

Investigating The Relationship Between Gastric Polyp and Dyspepsia in Patients Referring to Taleghani Hospital During 2016-2018

Saeed Abdi¹, Elham Moradi², Zhale Mohsenifar³

1- Department of Pharmacology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

2- Student research committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

3- Anatomy and Biology Department, Medical Faculty, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

ARTICLE INFO

Date of acceptance: 28 August, 2020

Available Online: 5 September

KEYWORDS

Stomach, Polyps, Dyspepsia, Endoscopy, Dyspepsia, Helicobacter pylori.

CORRESPONDING AUTHOR

Elham Moradi

Department of Internal Medicine, Shahid Modarres Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Shahid Modarres hospital, Kaj Square, Saadat Abad, Tehran, Iran. Postal code: 1985717443

Phone: +98-912-131-8252

Email: leylabagheri90@gmail.com

ABSTRACT

Background and aims: Chronic dyspepsia is a common medical problem in patients referred to internal and gastrointestinal clinics. According to some studies, most patients with dyspepsia suffer simultaneously from gastric polyps. The current study aimed to clarify the association of gastric polyp and dyspepsia in an Iranian population.

Materials and methods: A total of 2772 dyspeptic and 1294 non-dyspeptic subjects who referred to the gastrointestinal clinical Ayatollah Taleghani Hospital in Tehran from 2016 to 2018 were enrolled in this cross-sectional study. All subjects underwent upper gastrointestinal (GI) endoscopy, and patients with GI malignancy, severe GI bleeding, and history of GI surgery were excluded from the study. Participants were evaluated for age, gender, endoscopic findings, gastric polyp (GP) count, size, and localization, diagnostic methods used for histology, and polyp features. The relationship between gastric polyp and dyspepsia was also evaluated.

Results: In 4066 consecutive upper GI endoscopies in patients with and without dyspepsia, 129 patients (3.2%) were found to have gastric polyps (GPs). The prevalence of GPs was 3.04% and 3.32% in subjects with and those without dyspepsia, respectively. There was no statistically significant relationship between GPs and dyspepsia ($p=0.709$). Hyperplastic polyp (HP) was the most common pathology in 53.5% and 34.9% of patients with and without dyspepsia, respectively. The most common location for polyps was the gastric antrum (76.7%), and the common size of the polyps was between 5-10 mm in 80.6% of patients.

Conclusion: In the present study, no statistically significant difference was observed in the pathologic findings of gastric polyps in terms of dyspepsia. Hyperplastic polyps (HPs) are the most common type of pathologic stomach polyps, and its prevalence maybe high due to the high frequency of Helicobacter pylori (H. pylori) infection in our country.

INTRODUCTION

Upper gastrointestinal symptoms, without explanatory organic or metabolic signs, called functional dyspepsia, which is one of the most common digestive disorders. The prevalence of this disease has estimated 10% to 30% in the world and in Iran country; this prevalence is between 2.2% and 29.9% [1-3]. This disorder observed more among individuals with a history of smoking, non-steroidal anti-inflammatory drug users, the people with Helicobacter pylori, and in

women. There are several pathophysiological mechanisms such as gastrointestinal motor abnormalities, visceral hypersensitivity, helicobacter infection, and excessive gastric acid secretion, contributing to this disease [4- 6].

Prevalence rates of gastric polyps (GPs) are variable around the world and have been found to be 0.33%–6.7% in various studies. These differences reflect regional etiologies or associations and seem to be increasing [7, 8]. GPs are usually asymptomatic, and >90% of polyps are coinci-



CITE THIS PAPER AS

Abdi S, Moradi E, Mohsenifar Z. Investigating the relationship between gastric polyp and dyspepsia in patients referring to Taleghani Hospital during 2016-2018. *Sch Med Stud J*.2020;2(2):9-15

