SPECTRUM OF HELICOBACTER PYLORI IN HUNDRED PATIENTS PRESENTING WITH PERFORATED DUODENAL ULCER

Iqbal Haider[1], Dildar Hussain[2], Ali Mohammad[3]

ABSTRACT

***Objective**: To find out the frequency of Helicobacter pylori in patients presenting with perforated duodenal ulcer.*

***Methodology**: This observational study was conducted at Lady Reading Hospital Peshawar from July 2004 to January 2005 on 100 patients with confirmed diagnosis of perforated duodenal ulcer fulfilling the inclusion criteria. A semi-structured Questionnaire was designed for the study.*

***Results**: Out of a total of 200 patients operated for perforated duodenal ulcer 100 patients were fulfilling study criteria. Among these100 patients 80 were males and 20 were females. The participants were ranging from 18 to 72 years in age with mean age of 47.02±13.42 years. Helicobacter pylori were found in 80(80%) patients on histopathology and 65 (65%) patients on rapid urease test. Infection rates were maximum in the elderly and those belonging to poor socioeconomic class. All infected patients were treated with triple regimen eradication therapy comprising of clarithromycin, Proton Pump Inhibitor (PPI), and amoxicillin for 14 days. The patients were not followed to confirm eradication status.*

***Conclusion**: The spectrum of H. Pylori infection is very high in patients with duodenal ulcer perforation. An early and appropriate H. Pylori eradication therapy may prevent duodenal ulcer perforation.*

***Key words**: Helicobacter pylori, Duodenal ulcer, Peroforated duodenal ulcer, Eradication therapy.*

This article may be cited as: Haider I, Hussain D, Mohammad A. Spectrum of Helicobacter Pylori in 100 patients presenting with Perforated Duodenal Ulcer. J Postgrad Med Inst 2011; 25(4): 347-51.

INTRODUCTION

Helicobacter pylori, a gram negative spiral flagellated bacterium is one of the most genetically diverse organisms. It remains viable in the hostile environment of stomach by urease which catalyzes the breakdown of urea to alkaline ammonia and CO_2 by this means. H. Pylori protects itself from acid injury by surrounding itself with alkaline material[1].

Approximately more than half of the world's population is infected with H. Pylori[2]. The infection appears to spread from person to person probably by fecal-oral route[3]. Rates of gastric infection with H. Pylori are inversely proportional to socioeconomic status and the prevalence of infection increases with age within populations[4]. In developing countries, children between the ages of 2 to 8 years acquire H. Pylori infection at the rate of approximately 10% per annum[5]. As a result now a days, most adolescents and adults in developing countries are infected with H. Pylori[6]. Western world acquires H. Pylori infection at an elder age and prevalence of infection is approximately 50% of those older than age 60[7].

H. Pylori is strongly associated with peptic ulceration of the duodenum and stomach. The prevalence of H. Pylori infection in duodenal ulcer patients is 75-90% while with gastric ulcer 50-60%[8,9]. The development of peptic ulcer disease in infected individuals involves complex and poorly understood interactions among a number of factors including the susceptibility of the host and the virulence of the infecting strains[10].

Although Helicobacter pylori is now considered to be the most common cause of duodenal ulceration, there are very few reports

[1]Department of Medicine, Khyber Teaching Hospital, Peshawar - Pakistan

[2,3]Department of Surgery, Lady Reading Hospital, Peshawar - Pakistan

Address for Correspondence:
Dr. Iqbal Haider
Senior Registrar,
Department of Medicine, Khyber Teaching Hospital Peshawar - Pakistan
E-mail: driqbalhaider@yahoo.com

Date Received: April 28, 2009
Date Revised: November 18, 2010
Date Accepted: September 15, 2011

regarding the prevalence of H. Pylori infection in perforated duodenal ulcers. International studies are reporting the frequency of H. Pylori in duodenal ulcer perforation in the range of 0-100%[11-14]. Keeping these facts in mind, the present study was conducted to draw the association between H. Pylori infection and perforated duodenal ulcers. Many invasive and non invasive tests are used to diagnose H. Pylori infection in patients with peptic ulcer. When an interventional procedure such as endoscopy or surgery is needed for other reasons then the preferred tests are rapid urease test and antral biopsy[15]. Rapid urease test is having a sensitivity and specificity of around 90% & 100% respectively[16]. This study was thus planned to find out the frequency of Helicobacter pylori in patients presenting with perforated duodenal ulcer.

