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The Relationship Between *Helicobacter pylori* Infection in the Stomach and Reflux Esophagitis in Patients Referring to Khorramabad Shohada Hospital, Lorestan Province, Southwest Iran between 2014 and 2018

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Abstract

Gastroesophageal reflux disease is a common disorder of the digestive tract. Esophageal mucosa exposure to gastric acid can lead to mucosal damage such as esophagitis. The aim of this study was to determine the relationship between Helicobacter pylori infection in the stomach and reflux esophagitis in patients referring to the endoscopy units of hospitals in Khorramabad between 2014 and 2018. In this cross-sectional study, all patients who referred for endoscopy to the Endoscopy Units of Shohadaye Ashayer and Shahid Rahimi Hospitals of Khorramabad during 2014-2018 were studied. H. pylori infection was diagnosed based on pathological specimens. All patients' information including age, sex, presence of esophagitis (its grade), and H. pylori infection were recorded in the questionnaires and their relationship with esophagitis and its grade as well as H. pylori infection was statistically analyzed. Tables and charts were used to describe the data. t-test and Chi-squared test were used to investigate the relationship between variables. The frequency of esophagitis in our patients was 52.8%, with the highest frequency obtained for grade B esophagitis (48%). In this study, the prevalence of H. pylori infection was 57.5%. This rate was 55.4% in patients with esophagitis, with a statistically significant difference to the group without esophagitis (P=0.0009). There was a significant relationship between grade A esophagitis and H. pylori infection

(P=0.0002). This study suggests a significant relationship between H. pylori infection and esophagitis in affected patients.

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Introduction

Helicobacter pylori (*H. pylori*) is a gram-negative, spiral, microaerophilic bacilli that can be isolated only from humans and other primates [1]. H. pylori infection is the most common infection in the world [1]. On average, half of the world's population is infected with H. pylori. The prevalence of H. pylori infection varies in different countries, with about 30% in developed countries, and around 90% in developing countries, including Iran [2-5]. Symptoms of the infection include decreased appetite, abdominal pain that occurs during the night or while eating, weight loss, pallor and other abdominal symptoms [6]. This bacterium is colonized in the gastric mucosal epithelium and, through the formation of oxidative stress, causes damage and apoptosis, thereby causing changes in the gastric epithelial tissue [7]. These changes include gastritis, peptic ulcers, and chronic pathological changes in the gastric mucosa, such as atrophy, metaplasia, adenocarcinoma and MALToma [8]. Gastroesophageal reflux disease (GERD) is a common disorder caused by an increase in the frequency or duration of esophageal contact with the contents of the stomach. Esophageal mucosa contact with gastric acid can lead to visible mucosal lesions in the endoscopy including erosive esophagitis, esophageal stricture, and Barrett's esophagus [9,10]. Esophagitis is characterized by mucosal erosion or mild mucosal changes, such as erythema and change in the white color of mucus. The severity of the esophagitis is determined by the Los Angeles classification, which includes 4 grades, A, B, C, and D. The prevalence of erosive esophagitis and Barrett's esophagus varies across the world. The results of epidemiological studies in developed countries show a high incidence of GERD and Barrett's esophagus [11]. Since the prevalence of H. pylori infection and GERD is high (9), some correlation is expected to exist between them. The results of studies show that H. pylori may be directly correlated esophagitis and GERD through various mechanisms. These mechanisms include increased acid secretion, direct infection of the columnar epithelium in the distal esophagus with H. pylori, and indirect damage due to release of harmful substances into the gastric juice [12]. Besides, colonization of the gastric mucosa with H. pylori can lead to diffuse and atrophic gastritis, which reduces gastric acid and therefore esophagitis [12]. The association between H. pylori infection and esophagitis has been controversial over the past decades. H. pylori infection, despite increasing the risk of peptic ulcer and gastric cancer, has been associated with a substantial reduction in the risk of esophagitis, Barrett's esophagus and esophageal adenocarcinoma [13]. Various studies have examined the association between H. pylori infection, Barrett's esophagus and adenocarcinoma, with contradictory results [14]. In developed countries, the frequency of H. pylori infection is low in the population, while the prevalence of esophagitis and its complications is high. This is the

opposite in developing countries such as China, India and some other countries, in which the prevalence of Helicobacter pylori is high and the incidence of esophagitis and its complications is low [9]. The results of some studies indicate that eradication of Helicobacter pylori may cause esophagitis reflux and exacerbate the symptoms of esophagitis [15]. Studies have shown a low prevalence of Helicobacter Pylori in patients with GERD or esophagitis, but the sample size was low in these studies (16).

Considering the high prevalence of esophagitis and *H. pylori* in endoscopic patients and the importance of *H. pylori* infection treatment and eradication, this study was conducted to investigate the relationship between *H. pylori* infection in the stomach and reflux esophagitis in patients referring to the Endoscopy Units of Shohadaye Ashayer and Shahid Rahimi Hospitals of Khorramabad during 2014-2018.