TABLE 1. Characteristics and endoscopic findings of all participants

variable		All (n=4066)
Sex	Male n (%)	1941 (47.7)
	Female n (%)	2125 (52.3)
Age	Mean years (SD)	47.50±16.07
	Range	10 - 92
Age groups	≤ 20	114 (2.8)
	20-40	1392 (34.2)
	40-60	1567 (38.5)
	60-80	938 (23.1)
	>80	55 (1.4)
Smoking	Yes	965 (23.7)
	No	3101 (76.3)
Dyspepsia	Yes	2772 (68.2)
	No	1294 (31.8)
Gastric polyps (GPs)	Yes	129 (3.2)
	No	3937 (96.8)

dentally detected on esophagogastroduodenal endoscopy performed for other reasons. Large polyps may cause dyspepsia, bleeding, anemia, abdominal pain, or gastric outlet obstruction due to their localization [9]. Early diagnosis and management of gastric polyps is very important, because some polyps are prone to malignancy and most of them are usually asymptomatic [10]. Several studies investigating the association of dyspeptic symptoms with *H. pylori* infection or histological severity of gastritis have produced diverse results [11, 12]. The presence of *H. pylori* infection is closely related to chronic gastritis, which significantly increases the risk of developing dyspepsia, peptic ulcer, and GPs [13].

Due to the similar risk factors between dyspepsia and GPs, such as *H. pylori* infection, it was hypothesized that GPs may reflect the pathophysiological mechanisms of dyspeptic symptoms. The relationship between FD, *H. pylori* infection, and GPs is controversial. Some studies have been conducted on endoscopy findings in patients with and without dyspepsia, but the studies on polyp prevalence in both groups are not sufficient [14]. To clarify the relationship between GPs and dyspepsia, the current study investigated endoscopic appearances in patients with and without dyspepsia using upper GI endoscopy. The prevalence of GPs, demographic characteristics of patients with GPs, size, localization, features, and histopathological types of GPs in patients with and without dyspepsia were also determined.

MATERIALS and METHODS

Study design

This cross-sectional study was performed in the gastroin-

testinal clinic at Ayatollah Taleghani Hospital in Tehran during 2016-2018. Inclusion criteria were being a candidate for upper GI endoscopy. Patients with GI malignancy, severe GI bleeding, and history of GI surgery were excluded from the study. The indications of upper GI endoscopy were evaluated in each patient. The most common indication for upper GI endoscopy was dyspepsia. Based on the Rome III criteria, participants were classified into two groups: those with and those without dyspepsia. In addition, the definition of FD (according to Rome III criteria) included at least one of the following: bothersome postprandial fullness, early satiation, epigastric pain, and epigastric burning; patients had to have no evidence of structural disease that would likely explain their symptoms, including upper endoscopic findings. The patient must have met the criteria for 3 months, and the onset of symptoms must have been at least 6 months before diagnosis [15]. Other indications of upper GI endoscopy in patients without dyspepsia were dysphagia, odynophagia, nausea, vomiting, chronic anemia, iron deficiency, acute upper GI bleeding, acid reflux, Barrett esophagus, and portal hypertension. Upper endoscopies were performed for all patients after local anesthetic with Lidocaine 10% with the same endoscopic video (Olympus Optical Co, Ltd, GIF type V). From 5000 patients who underwent upper GI endoscopy, 4066 remained in the study, of whom 2772 were dyspeptic and 1294 were non-dyspeptic subjects. All subjects were evaluated for age; gender; endoscopic findings; gastric polyp (GP) count, size, and localization; diagnostic methods used for histology; and polyp features. The relationship between gastric polyp and dyspepsia was also evaluated. Written informed consent was obtained from all participants, and the Ethics Commit-

TABLE 2. Demographics characteristics and endoscopic findings in patients with and without dyspepsia

Dyspepsia				
Variables		With	Without	P-value
		(n=2772)	(n=1294)	
Age	Mean ± SD	15.84 ± 47.35	16.56 ± 47.82	0.38 ^a
	Range	10-92	14-89	
Sex	Male	(47.4) 1314	(48.5) 627	^a 0.53
	Female	(52.6) 1458	(51.5) 667	
Age group	20 ≥	(2.7) 74	(3.1) 40	[#] 1
	20-40	(34.4) 954	(33.8) 438	[#] 0.28
	40-60	(39.3) 1089	(36.9) 478	[#] 0.19
	60-80	(22.5) 625	(24.2) 313	[#] 0.61
Smoking	80 <	(1.1) 30	(1.9) 25	[#] 0.61
	Yes	(24.7) 684	(27.1) 281	^a 0.03
Gastric polyps	No	(75.3) 2088	(78.3) 1013	
	Yes	(3.1) 86	(3.3) 43	^a 0.709
	No	(96.9) 2686	(96.7) 1251	