METHODOLOGY

This observational study was conducted in Emergency Department, Lady Reading Hospital Peshawar from July 2004 to January 2005. Two hundred patients irrespective of gender and age with the established diagnosis of perforated duodenal ulcer on the basis of history, physical findings, radiologic and biochemical parameters were included in the study. A specific questionnaire was designed comprising detailed history, general physical examination, history of Non-Steroidal Anti-Inflammatory Drugs (NSAID) use, history of regular use of H-2 receptor blocker or proton pump inhibitors (PPI), smoking and alcoholism, upper or lower GI bleed and features suggestive of acute duodenal perforation i.e. severe abdominal pain, abdominal rigidity and tenderness, nausea, vomiting and fever. Patients and /or their attendants were informed and written consents were obtained if they met study criteria to participate in study.

All patients irrespective of gender and age who presented with duodenal ulcer perforation and willing to give informed consent for study were included. Patients with perforated duodenal ulcers having history of NSAID use in previous month, or those patients with perforated duodenal ulcers giving history of use of proton pump inhibitors (PPI) or H-2 receptor antagonist in last 10 days of presentation were excluded from the study.

The reason being that NSAIDs may cause perforated duodenal ulcer independent of H. Pylori and may decrease the sensitivity of the diagnostic tests while PPIs & H-2 blockers may affect the results of urease test[17].

All 200 patients with perforated duodenal ulcer underwent surgery. Peroperative biopsies were taken from ulcer margins and antral mucosa for Helicobacter pylori in 100 patients meeting the study criteria. All the specimens were then sent to Histopathology Department Lady Reading Hospital Peshawar. The gold standard for H. Pylori infection was evidence of H. Pylori infection on histological examination using warthin starry silver and H&E stains. However for quick diagnosis, a rapid urease test was used so that H. Pylori eradication therapy can be instituted immediately.

RESULTS

Two Hundred patients underwent surgery for perforated duodenal ulcer during the study period. Out of 200 patients 100 were not meeting the study criteria. Out of these100 patients not meeting the study criteria 33% patients were giving history of regular use of either H-2 receptor blocker or proton pump inhibitors; 13% patients had taken Helicobacter pylori eradication therapy but ineffective dosage while 54% patients were taking PPI on long term basis on and off with a minimum of one dose in the preceding 10 days. Among 100 patients meeting study criteria 80 were males and 20 were females. The ages of patients ranged from 18 to 72 years with mean age of 47.02±13.42 years (Figure 1). Helicobacter pylori

Figure 1: Age distribution of patients

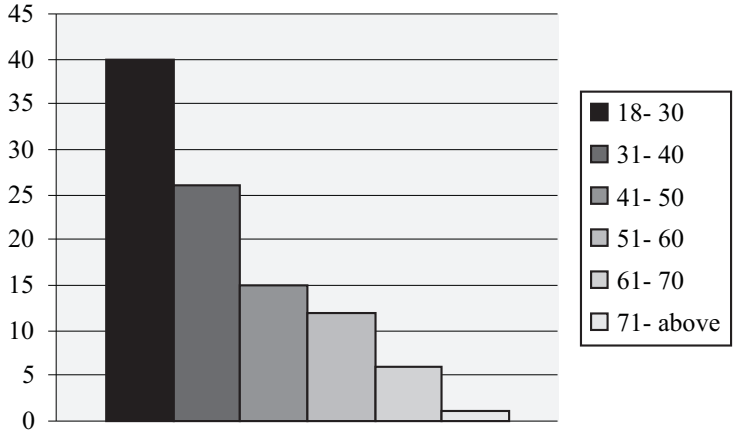
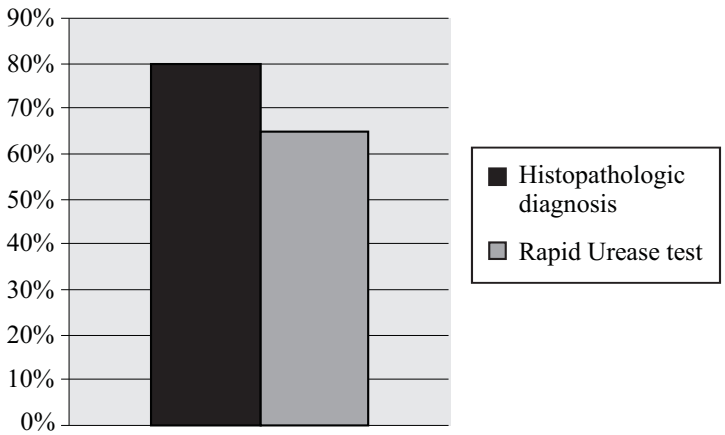


Figure 2: Detection of H. Pylori



were found in 80 (80%) patients having acute perforated duodenal ulcer on histopathology and 65 (65%) patients on rapid urease test (Figure 2). Ninety (90%) patients belonged to low socioeconomic class. All the infected patients were treated with combination of clarithromycin, amoxicillin and proton pump inhibitor (PPI) for two weeks. However, PPI was continued for another 4 weeks to promote healing.

