Evaluation of Endoscopic Findings and Symptoms in Helicobacter Pylori Infected Adults: A Retrospective Case Control Study in a Tertiary Hospital

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Abstract

Significance: Helicobacter pylori (H. Pylori) infection has a role in the pathogenesis of chronic gastritis, ulcer disease, and gastric malignancies. Hence, a vigilant approach is necessary to be able to determine the H. Pylori infection status of patients. There have been conflicting data regarding the association of findings and symptoms to the presence of Pylori infection. The objectives of this study are to determine the association of the specific endoscopic findings and dyspeptic and reflux symptoms to the presence of H. Pylori Infection by rapid urease testing in a tertiary referral hospital. **Methodology**: Using a retrospective case control design with purposive sampling, nine hundred sixty-six (966) records of in and out adult patients have been reviewed. Inclusion criteria were: esophagogastroduodenoscopy (EGD) due symptoms of dyspepsia/ reflux symptoms. Patients with no symptoms pertaining to dyspepsia and reflux, negative EGD findings, and those who have no rapid urease testing were excluded in the study. Demographic profile, endoscopic findings and presenting symptoms were reviewed and analysed. **Results:** Binary logistic regression was done to determine the odds ratio (OR) of independent predictors for H. Pylori positivity by RUT: atrophic gastritis (OR 1.8 p=0.011), gastric (OR=3.03 P=0.0001) and duodenal (OR=4.97 p=0.001) ulcers, and malignancies of the stomach (OR=64.43, p=0.0001) and the duodenum (OR=29.32, p=0.006). Limitations of the study include: utilization of RUT, retrospective design, and a lone center database. **Conclusion:** Presence of atrophic gastritis, gastric and duodenal lesions such as ulcer and malignancy are independent predictors for H. Pylori infection, based on data from an institution with 9.94% RUT positivity rate. **Keywords:** Helicobacter Pylori Infection, Rapid urease testing, Endoscopic findings

Introduction

Helicobacter pylori (H. pylori) infection plays an important role in the pathogenesis of chronic gastritis, peptic ulcer disease, gastric adenocarcinoma, and mucosa-associated lymphoid tissue lymphoma[1]. Recent studies have demonstrated that a strategy to test and treat H. pylori in uninvestigated, dyspeptic patients in primary care is safe and reduces the need for endoscopy.[2] In addition, the indications to test and eradicate H. pylori have expanded even to subjects who do not have upper gastrointestinal symptoms, including first-class relatives of patients with gastric cancer and patients requiring long-term therapy with aspirin or non-steroidal anti-inflammatory drugs[3]. Taking these points into consideration, a more vigilant approach must be undertaken to be able to determine the H. Pylori infection status of patients so that prompt and adequate treatment may be administered. Various studies have been done to determine a relationship between symptoms and endoscopic findings to the status of H. Pylori infection. In a study of 200 Japanese young adults by Kamada in 2006, rates of H. pylori infection were 1.2% in normal, 95.8% in gastritis, 97.8% in duodenal ulcers, 100% in gastric ulcers, and 100% in gastric carcinomas[4]. However in a study by Adu-Aryee in 2016 of 76 adults, endoscopic diagnosis test do not predict H. Pylori infection status, the study however reported that symptom severity (OR 12.06) and a female gender (OR 2.73) is associated with H. Pylori infection[5]. In a local study by Gestura in 2004, sixty percent (60%) of the study population was positive for H. pylori infection (mean age of 44 years ± 13), 70% were males. H. pylori culture showed a sensitivity of 45% (95% CI [29.5– 62.1]), specificity of 98% (95%CI [81.5–100%]), positive likelihood ratio of 19.93 (95% CI [1.254– 317.04]) and a negative likelihood ratio of 0.56 (95% CI [0.406–0.772])[6]. All H. pylori strains isolated were sensitive to metronidazole, clarithromycin, amoxicillin and tetracycline.

The objectives of this study is to determine the association of the specific endoscopic findings and dyspeptic and reflux symptoms to the presence of H. Pylori Infection (determined through a Rapid Urease Test or RUT) in a local tertiary referral hospital.

Materials and methods

Using a retrospective case control design, the study was conducted in the endoscopy unit of tertiary teaching referral center in Manila Philippines. Purposive sampling of records was done. Preliminary screening of data was achieved by review of electronic records. The records of nine hundred sixty-six (966) in and out patients from 18 to 100 years old have been reviewed. Inclusion criteria were presentation for esophagogastroduodenoscopy (EGD) due symptoms of dyspepsia (epigastric pain, bloatedness/belching, rumbling in the stomach, hunger pain, post-prandial fullness) and reflux (heartburn or acid regurgitation) symptoms with documentation of H. Pylori infection status by RUT. Baseline information such as age, gender weight, height, body mass index (BMI) active smoking history and symptoms were obtained from the patient charts and corresponding endoscopic findings were taken by review of electronic records. Patients with no symptoms pertaining to dyspepsia and reflux as well

as negative EGD findings were excluded in the study. Patients who underwent EGD with no determination of H. Pylori infection status RUT were likewise excluded.