Materials and Method

Inclusion and exclusion criteria

All patients who underwent endoscopy for various reasons, such as gastrointestinal bleeding, dyspepsia, abdominal pain, anemia, and other signs of risk and indication, were included in the study if their information was complete. The exclusion criterion was reports with incomplete data.

The procedure of study

In this cross-sectional study, all patients who referred for endoscopy to the Endoscopy Units of Shohadaye Ashayer and Shahid Rahimi Hospitals of Khorramabad during 2014-2018 were studied. These patients were included in the study if their information was complete. If the information was incomplete, the person would be excluded from the study. Prior to pathological sampling and before the endoscopy, informed consent for the use of patient information in relevant research was obtained from all patients. All patient information was also kept confidential, and any disclosure of information was avoided. Identification codes were used to prevent the patient's registration of name and surname. The data were recorded in the SPSS software as numerical codes. The severity of esophagitis was determined by the Los Angeles classification, consisting of 4 grades, ie, A, B, C and D. Endoscopy was performed by two gastrointestinologists in the Endoscopy Units of Shohadaye Ashayer and Shahid Rahimi Hospitals by Fujinon 3500 Endoscopy. Endoscopic reports were drawn from the hospital system and information such as age, sex, cause of endoscopy, and current lesions in different parts of the digestive system were recorded in the checklist. Pathologic reports of these patients were obtained from pathology laboratories. The diagnosis of *H. pylori* infection was made based on pathological specimens.

All patients' information including age, sex, esophagitis and its grade, and *H. pylori* infection was recorded in the questionnaire. After data collection, the data were entered into the SPSS version 18 and analyzed for the association between esophagitis and its grade, and *H. pylori* infection.

Data analysis

Tables and charts were used to describe the data. *t*-test and chi-squared test were used to investigate the relationship between variables. The significance level in this study was considered to be <0.05.

Results

In this descriptive study, 5306 patients with GERD and dyspepsia symptoms who underwent upper endoscopy during 2014-2018 were studied for the association of reflux esophagitis and *H. pylori* infection. Of these, 49.2% were male

and 50.8% female. The mean age of the patients was 48.3±17.4 years. The frequency of esophagitis in these patients was 52.8%, with the highest frequency obtained for grade B esophagitis (48%). The results of this section are shown in Table 1.

Table 1. Demographic characteristics of patients

Variables	**The cumulative frequency**	**Number (%)**
Age 20 or less	9.5	(9.5%) 14
21-30	35.8	(26.4%) 39
31-40	56.1	(20.3%) 30
41-50	76.4	(20.3%) 30
More than 50 years	100	(23.6%) 35
Male	50	(50%) 74
Female	100	(50%) 74
Fischer (Negative)	81.8	(81.8%) 121
d2 positive	100	(18.2%) 27
Negative *H. pylori*	54.7	(54.7%) 81
Positive *H. pylori*	100	(45.3%) 67
Negative scalping	81.8	(81.8%) 121
d2 positive	100	(18.2%) 27
Negative atrophy	52.7	(52.7%) 78
Positive	100	(47.3%) 70
Marsh 1 Negative	87.8	(87.8%) 130
d2 positive	100	(12.2%) 18
March 2 negative	96.6	(96.6%) 143

Positive (d2)	100	(3.4%) 5
Marsh 3 Negative	90.5	(90.5%) 134
Positive (d2)	100	(9.5%) 14
Negative d.mild.atrophy	62.8	(62.8%) 93
Positive (d2)	96.6	(33.8%) 50
Positive (Bulb)	98	(1.4%) 2
d2& bulb	100	(2%) 3
Negative d.mod.atrophy	95.3	(95.3%) 141
Positive (d2)	100	(4.7%) 7
Negative d.severe.atrophy	94.6	(94.6%) 140
Positive (d2)	100	(5.4%) 8

In this study, the prevalence of *H. pylori* infection was 57.5%. This rate was 55.4% in patients with esophagitis, with a statistically significant difference to the group without esophagitis (P=0.0009). The results of this section are shown in Table 2.

Table 2. Relationship between esophagitis and *Helicobacter pylori* infection

Variables		**total**	***H. pylori***	
			Positive (%) **Number**	**Negative** (%) **Number**
Age 20 or less	0.52	(100) 14	%50	%50
21-30		(100) 39	35.9%	64.1%
40-31		(100) 30	56.7%	43.3%
50-41		(100) 30	46.7%	53.3%

