Prevalence of *Helicobacter pylori* infection in dyspeptic patients in Iran

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Abstract

Although *Helicobacter pylori* (*H. pylori*) infection has been known to be associated with several upper gastrointestinal disorders such as peptic ulcer and gastric cancer, the relationship between *H. pylori* infection and dyspeptic symptoms remains controversial. Furthermore, it is still not clear which factors are associated with *H. pylori* infection in the Iranian population. We investigated the prevalence of *H. pylori* infection in dyspeptic patients and factors associated with *H. pylori* infection in the Iranian population. In this cross-sectional study, 303 patients with dyspeptic symptoms underwent endoscopy. Clinical data and a questionnaire about gastrointestinal symptoms were collected from each patient. *H. pylori* status was evaluated by histological examination. Among the 303 patients, 263 (86.8%) were found to be positive for *H. pylori*. The prevalence of *H. pylori* infection decreased significantly with age. There was no difference in the prevalence of *H. pylori* infection between the patients with and those without a family history of gastroduodenal diseases. Among 250 patients with abdominal pain, 219 (87.6%) were infected with *H. pylori*. Among 211 patients with epigastric abdominal pain, 185 (87.7%) were infected with *H. pylori*. It was observed that belching was significantly associated with *H. pylori* infection (P = 0.03). Dyspepsia triggered by the consumption of tea was higher in *H. pylori*-positive patients than in *H. pylori*-negative patients (P=0.03). The prevalence of *H. pylori* infection in dyspeptic patients was quite high in Iran. Belching and dyspepsia triggered by tea consumption was related with *H. pylori* infection.

Introduction

Helicobacter pylori (*H. pylori*) are Gram-negative bacteria that colonize gastric mucosa. They are the most important etiological agents for peptic ulcer disease, gastric carcinoma and mucosa-associated lymphoid tissue lymphoma.[1-3] Infection with *H. pylori* mainly occurs in early childhood and shows life-long persistence in most infected individuals.[4,5] Because of the high risk of *H. pylori* transmission from adults to children, especially from parents in a family setting, prevalence of *H. pylori* in childhood is related to its prevalence in adults.[6,7]

In addition to the virulence of *H. pylori*, host and environmental factors determine clinical outcome. It has been reported that the prevalence of *H. pylori* infection was related to several of these factors, including socioeconomic status, crowded living conditions, low levels of hygiene, age, geographical region, ethnic group, cigarette and alcohol consumption.[8-10] Also, prevalence of *H. pylori* infection differs both between and within countries.[11,12]

Although in the Iranian population the prevalence has been reported to range from 57 to 91%,[13-17] the factors associated with *H. pylori* infection have not been clarified. In addition, there have been no reports about the prevalence of *H. pylori* infection in dyspeptic patients in Iran.

The aim of this study was to investigate the prevalence of *H. pylori* infection in dyspeptic patients and factors associated with *H. pylori* infection in an Iranian population.

Materials and Methods

Subjects

A cross-sectional study was carried out between April 2007 and January 2008. A total of 486 Iranian patients attended the endoscopy unit of the Taleghani Hospital, Shahid Beheshti University, for dyspeptic symptoms such as abdominal pain, anorexia, bloating, and belching. Patients who had received non-steroidal anti-inflammatory drugs, steroids or proton pump inhibitors within the previous three months, any antibiotics within the last month, and previous treatment for *H. pylori* infection were excluded. The remaining 303 patients were enrolled in the study. Of these, 172 (56.7%) were female and 131 (43.3%) male; mean age 42.2±15.5 years.

Clinical data regarding current and past medical history, and family history of peptic ulcer/gastric cancer were collected for each patient. Patients' demographics, including age, sex, and ethnicity, were also recorded. Gastrointestinal symptoms were evaluated from questionnaires completed by the patients that included questions concerning dyspeptic symptoms and their triggers.

This study was approved by the ethical committee of the Research Center for Gastroenterology and Liver Disease, Shahid Beheshti University, M.C. All patients provided written informed consent.

Evaluation of *H. pylori* infection

Endoscopy was performed according to standard procedures after an overnight fast. Histological assessment was made of *H. pylori* infection. Biopsy specimens were taken from the greater curve of the antrum. They were fixed overnight in buffered formalin, embedded in paraffin, cut to a thickness of 3 μm, and stained with hematoxylin-eosin (H&E) and modified Giemsa stain.

Statistical analysis

SPSS version 18 (SPSS, Chicago, IL, USA) was used for statistical analyses. Multivariate and univariate logistic regression was performed to investigate the relationship between *H. pylori* status and variables. P<0.05 was considered statistically sig-

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nificant. Odds ratios (OR) and 95% confidence intervals (CI) were calculated for demographic factors.