DISCUSSION

Helicobacter pylori is one of the most common infections found in humans worldwide. H. Pylori was first cultured and identified in 1982 by two Australians, J Robin Warren and Barry J Marshall as a causative factor for peptic ulcers[11]. Dr. Warren and Dr. Marshall were awarded the Nobel Prize in Physiology 2005 for their discovery of bacterium Helicobacter pylori and its role in gastritis and peptic ulcer disease[18].

Although the role of H. Pylori infection in non-complicated peptic ulcer disease is well established, the precise relationship between the organism and peptic ulcer complication has hardly been studied. The mean prevalence of H. Pylori infection in patients with perforated peptic ulcer is only about 65-70%,which contrasts with the almost 90-100% reported in non complicated duodenal ulceration[19-21]. H. Pylori infection rates in various studies range markedly from 0-100% suggesting that differences in variables such as number and type of diagnostic methods used to diagnose H. Pylori infection or frequency of NSAID intake may be responsible for the low prevalence reported in some studies[22,23]. Recurrent ulcer disease after peptic ulcer perforation mainly occurs in patients with H. Pylori infection suggesting that the micro-organism plays an important role in this complication[24,25].

There were total of 80 males and 20 females in this study. Their ages ranged from 18 to 72 years with mean age of 47.02±13.42 years.H. Pylori was confirmed on histopathology in 80% cases and 65% on rapid urease test. These findings are however lower than that of Marshall study[11] (n=100) in which H. Pylori was documented at a rate of 100% in duodenal ulcer perforation. However, their staining technique and organism identification were not clearly defined as Marshall included all unidentified curved bacilli as H. Pylori. This explains the possible difference of very high rate of H. Pylori infection in Marshall study.

In a similar trial (n=94) by Zahid A, et al[12], 85.1% (n=80) patients were positive for H. Pylori infection with M: F ratio of 7:1 and ages ranged from 20-70 years. These findings are comparable with our study but they included 94 consecutive patients suffering from acute peptic ulcer (Duodenal and Gastric) perforation.

Another study conducted by Asad K, et al[26] (n=85) demonstrated H. Pylori infection in 56.46% (n=48) by identification of antibodies against H. Pylori by ELISA method. Ages of patients ranged from 30-70 years with M: F ratio of 9:1.H. Pylori infection rate is lower in this study as compared to our study mainly due to different selection criteria and diagnostic technique based on serology.

Zahid N, et al[19] (n=30) reported H. Pylori infection rate of 76.67% by serologic testing for the presence of IgG antibody against H. Pylori with M: F ratio of 6.7:1.The difference with our study can be explained on the basis of limited patients(n=30) and serology based diagnosis. Serologic testing for H. Pylori antibody (IgG) by ELISA is highly sensitive (98%) but lacks specificity (48%)[17].

The gender, age distribution and H. Pylori infection rate in our study is comparable with the national studies but is much higher than that

conducted internationally[27-29]. This finding is explainable on the basis of socioeconomic status and good hygienic condition of the developed world.

CONCLUSION

Helicobacter Pylori was associated with 80% of acute perforated duodenal ulcers. Earlier diagnosis and effective treatment of Helicobacter Pylori infection may prevent complications of duodenal ulcer.

ACKNOWLEGEMENTS

The authors thank Mr. Arshad, Mrs. Saima Saeed and Mr. Qadir for helpful discussion and excellent technical assistance.