*P-value <0.05 were considered as statistically significant, ^a Independent-samples T-test, [∞] Chi-square test, [#] one-way ANOVA

tee of the Research Institute approved the study for Gastroenterology and Liver Diseases, Shahid Beheshti University of Medical Sciences, Tehran, Iran (3642018.1.23/ع).

Polyp classification

For all gastric mucosa lesions, data on clinical and pathological features, such as number, size, location, features, and histopathological types of GPs, was obtained. All visible polyps were either biopsied or removed, thus identified and studied histologically by the pathologist group and classified as hyperplastic polyps (HPs), fundic gland polyps (FGPs), adenomatous polyps (APs), inflammatory fibroid polyps (Ifs), chronic gastric, or polypoidy. The locations of the polyps based on gastric areas were designated as antrum, body, fundus, or cardia areas. Polyp size was classified as small (< 5 mm), medium (5-10 mm), or large (> 10 mm) based on estimations made by comparing it with the opening size of the biopsy forceps. In patients with multiple polyps, the largest polyp was considered for size.

Statistical analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) 21.0 statistical package (Chicago, IL, USA), and a p-value <0.05 two tails was considered as statistically significant. Descriptive statistics are presented as percentages for qualitative variables and means and standard deviations (Mean $\pm$ SD) for continuous variables. Kolmogorov-Simonov's test was used to assess the normal distribution of the data. Categorical variables were compared by Pearson's chi-square test or Fisher's exact test, depending on the nature of the data.

Comparisons of continuous variables were conducted with student's t test. The patients were divided into 5 age groups ($\geq$ 20, 20-40, 40-60, 60-80, and $\leq$ 80 years). One-way ANOVA was used to compare the age groups in patients with and without dyspepsia and GPs.

RESULTS

Participant demographics and upper GI endoscopic findings

During the study period (2016-2018), 4066 persons met the inclusion criteria (candidates for upper GI endoscopy). The sample included 2125 (52.3%) women and 1941 (47.7%) men. The age range of patients was 10-92 years with a mean of 47.5 $\pm$ 16.07 years. According to the Rome III criteria, patients were divided into two groups, those with (2772; 68.2%) and those without (1294; 31.8%) dyspepsia. All patients underwent an upper endoscopy to determine the association between GPs in patients with and without dyspepsia; 129 patients (3.2%) had GPs, and 3937 (96.8%) patients were diagnosed without polyps based on GI endoscopy. Participant demographics and upper GI endoscopic findings are shown in Table 1.

Patient demographics and upper GI endoscopic findings

In this cross-sectional study, 2772 (68.2%) dyspeptic and 1294 (31.8%) non-dyspeptic subjects were enrolled. The mean age of patients with dyspepsia was 47.35 $\pm$ 15.84 years with a range of 10-92 years and 52.6% of patients were females. Among the 1294 patients without dyspepsia the mean age was 47.82 $\pm$ 16.56 years, with a range of 14-89 years and 51.5% of patients were females. There was no signifi-

TABLE 3. Demographics characteristics and endoscopic findings in patients with and without gastric polyps

