








## RESEARCH ARTICLE

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## The Relationship Between Hyperplastic Gastric Polyps And Helicobacter Pylori

### ABSTRACT

**Objective:** Helicobacter pylori (H. pylori) is a gram-negative bacterium. It is urease positive, mobile, microaerophilic, and spiral-shaped, and it settles in the stomach and the proximal duodenum. It is associated with chronic gastritis, stomach ulcers, duodenal ulcers, stomach cancer, and MALT lymphoma. It can also cause premalignant lesions, such as metaplasia and gastric atrophy. Although several studies are investigating the correlation between H. pylori and hyperplastic polyps (HPs) of the stomach, uncertainty in this regard continues.

**Methods:** Data from 5378 patients who underwent esophagogastroduodenoscopy at the Department of Gastroenterology, Gülhane Training and Research Hospital, University Of Health Sciences between October 2016 and March 2019 were retrospectively analyzed, and patients with gastric polyps were evaluated for polyp pathologies and normal mucosa biopsies.

**Results:** Sixty-one stomach polyps were detected in 49 patients after the retrospective analysis of the data between October 2016 and March 2019. Of the polyps found, 36 were hyperplastic (73%). There was no statistically significant difference between HPs and the presence of H. pylori, age, gender, anatomical location of polyps in the stomach, size, number, presence of metaplasia, or atrophy. The mean age was statistically lower in H. pylori-positive cases.

**Conclusions:** No correlation was observed between HPs and the presence of H. pylori. There is a need for more extensive, multi-centered, and prospective studies evaluating the relationship between HPs and H. pylori.

**Keywords:** Helicobacter Pylori, Hyperplastic, Stomach, Polyp.

## Hiperplastik Mide Polipleri İle Helikobakter Piloni Arasındaki İlişki

### ÖZET

**Amaç:** Helikobakter pilori (H. pilori), gram-negatif bakteridir. Üreaz pozitif, hareketli, mikroaerofilik, spiral şekilli olup mide ve proksimal duodenuma yerleşmektedir. Kronik gastrit, mide ülseri, duodenum ülseri, mide kanseri ve MALT Lenfoma gibi hastalıklarla ilişkilidir. Ayrıca metaplazi, gastrik atrofi gibi premalign lezyonlara neden olabilir. H. pilori ile midenin hiperplastik polipleri (HP) arasındaki ilişkiyi araştıran çalışmalar olmasına rağmen bu konudaki belirsizlik sürmektedir.

**Gereç ve Yöntem:** Sağlık Bilimleri Üniversitesi Gülhane Eğitim ve Araştırma Hastanesi Gastroenteroloji Kliniği Endoskopi Ünitesinde Ekim 2016 - Mart 2019 tarihleri arasında özofagogastroduodenoskopi yapılan 5378 hastanın verileri retrospektif olarak analiz edildi ve mide polibi saptanan olguların polip patolojileri ve normal mukoza biyopsileri değerlendirildi.

**Bulgular:** Ekim 2016 - Mart 2019 arasında verilerin retrospektif taramasında 49 hastada 61 adet mide polibi saptandı. Poliplerin 36'sı (%73) hiperplastik polipti. HP ile H. pilori varlığı, yaş, cinsiyet, polibin midedeki anatomik lokalizasyonu, boyutu, sayısı, metaplazi ve atrofi varlığı açısından istatistiksel olarak anlamlı fark gözlenmedi. H. pilori pozitif olgularda ortalama yaş ise istatistiksel olarak anlamlı şekilde daha düşük bulundu.

**Sonuç:** Sonuç olarak; hiperplastik polipler ile H. pilori varlığı arasında korelasyon gözlenmedi. HP ile H. pilori arasındaki ilişkiyi değerlendiren daha büyük sayıda, çok merkezli, prospektif çalışmalara ihtiyaç vardır.

**Anahtar Kelimeler:** Helikobakter Piloni, Hiperplastik, Mide, Polip

## INTRODUCTION

Marshall and Warren discovered the *Helicobacter pylori* (*H. pylori*) bacterium in 1983 (1). It is a gram-negative and urease positive, microaerophilic, spiral-shaped, and motile bacterium localized in the stomach and proximal duodenum (1-3).

The prevalence and incidence of *H. pylori* vary depending on age and the socioeconomic levels of countries. In developing countries, the frequency varies according to age, with 5% of patients between the ages of 0–5, 25% in their 30s, and around 50% aged 60 and over. The prevalence, which varies between 60–85% in developing countries, has declined to 10–30% in developed countries (4). The frequency of *H. pylori* is around 80% in Turkey (5).

