.

RESULTS



UD-Ulcer dyspepsia,NUD-Non ulcer dyspepsia

Flow chart showing the dyspeptic patients and H.pylori results. (Flow Chart-1) P=0.007.

Non-ulcer dyspeptic patients were found to be more H.pylori urease test positive than the Ulcer dyspeptic patients. This is a statistically significant result. Urease positives are 2.53 (95% CI, 1.27, 5.05) times more likely among Non ulcer dyspepsia as compared to Ulcer dyspepsia.

Table-1.UGI endoscopic findings and H.pylori Urease test results

Endoscopic findings	Urease Negative	Urease Positive	Total
Gastric Ulcer	28(80.0%)	7(20.0%)	35(100.0%)
Duodenal Ulcer	12(70.6%)	5(29.4%)	17(100.0%)
Both	1(100.0%)	0(.0%)	1(100.0%)
Antral gastritis	29(45.3%)	35(54.7%)	64(100.0%)
Erosive gastritis	61(56.0%)	48(44.0%)	109(100.0%)
Others (Normal/ Varices/ Hiatus hernia)	53(69.7%)	23(30.3%)	76(100.0%)
Total	184(60.9%)	118(39.1%)	302(100.0%)

P=0.005.Antral gastritis and erosive gastritis were associated with high percentages of H.pylori positive urease test results. This was statistically significant results.

DISCUSSION

Nepal is a country presumed to have one of the highest prevalence of H.pylori infection because of the poor socioeconomic status. Since H.pylori was first cultured by Warren and Marshall in 1983, much has been learned about its clinical aspects and its epidemiology. In general H.pylori infection is more frequent in developing countries than in developed nations. In developed countries, H.pylori infection is acquired at fairly constant rate of 2–6% per year with prevalence 20–40% in adults.[5] The study done in Malaysia which is also one of the developing countries like Nepal, the data showed that the prevalence of H.pylori infection varies widely from 11 to 70% with an average of 35 to 40%. The highest rate was seen among the indigenous natives (54 to 65.3%) in east coast of Sabah, East Malaysia.[6]

In the present study, H.pylori infection among the dyspeptic patients was found to be 39.1%. H.pylori in Non ulcer dyspeptic patients (42.6%) was more than that of the Ulcerative dyspeptic patients (22.6%).Non ulcer dyspeptic patients showed more positive results i.e., 42.6% than the Ulcerative dyspeptic patients i.e.,

22.6%. Though results are very similar to the previous studies done in Nepal, magnitude of H.pylori infection was expected at the start of the study to be much more than the observed. The universality of Proton pump inhibitor, antacid and other over the counter drugs use might have influenced the results. It seemed patients might have difficulty recalling the past 2 weeks drug intake which might also have influenced the urease test results. Similarly, the result might have been influenced by the non uniform techniques of biopsy taking by different endoscopists and the thickness of the biopsy material taken from below mucosa. It was also noted that antral punch biopsy if taken from a Ulcerative dyspeptic patient found mostly negative.[7]This might be because of transmigration of H.pylori bacterium to the fundus of the stomach in chronic atrophic gastritis and the Ulcerative dyspeptic patients. Another explanation of lower rate of H.pylori infection in ulcerative dyspeptic patients than the Non ulcerative patients might be due to a low sample size of Ulcerative dyspeptic patients. However, a study done in Dolpa district of Nepal also favors that there might be decreasing prevalence of the H.pylori infection in Nepal.[8] Similar study done in China suggested that the seroprevalence of H. pylori infection has significantly decreased during the 10-year period in Guangzhou. This change may be attributable to the improvement in socioeconomic conditions in this city.[9]

LIMITATIONS:

Firstly, the sampling error occurred due to disproportionate sample size in Ulcer and Non Ulcer dyspeptic patients and a recall bias of the patients about the use of any drugs like Proton pump inhibitors or antibiotics or Antacids 2 weeks prior to the test which affected the urease result. Secondly, the errors of taking biopsy from the sub mucosal tissue might also have occurred.

CONCLUSION:

H.pylori infection among the hospital attending dyspeptic patients in the tertiary level hospitals in Kathmandu,Nepal was found to be 39.1%.H.pylori in Non ulcer dyspeptic patients (42.6%) was found more than that of the Ulcerative dyspeptic patients (22.6%) with a p=0.007.Antral gastritis (29.75%) and Erosive gastritis (40.7%) were found with more positive urease test results than the Gastric ulcer (5.9%) or Duodenal ulcer (4.2%) or any other endoscopic findings. The results were statistically significant with P=0.005.

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