Variables		Gastric polyps		P-value
		With (n=129)	Without (n=3937)	
Age	Mean $\pm$ SD	49.91 $\pm$ 13.28	47.42 $\pm$ 16.15	0.039 $^{\alpha}$ *
	Range	12-77	10-92	
Sex	Male	50 (38.8)	1891 (48)	0.038 $^{\infty}$ *
	Female	79 (61.2)	2046 (52)	
Age group	20 $\geq$	1 (8)	113 (2.9)	0.64 $^{\#}$
	20-40	33 (25.6)	1359 (34.5)	0.106 $^{\#}$
	40-60	63 (48.8)	1504 (38.2)	0.106 $^{\#}$
	60-80	32 (24.8)	906 (23)	1 $^{\#}$
	80 <	0	55 (1.4)	0.944 $^{\#}$
Smoking	Yes	33 (25.6)	932 (23.7)	0.616 $^{\infty}$
	No	96 (74.4)	3005 (76.3)	
Dyspepsia	Yes	86 (66.7)	2686 (68.2)	0.709 $^{\infty}$
	No	43 (33.3)	1251 (31.8)	

*P-value <0.05 were considered as statistically significant, α Independent-samples T-test, $^{\infty}$ Chi-square test, $^{\#}$ one-way ANOVA

cant difference in age or gender among patients with and without dyspepsia ($p>0.05$). Based on upper GI endoscopic results, 83 (3.1%) patients with dyspepsia and 43 (3.3%) patients without dyspepsia had GPs. There was no observed statistically significant relationship of GPs in patients with and without dyspepsia. The demographic characteristics and endoscopic findings of patients with and without dyspepsia are presented in Table 2. There was no statistically significant difference in the pathologic findings of patients with GPs in terms of dyspepsia (Table 4).

Upper GI endoscopic findings

The prevalence of GPs in this study was 3.17%, 3.04% and 3.32% in all participants, those with, and those without dyspepsia subjects, respectively. The frequency of gastric polyps was lower in patients with dyspepsia (3.04%) than in those without it (3.32%). Nevertheless, no statistically significant association was found between GPs and dyspepsia ($p=0.709$). The mean age of patients with GPs was 49.91 $\pm$ 13.28 years with a range of 12-77 years, and 61.2% of them were females. Among the 3937 patients without GPs, the mean age was 47.42 $\pm$ 16.15 years with a range of 10-92 years, and 52% of them were females. The mean age of patients with GPs was significantly higher than those without polyps ($p=0.039$). The frequency of GPs was significantly higher in females than in males ($p=0.038$). The demographics and endoscopic findings of patients with and without gastric polyps are presented in Table 3. The frequency rates of hyperplastic polyps (HPs), fundic gland polyps (FGPs), and adenomatous polyps (APs) were 47.3%,

20.8%, and 9.3%, respectively. The common size of the polyps was between 5-10 mm in 104 (80.6%) patients. In 112 (86.6%) patients, one polyp was found. The most common localizations of polyps were the antrum (76.7%) and the body (14.7%). Polypectomies were performed in 122 (94.6%) patients (Table 4).

DISCUSSION

A total of 4066 consecutive upper GI endoscopies performed at Taleghani Hospital in Tehran during the 2-year period from 2016 to 2018 were evaluated. Out of all patients who underwent endoscopy, 2772 (68.2%) and 1294 (31.8%) patients were with and without dyspepsia, respectively. The upper GI endoscopy of each patient was evaluated to find GPs. The results showed that 129 patients had GPs. The frequency of GPs in this study was 3.17%, 3.04%, and 3.32% in all participants, those with, and those without dyspepsia, respectively. The most frequent type of polyp was HP. In patients with and without dyspepsia, HP with the frequency of 53.5% and 34.9%, followed by FGPs with the frequency of 17.4% and 27.9% were the most frequent, respectively. Previous studies as well as the current research have shown that the great majority of polyps detected in the stomach were HPs, FGPs, and APs [7, 16-19].