REFERENCES

1. Graham DY, Qureshi WA. Markers of infection. In: Mobley HLT, Mendez GL, Hazells, editors. Helicobacter pylori: physiology and genetics. Washington DC: ASM Press; 2005. p. 499-500.
2. The EUROGAST Study Group. Epidemiology of, and risk factors for, helicobacter pylori infection among 3194 asymptomatic subjects in 17 populations. Gut 1993;34:1672-6.
3. Evert JE. Recent developments in the epidemiology of helicobacter pylori. Gastroenterol Clin North Am 2000;29:559-78.
4. Leal- Herrera Y, Torres J, Monath TP. High rates of recurrence and of transient reinfections of helicobacter pylori in a population with high prevalence of infection. Am J Gastroentrol 2006;98:2395-7.
5. Marshall BJ. Helicobacter pylori. Am J Gasterenterol 1994;89:116-28.
6. Mendall MA, Goggin PM, Molineux N. Childhood living conditions and Helicobacter pylori seropositivity in adult life. Lancet 2005;339:896-7.
7. Javed Y, Nadim J, Wasim J, Sara Z, Lim Chuan B. Polymerase chain reaction in the detection of Helicobacter pylori infection. J Coll Physicians Surg Pak 2004;14:153-6.
8. Coghlan JG, Gilligan D, Humpries H, Mekenna D, Dooley C, Sweeney E, et al. Helicobacter pylori and recurrence of duodenal ulcers: a 12 month follow up study. Lancet 1987;2;1109-11.
9. Lambert JR, Dunn KL, Eaves ER, Korman MG. Helicobacter pylori in human stomach. Med J Aust 1985;43:74-7.
10. Lam SK. Pathogenesis and pathophysiology of duodenal ulcer. Clin Gastroentrol 1999;54:507-9.
11. Marshall BJ, Warren JR. Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration. Lancet 1984;1:1311-5.
12. Zahid A, Viqar A, Jehangir K. Prevalence of helicobacter pylori in perforated peptic ulcer. J Postgrad Med Inst 2002;16:195-9.
13. Abbas SZ, Abass AB, Crawshaw A, Shaw S, English J, Vivian G, et al. Diagnosis and eradication of helicobacter pylori in patients with duodenal ulceration in the community. J Pak Med Assoc 2003;53:90-4.
14. Gisbert JP, Pajares JM. Frequency of helicobacter pylori in complicated peptic ulcer. Helicobacter 2003;83:159-67.
15. Chey WD, Wong BC. American College of Gastroenterology Guideline on the management of helicobacter pylori infection. Am J Gastroentrol 2007;102:1808-25.
16. Laine L, Lewin D, Naritoku W, Estrada R. Prospective comparison of commercially available rapid urease tests for the diagnosis of helicobacter Pylori. Gastrointest Endosc 1996;44:523-6.
17. Weston AP, Campbell DR, Hassanein RS, Cherian R, Dixon A. Prospective multivariate evaluation of CLO test performance. Am J Gasteroenterol 1997;92:1310-5.
18. Armstrong RM, Gregory AT. The 2005 Nobel prize in physiology. Med J Aust 2005;18:612-4.
19. Zahid N, Salman B, Imran A, Tariq L. Prevalence of helicobacter pylori and its implications in perforated duodenal ulcer. Biomedica 2001;17;6-10.
20. Emin G. Changing trend in emergency surgery for perforated duodenal ulcer. J Coll physicians Surg Pak 2003;13:708-10.
21. Rauws E, Tytgat GN. Cure of duodenal ulcer associated with eradication of helicobacter pylori. Lancet 1990;335:1233-5.
22. Blaser MJ. The versatility of helicobacter pylori in the adaptation to the human stomach. J Physiol Pharmacol 1997;48:307-14.
23. MCnulty CA, Watson DM. Spiral bacteria of the gastric antrum. Lancet 1984;1:1068-9.
24. Svanes C. Trends in perforated peptic ulcer: incidence, etiology, treatment and prognosis. World J Surg 2005;24:277-80.
25. Gunshefski I, Flancbaum L, Brolin RF, Frankel A. Changing patterns in perforated peptic ulcer

disease. Am Surg 2004;56:270-1.

26. Asad K, Attaullah A, Muzaffarudin S, Mumtaz K. Frequency of helicobacter pylori in patients presented with perforated peptic ulcer. J Postgrad Med Inst 2007;21:25-8.
27. Graham DY, Lew GM, Evans DG, Evans JR, Klein PD. Effect of triple therapy on duodenal ulcer healing. A randomized controlled trial. Ann Intern Med 1991;115:266-9.
28. Genta RM, Graham DY. Comparison of biopsy sites for the histopathologic diagnosis of helicobacter Pylori: a topographic study of H. Pylori density and distribution. Gastroenterol Endosc 2004;40:342-5.
29. Malfertheiner P, Megruad F, O'Morain C, Hungin AP, Jones R, Axon A, et al. Current concepts in the management of helicobacter pylori infection-the Maasterict 2–2000 consensus report. Aliment Pharmacol Ther 2005;16:167-80.

CONTRIBUTORS

IH conceived the idea, collected & analyzed the data and wrote the manuscript. DH and AM helped in surgical management of the patients. All authors listed contributed significantly in the submitted manuscript.

GRANT SUPPORT, FINANCIAL DISCLOSURE AND CONFLICT OF INTEREST

None Declared