Results

Prevalence of *H. pylori* infection in dyspeptic patients

Table 1 shows the prevalence of *H. pylori* infection according to socio-demographic characteristics of the study population. Among 303 patients, 263 (86.8%) were found to be *H. pylori*-positive. There was no difference in prevalence of *H. pylori* infection according to gender. There was no statistically significant association between the prevalence of *H. pylori* infection and other patient demographic factors, such as education status or ethnic group. The prevalence of *H. pylori* infection decreased with age (Figure 1). When the patients were divided into two groups according to age (<39 *vs* ≥40 years), the younger group showed a significantly higher prevalence than the older group (P=0.01). There was no difference in prevalence of *H. pylori* infection between the patients with or without a family history of gastroduodenal diseases (P=0.80 for peptic ulcer, P=0.43 for gastric cancer) (Table 1).

Prevalence of *H. pylori* infection according to each abdominal symptom

The prevalence of *H. pylori* infection according to each gastrointestinal symptom is shown in Table 2. Abdominal pain, especially epigastric pain was the most common complaint among dyspepsia. There was no difference in the prevalence of abdominal pain between *H. pylori*-positive and *H. pylori*-negative patients (83.3% *vs* 77.5%; P=0.37). There was also no difference in the prevalence of epigastric abdominal pain between *H. pylori*-positive and *H. pylori*-negative patients (70.3% *vs* 65.0%; P=0.49). Interestingly, the prevalence of belching was significantly higher in the *H. pylori*-positive patients than in those who tested negative (65.0% *vs* 47.5%; P=0.03). Even after adjustment for age and gender in the multivariate analysis, *H. pylori* infection was independently associated with the presence of belching (OR=2.1, 95% CI = 1.1-4.3). There was no difference in the prevalence of heartburn between *H. pylori*-positive and *H. pylori*-negative patients (50.2% *vs* 37.5%; P=0.13).

Prevalence of *H. pylori* infection in patients with dyspepsia triggered by diet

We also examined any possible association between *H. pylori* infection and dyspepsia trig-

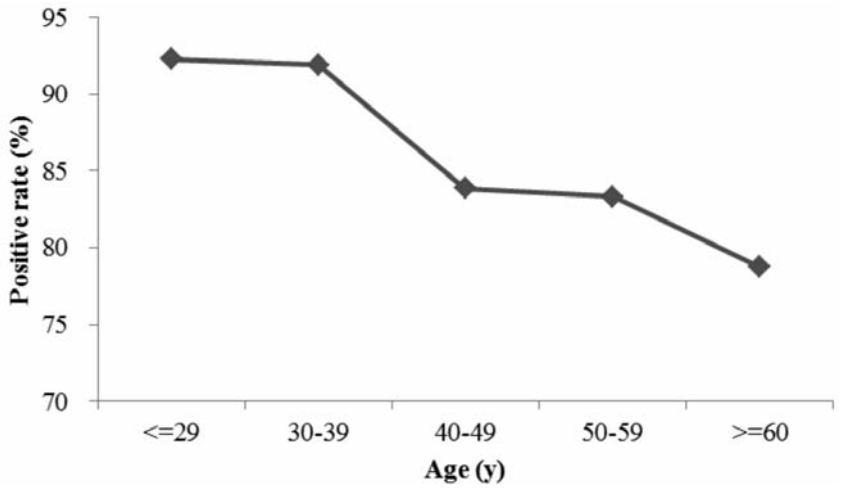

Figure 1. Prevalence of *H. pylori* infection.

Table 1. Comparison of *H. pylori*-positive and -negative dyspeptic patients.

	H. pylori-positive (n=263)	*H. pylori*-negative (n=40)	P
Mean age	41.5±15.5	47.0±14.1	0.02
Male	113	18	0.80
Education status			
High educated	144	24	
Low educated	119	16	0.53
Ethnicity			
Fars	148	21	
Other ethnicity	115	19	0.65
Family history			
Peptic ulcer	64	9	0.80
Gastric cancer	34	7	0.43

Table 2. Relationship between *H. pylori* status and abdominal symptoms.

Symptoms	*H. pylori*-positive (n=263)		*H. pylori*-negative (n=40)		P
Abdominal pain	219	83.3%	31	77.5%	0.37
Epigastric pain	185	70.3%	26	65.0%	0.49
Other localizations	31	11.8%	3	7.5%	0.59
Anorexia	98	37.3%	14	35.0%	0.78
Weight loss	70	26.6%	12	30.0%	0.65
Nausea	89	33.8%	17	42.5%	0.28
Vomit	39	14.8%	5	12.5%	0.69
Heart burn	132	50.2%	15	37.5%	0.13
Fatty food intolerance	91	34.6%	17	42.5%	0.33
Bloating	205	77.9%	29	72.5%	0.44
Belching	171	65.0%	19	47.5%	0.03
Early satiety	137	52.1%	18	45.0%	0.40
Melena	7	2.7%	1	2.5%	1.00
Dysphagia	10	3.8%	1	2.5%	1.00
Gastric fullness	113	43.0%	18	45.0%	0.80

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Table 3. Relationship between H. pylori status and pain triggered by the consumption of diets.