The incidence of GPs greatly differs according to study populations and was found to be 0.33%–8% in various studies [7, 8, 16, 17, 20, 21]. Olmez et al. [7] found the incidence of GPs to be 0.34% in 56,300 upper GI endoscopies, and the frequency of HPs, APs, and FGPs were 88%, 2.6%, and 1.6%, respectively. In a case study by Velázquez-Dohorn

TABLE 4. characteristics of gastric polyps based on endoscopic findings

	variable	Dyspepsia		Total (n=129)	P-value
		Yes (n=83)	No (n=43)		
Polyps size	< 5 mm	14 (16.3)	5 (11.6)	19 (14.7)	0.784
	5-10 mm	68 (79.1)	36 (83.7)	104 (80.6)	
	>10 mm	4 (4.7)	2 (4.7)	6 (4.7)	
Polyps features	Sessile	80 (93)	40 (2.3)	120 (93)	0.083
	Pedunculated	3 (3.5)	1 (2.3)	4 (3.1)	
	Flat	2 (2.3)	2 (4.7)	4 (3.1)	
	Diminutive	1 (1.2)	0	1 (0.8)	
Polyps number	1	73 (84.9)	39 (90.7)	112 (86.8)	0.298
	2	12 (14)	4 (9.3)	16 (12.4)	
	3	1 (1.2)	0	1 (0.8)	
	Antrum	65 (75.6)	34 (79.1)	99 (76.7)	
Polyps location	Body	11 (12.8)	8 (18.6)	19 (14.7)	0.580
	Fundus	7 (8.1)	1 (2.3)	8 (6.2)	
	Cardiac	3 (3.6)	0	3 (2.3)	
	Hyperplastic	46 (53.5)	15 (34.9)	61 (47.3)	
Histopathology	Fundic gland	15 (17.4)	12 (27.9)	27 (20.8)	0.932
	Adenomatous	9 (10.5)	3 (7)	12 (9.3)	
	Inflammatory	8 (9.3)	2 (4.7)	10 (7.8)	
	Chronic gastritis	4 (4.7)	6 (13.9)	10 (7.8)	
Diagnostic methods	Polyploidy	4 (4.7)	5 (11.6)	9 (7)	0.583
	Polypectomy	82 (95.3)	40 (93)	122 (94.6)	
	Biopsy	4 (4.7)	3 (7)	7 (5.4)	

et al.[8] from Mexico in 2018, the prevalence of epithelial polyps was 4.93% in 3887 gastric biopsies, and the frequency of FGPs was higher than that of HPs and APs. A study by Ari et al.[16] from Turkey in 2016 reported the prevalence of gastric polyps in patients undergoing endoscopy to be between 1% and 8%. A study by Vatansever et al.[17] from Turkey found the prevalence of GPs to be 2.2% in 36,650 consecutive endoscopies. Carmack et al. [20] found the incidence of GP to be 6.35% in 121,564 endoscopic operations. The most frequent polyp type was FGPs, which accounted for 77% of all polyps; HPs and FHPs were 17% of all polyps. A study by Archimandritis et al. in Italy revealed the prevalence of GPs in patients undergoing endoscopy to be 1.2% [21]. Elhanafi et al.[22] reported that the most frequent polyp type was HP in 7090 endoscopic procedures. They concluded that it might be caused by increased H. pylori infection. According to the results of the studies, the prevalence of gastric polyps

in patients undergoing endoscopy is between 1.2% and 8%, and the current findings are within this range. HPs are most common in populations in which H. pylori infection is common [23]. In our country, according to recent studies that have shown a decrease in H. pylori prevalence in Iranian populations and the effectiveness of H. pylori eradication, the pathology of GPs in our country can be changed from HPs to FGPs [24, 25]. In countries where H. pylori infection is low, FGPs are more common [20]. In addition, the frequency of FGPs increases with the use of long-term proton-pump inhibitors (PPIs) [26]. The importance of GPs arises from the fact that some of them have malignant potential or are associated with some hereditary syndromes [9]. There is an increased risk of cancer in polyps other than FGPs and IFPs. While the risk of malignancy is low in HPs, malignant transformation is seen more frequently in APs. Due to their malignant potential and symptomatic nature, the treatment of

GPs is the complete removal of the polyps by endoscopic or surgical excision [9].