*H. pylori* have been found to cause various diseases, such as chronic gastritis, peptic ulcers, peptic ulcer-related complications (gastrointestinal bleeding, perforation, gastric outlet obstruction), gastric cancer, and MALT lymphoma (6–10). It also causes precancerous cellular changes, such as metaplasia and atrophy in the gastric mucosa (11, 12). *H. pylori*'s relationship and coexistence with hyperplastic polyp (HP) formation, which is the most common gastric polyp and considered one of the premalignant lesions of the stomach despite its low probability, is not fully known.

We believe this study will help answer whether the polyps can regress with eradication treatment in the presence of the HP and *H. pylori* relationship or whether there will be recurrence after a polypectomy.

## MATERIAL AND METHODS

**Study Design:** This is a retrospective study evaluating data collected from patients who underwent esophagogastroduodenoscopy. The data were kept in the electronic database of the endoscopy unit and hospital information system at the University of Health Sciences Gulhane Training and Research Hospital Gastroenterology Clinic from October 2016–March 2019. An Olympus video gastroscope (Olympus GIF-Q150, Olympus Corporation; Tokyo, Japan) was used for all procedures.

The pathology of the polyp and the presence of *H. pylori*, metaplasia, and atrophy in the biopsies obtained from normal mucosa were recorded in the data form. Also, the patients' ages and genders and the anatomical locations, sizes, and number of polyps were recorded. After the

esophagogastroduodenoscopy procedure reports issued between October 2016 and March 2019 were reviewed, the data was recorded in the follow-up form, and the relationships between them were evaluated.

This study was approved by the local ethics committee (Ethics Committee Decision Number: 2019/19/122).

**Statistical Analysis:** Statistical Package for Social Sciences version 22 was used to evaluate the data obtained from the study. Continuous variables (quantitative variables) obtained by measurement were presented as a mean and standard deviation, and median and interquartile width, where necessary. Categorical variables (qualitative variables) were presented as frequency and percentage values. The Chi-square test and Fisher's exact test were used for statistical evaluation of the categorical variables. The quantitative variables used in the study were analyzed in terms of their conformity to a normal distribution using the Kolmogorov–Smirnov or Shapiro–Wilk test. In the statistical evaluation of intergroup differences in terms of the variable/variables of interest, one-way analysis of variance, and Tukey multiple comparison tests were used for normally distributed variables.

In contrast, the Kruskal–Wallis variance analysis and Bonferroni-corrected Mann–Whitney U tests were used for non-normally distributed variables. Correlations between normally distributed continuous variables were analyzed using the Pearson correlation analysis, while non-normally distributed variables were analyzed using the Spearman correlation analysis. The level of significance was set at  $p < 0.05$  in all statistical analyses.

## RESULTS

In the retrospective analysis, 61 gastric polyps were detected in 49 patients. Among these polyps, HPs were the most frequent, with 36 cases (73%). *H. pylori*'s positivity rate is 30.6% in all patients. In cases with a polyp size  $>8$  mm, *H. pylori*'s positivity was significantly higher ( $p = 0.034$ ). *H. pylori*'s positivity was not correlated with age, gender, location, size, number of polyps, or the presence of metaplasia and atrophy (Tables 1 and 2). In the HP subgroup, *H. pylori*'s positivity rate is 30.6%. *H. pylori*'s positivity was not correlated with gender, location, size, or number of polyps in the stomach, nor the presence of metaplasia and atrophy. However, the mean age was statistically significantly lower in cases positive for *H. pylori* ( $p = 0.032$ ) (Tables 3 and 4).

**Table 1.** Correlation between gastric polyp and H. pylori (gender, location, size, number, pathology, the presence of atrophy and metaplasia) (n:49)

Variables		H. pylori positive (n:13)		H. pylori negative (n:36)		P value
		N	(%)	n	(%)	
Gender	Female	8	(21.1)	30	(78.9)	0.106
	Male	5	(45.5)	6	(54.5)	
Location	Corpus	7	(35.0)	13	(65.0)	-
	Cardia	-	-	2	(100.0)	
	Fundus	1	(25.0)	3	(75.0)	
	Antrum	5	(21.7)	18	(78.3)	
Size	>8 mm	7	(46.7)	8	(53.3)	0.034
	1-8 mm	6	(17.6)	28	(82.4)	
Number	Multiple	4	(36.4)	7	(63.6)	0.402
	Single	9	(23.7)	29	(76.3)	
Pathology	Hyperplastic	11	(30.6)	25	(69.4)	0.288
	Other	2	(15.4)	11	(84.6)	
Atrophy	Yes	3	(27.3)	8	(72.7)	0.950
	No	10	(26.3)	28	(73.7)	
Metaplasia	Yes	4	(23.5)	13	(76.5)	0.729
	No	9	(28.1)	23	(71.9)	