Esophagogastroduodenoscopy (EGD)

An EGD was performed without or without premedication after an over- night fast. Endoscopic diagnosis was made at the discretion of the endoscopist. Endoscopic findings were evaluated by one attending gastroenterologist and at least 1 assisting gastroenterology fellow who are masked by as pertaining to H. Pylori status. Disagreement was resolved by discussion.

Rapid Urease Test (RUT)

Biopsy samples(ranging from 1-2), approximately 2–3 mm each were taken from the antral and gastric body mucosa and placed on the yellow colored well containing urea and a pH indicator. The production of the urease enzyme by H. pylori results in the decomposition of urea into bicarbonate and ammonia which causes the pH to rise and the colour of the dot to change from yellow to red or pink. Positive results were read within 5 to 30 min. Samples that were weakly positive took up to 1 h to develop and no colour change at 1 h was regarded negative.

Statistical Analysis

All data retrieved from chart and endoscopic report review recorded were transferred to an electronic spreadsheet (Microsoft Excel 2010) and were encoded. Data from electronic spreadsheets were imported into Stata™ version 13 (StataCorp, College Station, Texas, United States) for statistical analyses. Data were summarized as frequencies and proportions. With an alpha (level of confidence) of 0.05 and beta (predicted relationship or power) 0.8 with medium effect size, three hundred seventy-two (372) subjects were needed in the study to meet minimum requirements.

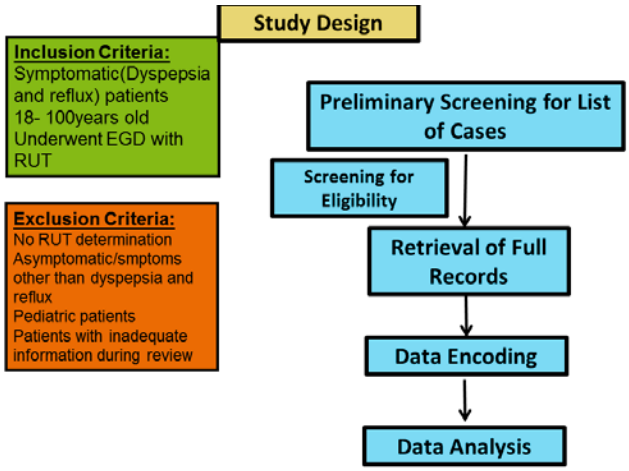

Figure 1. Study Design

Results and Discussion

Nine hundred and sixty-six (966) subjects were included in the study. Mean ages for RUT positive patients is 55.63 (±13.47) and 48.98 (±16.35) for RUT negative with a significant difference (p=0.0001 by Chi Squared) between the two groups. A positive RUT was more commonly observed in an elderly subset of patients. No significant differences were seen in the two groups in terms of gender, smoking status, as well as in height, weight and BMI (T-Test).

Endoscopic diagnosis were as follows; 365 (37.7%) subjects with esophagitis, 343(35.5%) with hiatal hernia, 629(65%) patients with acute gastric mucosal erosions(AGME) , 88(9.1%) as chronic atrophic gastritis(CAG), 26(2.69%) with duodenal ulcers, 9(10.04%) with duodenitis, 88(9.1%) with gastric ulcers, 6(0.62%) with gastric malignancy and 4(0.4%) with duodenal malignancy. 99(9.94%) subjects tested positive for H. Pylori infection by RUT and 867 patients were RUT negative. Significant differences (Chi-squared) were seen between the two groups in terms of the occurrence of AGME, CAG, as well as gastric ulcers and mass and duodenal ulcers and mass, all more commonly seen in RUT positive patients.

Due to the outcomes being nominal, binary logistic regression was performed. Among endoscopic findings with significant p-values CAG was noted to be 1.8 times more common to be seen in RUT positive patients. Gastric (OR=3.03 P=0.0001) and duodenal (OR=4.97 p=0.001) ulcers was also more commonly associated with RUT positivity. Malignancies of the stomach (OR=64.43, p=0.0001) and the duodenum (OR=29.32, p=0.006) were also noted to be seen in more RUT positive cases.

In the results of the study AGME(OR= 2.04, p=0.02) seems to be a protective of H. Pylori positivity, however this result may be due to over reporting of this finding especially in RUT negative cases.

In contrast to other studies done previously, this study did not report any role of symptoms in the presence of H. Pylori positivity by RUT.