Trigger	*H. pylori*-positive (n=263)		*H. pylori*-negative (n=40)		P
Alcohol	2	0.8%	0	0.0%	1.00
Coffee	4	1.5%	0	0.0%	1.00
Tea	46	17.5%	1	2.5%	0.01
Fatty food	2	0.8%	0	0.0%	1.00
Spice	59	22.4%	4	10.0%	0.07
Pepper	63	24.0%	6	15.0%	0.20
Carbonated drink	85	32.3%	16	40.0%	0.33
Smoking	18	6.8%	1	2.5%	0.48
Milk	50	19.0%	3	7.5%	0.07
Raw and fruit and vegitable	59	22.4%	9	22.5%	0.99
Fast food	2	0.8%	0	0.0%	1.00

gered by diet. The prevalence of dyspepsia triggered by the consumption of tea was significantly higher in the *H. pylori*-positive patients than in those testing negative (17.5 *vs* 2.5 %; P=0.01) (Table 3). There was no association between consumption of coffee, spicy foods and *H. pylori* status.

Discussion

Dyspepsia is a common complaint in clinical practice.[18] Some reports have described that dyspeptic symptoms were more frequent among *H. pylori*-positive patients.[19,20] Although changes in gastric acid secretion by *H. pylori* infection or functional abnormalities in gastric movement might contribute to dyspepsia, the relationship between them has not been fully clarified. Few reports have described the prevalence of H pylori with dyspepsia in a hospital setting. In our previous study, over half of the dyspeptic Japanese patients were negative for *H. pylori*. Therefore, factors other than *H. pylori* might play a role in the development of dyspepsia in the hospital setting.[21] In this study, the prevalence of *H. pylori* infection in dyspeptic patients in Iran was quite high, which means *H. pylori* infection might be related to dyspeptic symptoms. The *H. pylori* infection rate in the Iranian population was reported to be 57-91%.[13-17] The prevalence of *H. pylori* infection in patients without dyspepsia would need to be examined in order to prove the relationship. Another way to evaluate the role *H. pylori* in dyspepsia would be to examine the improvement in symptoms after the infection has been cured.

In this study, there was no relationship between *H. pylori* positivity and gender. However some reports have indicated that males were at significant risk for the infection, while other studies indicated that the infection rate was independent of gender.[9] The prevalence of *H. pylori* was statistically higher in younger patients. Factors such as severe atrophy or intestinal metaplasia mean that the local environment is no longer ideal for the growth of *H. pylori*. This may contribute to the lower prevalence in elderly patients. *H. pylori* infection can be related to low levels of sanitation, hygiene, education.[8-10] In this study, no relationship was observed between education status and *H. pylori* infection. However, further studies are needed, especially in poor socioeconomic and rural areas.

It has been reported that infection with *H. pylori* can occur in childhood via the fecal-oral route and that it can result in the development of gastroduodenal diseases.[22,23] Therefore, *H. pylori* infection in individuals with a family history can increase the risk of developing gastroduodenal diseases. In our study, we did not observe any relationship between *H. pylori* infection and family history. Future studies are needed to examine the differences between strains of *H. pylori* concerning the effect of virulence factors in *H. pylori*-related diseases.

There was no association between *H. pylori* status and specific symptoms except for belching. This may be due to the high prevalence of *H. pylori*. There is little evidence of a relationship between dyspepsia and other symptoms, such as belching, and *H. pylori* infection. Strauss *et al*.[24] and Rokkas *et al*.[25] found a link between *H. pylori* and postprandial bloating and belching, while others report a relationship between *H. pylori* infection and gastrointestinal symptoms.[26-29]

The prevalence of *H. pylori* in patients with heartburn was 89.7% which was similar to that of abdominal pain. In general, gasteoesophageal reflux disease and heartburn were common in *H. pylori*-negative patients.[21] There was also high gastric acid secretion in *H. pylori* negative patients.[30] Endoscopic evaluation or measurement of output of gastric acid will be needed to clarify the difference.

In this study, dyspepsia triggered by the consumption of tea was significantly higher in *H. pylori*-positive patients. It is possible that tea could trigger dyspepsia in the advanced atrophic gastric mucosa induced by long-term *H. pylori* infection. A population-based study from Iran showed that consumption of hot and strong tea was an independent risk factor for gastric cancer.[31] Cellular damage induced by consumption of hot tea may explain this association. Consumption of hot food may play a role in the development of gastric cancer due to thermal irritation.[32] However, one study showed that green tea inhibits *H. pylori* growth in vivo and *in vitro*. 33 Further study is necessary to clarify these mechanisms.

In conclusion, the prevalence of *H. pylori* infection in dyspeptic patients in an Iranian population was quite high. To prove the significance of *H. pylori* infection in dyspeptic symptoms, it will be necessary to evaluate the improvement of symptoms after *H. pylori* eradication.

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