**Table 2.** Correlation between gastric polyp and H. pylori (age and size) (n: 49)

Variables	H. pylori positive (n:13)		H. pylori negative (n:36)		P value
	Mean	SD	Mean	SD	
	Age (years)	57.2	7.2	61.1	
Size (mm)	11.1	7.3	6.3	3.6	0.009

SD, standard deviation

**Table 3.** Correlation between hyperplastic gastric polyp and H. pylori (gender, location, size, number, the presence of atrophy and metaplasia) (n:36)

Variables		H. pylori positive (n:11)		H. pylori negative (n:25)		P value
		N	(%)	N	(%)	
Gender	Female	7	(25.9)	20	(74.1)	0.409
	Male	4	(44.4)	5	(55.6)	
Location	Corpus	6	(50.0)	6	(50.0)	-
	Antrum	5	(22.7)	17	(77.3)	
	Cardia	-	-	1	(100.0)	
	Fundus	-	-	1	(100.0)	
Size	>8 mm	6	(50.0)	6	(50.0)	0.124
	1-8 mm	5	(20.8)	19	(79.2)	
Number	Multiple	3	(60.0)	2	(40.0)	0.154
	Single	8	(25.8)	23	(74.2)	
Atrophy	Yes	3	(37.5)	5	(62.5)	0.678
	No	8	(28.6)	20	(71.4)	
Metaplasia	Yes	4	(40.0)	6	(60.0)	0.454
	No	7	(26.9)	19	(73.1)	

**Table 4.** Correlation between hyperplastic gastric polyp and *H. pylori* (age and size) (n: 36)

Variables	H. pylori positive (n:11)		H. pylori negative (n:25)		P value
	Mean	SD	Mean	SD	
Age (years)	58.6	6.9	63.9	12.9	0.032
Size (mm)	11.4	7.9	7.0	3.9	0.061

SD, standard deviation

**DISCUSSION**

In the HP subgroup, the positivity of *H. pylori* was not correlated with gender, location, size, or the number of polyps in the stomach, nor the presence of metaplasia and atrophy; however, the positivity of *H. pylori* was significantly higher in cases with a polyp size >8 mm.

The incidence of polyps, one of the stomach's premalignant lesions, ranges from 0.6 to 6% (13, 14). Fundic gland polyps are more common in areas where the prevalence of *H. pylori* is low. In contrast, HPs are more prevalent in areas where the infection of *H. pylori* is more common (14, 15). However, the role of *H. pylori* in the formation of HPs is not fully known.

This study detected 49 cases of gastric polyps. Considering the correlation of *H. pylori* with parameters such as age, gender, location, size, number, pathology of the polyp, and the presence of metaplasia and atrophy, no difference was found in terms of age and gender. No difference was found in the non-polypoid gastric mucosa in terms of precancerous lesions, such as metaplasia and atrophy, in which *H. pylori* demonstrated a role in the etiology. A positive correlation was observed between the size of polyps and *H. pylori*. The positivity of *H. pylori* was significantly higher in the cases with polyp sizes greater than 8 mm. Although there is no correlation between the presence of polyp and *H. pylori* positivity,

according to this result, it can be concluded that *H. pylori* play a role in the growth of polyps. Gao et al found that *H. pylori*'s positivity rate is 31.7% in the patients with gastric polyps (16). In the recent studies, *H. pylori*'s positivity rates in the HPs are similar with the present study. Yu et al. and Hu et al. found that *H. pylori*'s positivity rates are 22.7% and 36.4%, respectively (17,18). Also, the study of Nam et al. showed that *H. pylori*'s eradication caused regression in HPs (19).

Considering the correlation of *H. pylori* with parameters such as age, gender, location, size, the number of polyps in the stomach, and the presence of metaplasia and atrophy in the HPs, the positivity of *H. pylori* was not correlated with the location, size, and the number of HPs or the presence of metaplasia and atrophy. The mean age was found lower only in cases positive for *H. pylori*, statistically. Rather than associating this result with HPs, the opinion of the researcher is that *H. pylori* are related to age distribution. In the literature, the findings on this subject are contradictory. The study by Horward and Pai (20) found no correlation between *H. pylori* and the location, number, size of HPs, and the presence of intestinal metaplasia; however, studies are reporting a correlation between HPs and *H. pylori* (21-23).

Our study has some limitations. This is a retrospective study with a small sample size. Furthermore, there is no long-term follow-up of the polyps. There is a need for more extensive, multi-centered, and prospective studies evaluating the correlation between HPs and the positivity of *H. pylori*, as well as the long-term response of polyps to the eradication therapy.

In conclusion, no correlation was found between the HPs and the positivity of *H. pylori*.

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