In the present study, the mean age of patients with gastric polyps (49.91 years) was significantly higher than that of non-polyp patients (47.42 years), and the frequency of gastric polyp was significantly higher ($p < 0.05$) in women (3.7%) than in men (2.6%). In a study performed by Fann et al. [27] in a Chinese population, the mean age was 54.7 years, 63% of patients were females, and 37% of patients were males. In a study by Velázquez-Dohorn et al [8], the mean age of patients was 58 years and 73% of them were females. In a study by Bilibou et al. in Romania in 2018, 41% of patients were male and 59% were female, and the mean age was 63 years old [28]. The current findings are consistent with the results of the studies of Velázquez-Dohorn et al. [8] and Bilibou et al. [28] in terms of frequency distribution of patients by gender; however, the average age of patients in the current study was lower than that in the mentioned studies.

The current study found no statistically significant difference within the pathologic findings of GPs in terms of dyspepsia. However, in some studies, the most common symptom in patients with GPs was dyspepsia [7]. Tahara et al. [14] investigated the association between dyspeptic symptoms and endoscopic appearances. In their study, the logistic regression analysis showed that friability in the antrum (OR= 3.90, 95% CI=1.20–12.64) and duodenal ulcer (DU) scarring (OR=3.41, 95% CI=1.08–10.79) were independently associated with dyspepsia. However, there was no statistically significant association between the severity of inflammatory tissue and glandular atrophy and dyspepsia. Nevertheless, further research is needed to clarify the association of GPs and dyspepsia in an Iranian population. It was ultimately attained that the GP frequency in the current study was 3.17%, 3.04%, and 3.32% in all participants, those with, and those without dyspepsia, respectively. The results showed no statistically significant difference within the pathologic findings of GPs in terms of dyspepsia. The most common type of gastric polyp was HP, followed by FG in both patient groups. The high frequency of HP may be due to the high rate of *H. pylori* infection in our country. However, by reducing *H. pylori* infection, the pathology of GPs in our country can be changed from HPs to FGPs. To reduce the probability of malignancy, we commend the removal of GPs with appropriate techniques and biopsy forceps or polypectomy.

REFERENCES

1. R, Suzuki H, Tack J, et al. Gastrointestinal Disorders. *Gastroenterology*. 2016;150(6):1380-92.
2. Mahadeva S, Goh KL. Epidemiology of functional dyspepsia: a global perspective. *World journal of gastroenterology*. 2006;12(17):2661-6.
3. Amini E, Keshteli AH, Jazi MS, Jahangiri P, Adibi P. Dyspepsia in Iran: SEPAHAN Systematic Review No. 3. *International journal of preventive medicine*. 2012;3(Suppl 1):S18-25.
4. Ford AC, Marwaha A, Sood R, Moayyedi P. Global prevalence of, and risk factors for, uninvestigated dyspepsia: a meta-analysis. *Gut*. 2015;64(7):1049-57.
5. Futagami S, Shimpuku M, Yin Y, Shindo T, Kodaka Y, Nagoya H, et al. Pathophysiology of functional dyspepsia. *Journal of Nippon Medical School = Nippon Ika Daigaku zasshi*. 2011;78(5):280-5.
6. Yarandi SS, Christie J. Functional Dyspepsia in Review: Pathophysiology and Challenges in the Diagnosis and Management due to Coexisting Gastroesophageal Reflux Disease and Irritable Bowel Syndrome. *Gastroenterology research and practice*. 2013;2013:351086.
7. Olmez S, Sayar S, Saritas B, Savas AY, Avcioglu U, Tenlik I, et al. Evaluation of patients with gastric polyps. *Northern clinics of Istanbul*. 2018;5(1):41-6.
8. Velazquez-Dohorn ME, Lopez-Durand CF, Gamboa-Dominguez A. Changing Trends in Gastric Polyps. *Revista de investigacion clinica; organo del Hospital de Enfermedades de la Nutricion*. 2018;70(1):40-5.
9. Goddard AF, Badreldin R, Pritchard DM, Walker MM, Warren B. The management of gastric polyps. *Gut*. 2010;59(9):1270-6.
10. Ugiagbe R, Omuemu C. Diagnostic indications for upper gastrointestinal endoscopy. *Annals of Biomedical Sciences*. 2012;11(2):65-70.
11. Vaira D, Holton J, Osborn J, D'Anna L, Romanos A, Falzon M, et al. Endoscopy in dyspeptic patients: is gastric mucosal biopsy useful? *The American journal of gastroenterology*. 1990;85(6):701-4.
12. Kyzekove J, Arlt J, Arltova M. Is there any relationship between functional dyspepsia and chronic gastritis associated with *Helicobacter pylori* infection? *Hepato-gastroenterology*. 2001;48(38):594-602.
13. Wang FW, Young SC, Chen RY, Lin KH, Chen YH, Hsu PI, et al. The Prevalence and Risk Factors of Gastric Polyp in Asymptomatic Patients Receiving Health Examination. *Gastroenterology research and practice*. 2018;2018:9451905.
14. Tahara T, Arisawa T, Shibata T, Nakamura M, Okubo M, Yoshioka D, et al. Association of endoscopic appearances with dyspeptic symptoms. *Journal of gastroenterology*. 2008;43(3):208-15.
15. Sorouri M, Pourhoseingholi MA, Vahedi M, Safaee A, Moghimi-Dehkordi B, Pourhoseingholi A, et al. Functional bowel disorders in Iranian population using Rome III criteria. *Saudi journal of gastroenterology : official journal of the Saudi Gastroenterology Association*. 2010;16(3):154-60.
16. Ari A, Buyukasik K, Segmen O. Polyps of the upper gastrointestinal tract: 10-year clinical experience and review of the literature. *Int J Clin Exp Med*. 2016;9(4):7339-42.
17. Vatansever S, Akpinar Z, Alper E, Ipek S, Yazicioglu N, Ekin N, et al. Gastric polyps and polypoid lesions: Retrospective analysis of 36650 endoscopic procedures in 29940 patients. *The Turkish journal of gastroenterology : the official journal of Turkish Society of Gastroenterology*. 2015;26(2):117-22.