Table 1.
Demographic Profile of Respondents according to H. pylori Status (N = 966)

Characteristic	*H. pylori* Positive(N=99)	*H. pylori* Negative(N=867)	*p*-value
Age	55.63 (±13.47)	48.98 (±16.35)	0.0001
Sex			0.814
Male	39 (39.39%)	331 (38.17%)	
Female	60 (60.60%)	536 (61.82%)	
Height (m)	1.63 (±0.08)	1.64 (±0.08)	0.0986
Weight (kilogram)	65.19 (±9.11)	65.66 (±11.55)	0.6991
BMI (kg/m^2)	24.54 (±3.34)	24.28 (±4.13)	0.5386
Smoking Status			0.314
Smoker	10 (1.04%)	63 (6.52%)	
Non-Smoker	89 (9.21%)	803 (83.13%)	

Table 1. Demographic Profile

Table 2.
Endoscopic Findings, Symptoms, and H. pylori Status (N = 966)

Characteristic	*H. pylori* Positive (N=99)	*H. pylori* Negative(N=867)	*p*-value
ENDOSCOPIC FINDINGS			
Esophagitis	42(42.4%)	323(37.3%)	
ESO A	37 (37.3%)	281(32.4%)	0.319
ESO B	3 (3.03%)	32 (3.69%)	0.739
ESO C	2 (2.02%)	10 (1.15%)	0.353
HH	28 (28.2%)	315 (36.33%)	0.113
AGME	49 (49.4%)	580 (64.6%)	0.001
CAG	21 (21.2%)	67 (7.72%)	0.006
Duodenal Ulcer	9 (9.09%)	17 (1.96%)	0.0001
Duodenal Mass	3 (3.03%)	1 (0.12%)	0.004
Duodenitis	9 (9.09%)	88 (10.15%)	0.740
Gastric Ulcer	21 (21.2%)	67 (7.72%)	0.0001
Gastric Mass	5 (5.05%)	1 (0.12%)	0.0001
DYSPEPSIA SYMPTOMS			
Epigastric Pain	64 (64.6%)	609 (70.24%)	0.251
Bloatedness	4 (4.04%)	51 (5.88%)	0.454
Hunger Pain	0 (0.00%)	8 (0.92%)	1.00
Fullness	0 (0.00%)	1 (0.12%)	1.00
REFLUX SYMPTOMS			
Heartburn	2 (2.02%)	27 (3.11%)	0.760
Regurgitation	00 (0.00%)	1 (0.12%)	1.00

Table 2. Endoscopic Findings, Symptoms, and H.Pylori Status

Table 3.
Binary Logistic Regression of the Predictors of H. pylori Development (N = 966)

Predictors	Helicobacter pylori Development		
	Odds Ratio (95% CI)	Beta Coefficient (SE)	*p*-values (Two-tailed)
ENDOSCOPIC FINDINGS			
ESO	1.24 (–1.23, 1.89)	0.22 (0.22)	0.316
ESO A	1.19 (0.74, 1.91)	0.18 (0.24)	0.466
ESO B	1.14 (0.32, 4.03)	0.13 (0.64)	0.840
ESO C	1.79 (0.37, 8.69)	0.58 (0.81)	0.470
HH	–1.45 (–2.38, 1.12)	–0.37 (0.25)	0.133
AGME	–2.04 (–3.23, –1.32)	–0.72 (0.23)	0.02
CAG	1.80 (1.14, 2.84)	0.59 (0.23)	0.011
Duodenal Ulcer	4.97 (1.92, 12.87)	1.60 (0.49)	0.001
Duodenal Mass	29.32 (2.8, 333.54)	3.38 (1.24)	0.006
Duodenitis	1.96 (–4.76, 1.26)	–0.67 (0.46)	0.144
Gastric Ulcer	3.03 (1.66, 5.50)	1.11 (0.30)	0.0001
Gastric Mass	64.43 (6.99, 593.79)	4.17 (1.13)	0.0001
DYSPEPSIA SYMPTOMS	–1.45 (–2.27, 1.09)	–0.37 (0.23)	0.111
Epigastric Pain	–1.54 (–2.43, 1.04)	–0.43 (0.24)	0.073
Bloatedness	–2.00 (–5.88, 1.47)	–0.70 (0.55)	0.206
Hunger Pain	1.00	–	–
Fullness	1.00	–	–
REFLUX SYMPTOMS	–1.66 (–7.14, 2.54	–0.52 (0.74)	0.483
Heartburn	–2.17 (–10.00, 2.02)	–0.79 (0.76)	0.300
Regurgitation	1.00	–	–

Table 3. Binary Logistic Regression

Limitations

One of the limitations of our study the utilization of RUT for determination of H. Pylori infection status as the reference standard (histopathology) is expensive and is not time efficient to be used in practice. False positive result may be determined by the use of another non-invasive screening test like stool antigen or urea breath testing. A prospective trial maybe recommended in future studies to be able to provide randomization, standardization of endoscopic findings and utilize other mean means of diagnosis of H. Pylori infection for more accurate results. This study was also undertaken in a single tertiary center, which may not be a general representation of patient suffering from H.Pylori infection in the country, although the patients seen in the institution came from variety of ethnic groups and socioeconomic backgrounds. A multi-center study may be able to include more subjects.

Conclusion

Based on the retrospective case control study in a single tertiary center with 9.94% RUT positive rate for H. Pylori, the presence of CAG, as well as the identification of gastric and duodenal lesions such as ulcer and malignancy was well as age has positive association. On the other hand, presenting symptoms on endoscopy have no proven relationship with H. Pylori infection status.

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