More than 50 years old		(100) 35	42.9%	57.1%
Male gender	0.01	(100) 74	55.4%	44.6%
female		(100) 74	35.1%	64.9%
Fischer Negative	0.54	(100) 121	45.5%	54.5%
Positive (d2)		(100) 27	44.4%	55.6%
Negative scalping	0.29	(100) 121	43.8%	56.2%
Positive (d2)		(100) 27	51.9%	48.1%
Negative atrophy	0.08	(100) 78	51.3%	48.7%
Goodness		(100) 70	38.6%	61.4%
Marsh 1 Negative	0.03	(100) 130	40.8%	59.2%
Positive (d2)		(100) 18	77.8%	22.2%
March 2 negative	0.41	(99) 143	44.8%	55.2%
Positive (d2)		(100) 5	60%	40%
Marsh 3 Negative	0.53	(100) 134	45.5%	54.5%
Positive (d2)		(100) 14	42.9%	57.1%
Negative d.mild.atrophy	0.05	(100) 93	51.6%	48.4%
Positive (d2)		(100) 50	32%	%68
Positive (Bulb)		(100) 2	100%	0%
d2 & bulb		(100) 3	33.3%	66.7%
Negative d.mod.atrophy	0.39	(100) 141	44.7%	55.3%
Positive (d2)		(100) 7	57.1%	42.9%
Negative d.severe.atrophy	0.53	(100) 140	45%	55%
		(100) 8	50%	50%

The association between the severity of esophagitis and *H. pylori* infection is shown in Table 3. Based on our results,

there was a significant relationship between grade A esophagitis and *H. pylori* infection (P=0.0002). The results are shown in Table 3.

Discussion

Based on the results of this study, the frequency of esophagitis was 52.8%, with the highest frequency of the infection in patients with grade B esophagitis (48%). In this study, the prevalence of *H. pylori* infection was 57.5%. This rate was 55.4% in patients with esophagitis, with a statistically significant difference to the group without esophagitis (P=0.0009). There was a significant relationship between grade A esophagitis and *H. pylori* infection (P=0.0002).

Various studies have been conducted on the association between esophagitis and *H. pylori* infection. For example, different studies in Asia have shown an inverse correlation between *H. pylori* infection and reflux esophagitis. In a study in China, the prevalence of erosive esophagitis and Barrett's esophagus were reported to be 4.3% and 1%, respectively, suggesting that *H. pylori* infection is inversely correlated with erosive esophagitis [17]. The study of Chung *et al.* (2004-2007) in Korea showed that in patients undergoing upper endoscopy, the group with erosive esophagitis had a higher prevalence of *H. pylori* infection than the control group, and the prevalence of the infection was inversely correlated with esophagitis at different degrees [16]. The study of Lee *et al.* in Malaysia, which was performed on endoscopies, showed that 49.5% had esophagitis, 67.8% of whom were pathologically confirmed, and 77.7% of patients with diagnosis of esophagitis according to endoscopy results, had *H. pylori* [18]. Jonaitis (2011) conducted a study in all patients undergoing endoscopy in Lithuania, and found that the prevalence of erosive esophagitis was 11.75%, and the severity of erosive esophagitis and Barrett's esophagus were associated with a reduction in the prevalence of *H. pylori* infection and an increase in the size of the hiatal hernias. They found that the prevalence of erosive esophagitis and Barrett's esophagus in Lithuania, ie, a region with high prevalence of *H. pylori* infection, were low [11]. Studies in western countries have also shown that there is an inverse correlation between *H. pylori* infection and reflux esophagitis [19]. However, this relationship in our study was significant. For example, the study of Ashktorab *et al.* in the endoscopies in Washington during the 2004-2007, showed that there was an inverse correlation between esophagitis and *H. pylori* infection, and the infection played a protective role against the incidence of esophagitis [15]. However, in some studies, a direct correlation between *H. pylori* infection and esophagitis has been observed. For example, Fatin *et al.* in a study in patients with upper endoscopy in Turkey during 2006-2009, divided the patients into two groups *H. pylori*-infected and non-*H. pylori*-infected. It was observed that *H. pylori* infection and esophagitis and also its grade were directly correlated [10]. In addition, in the study of Batool in 2007-2009 in Baghdad, the prevalence of *H. pylori* infection in GERD patients and the control group were compared, which showed that the prevalence of the infection was significantly higher in the GERD group than in the control group [20]. The results of these studies are consistent with our study. Meanwhile, in the study of Grande *et al.* in Italy during 2010-2013, 184 patients with reflux symptoms were studied using manometry, esophageal pH measurements and biopsy. In that study, no association was observed between *H. pylori* infection and lower esophageal sphincter pressure, esophageal manometric waves and esophagitis in pathological examinations [12]. A study conducted by Grande in Italy in patients with GERD

showed that *H. pylori* infection had no significant association with GERD and erosive esophagitis [21]. In the study of Rodrigues in Brazil in GERD patients, the eradication of *H. pylori* infection did not affect the clinical, endoscopic and manometric characteristics of GERD [22]. In a study conducted by Kim in South Korea, the effect of *H. pylori* eradication on the incidence of GERD and esophagitis symptoms over a 2-year period was studied, and the eradication of this infection was found not to affect the incidence of GERD and esophagitis [23-27].

Conclusion

Our study showed that there was a significant relationship between *H. pylori* infection and esophagitis in patients with esophagitis, and the highest frequency of *H. pylori* infection was observed in grade B esophagitis (48%).

Acknowledgment

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Conflicts of interest

The authors declare no conflicts of interest.

Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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