18. Morais DJ, Yamanaka A, Zeitune JM, Andreollo NA. Gastric polyps: a retrospective analysis of 26,000 digestive endoscopies. *Arquivos de gastroenterologia*. 2007;44(1):14-7.
19. Garcia-Alonso FJ, Martin-Mateos RM, Gonzalez Martin JA, Foruny JR, Vazquez-Sequeiros E, Boixeda de Miquel D. Gastric polyps: analysis of endoscopic and histological features in our center. *Revista espanola de enfermedades digestivas : organo oficial de la Sociedad Espanola de Patologia Digestiva*. 2011;103(8):416-20.
20. Carmack SW, Genta RM, Schuler CM, Saboorian MH. The current spectrum of gastric polyps: a 1-year national study of over 120,000 patients. *The American journal of gastroenterology*. 2009;104(6):1524-32.
21. Archimandritis A, Spiliadis C, Tzivras M, Vamvakou-sis B, Davaris P, Manika Z, et al. Gastric epithelial polyps: a retrospective endoscopic study of 12974 symptomatic patients. *The Italian journal of gastroenterology*. 1996;28(7):387-90.
22. Elhanafi S, Saadi M, Lou W, Mallawaarachchi I, Dwivedi A, Zuckerman M, et al. Gastric polyps: Association with *Helicobacter pylori* status and the pathology of the surrounding mucosa, a cross sectional study. *World journal of gastrointestinal endoscopy*. 2015;7(10):995-1002.
23. Gencosmanoglu R, Sen-Oran E, Kurtkaya-Yapicier O, Avsar E, Sav A, Tozun N. Gastric polypoid lesions: analysis of 150 endoscopic polypectomy specimens from 91 patients. *World journal of gastroenterology*. 2003;9(10):2236-9.
24. Ashtari S, Pourhoseingholi MA, Molaei M, Taslimi H, Zali MR. The prevalence of *Helicobacter pylori* is decreasing in Iranian patients. *Gastroenterol Hepatol Bed Bench*. 2015;8(Suppl 1):S23-9.
25. Fakheri H, Saberi Firoozi M, Bari Z. Eradication of *Helicobacter Pylori* in Iran: A Review. *Middle East journal of digestive diseases*. 2018;10(1):5-17.
26. Jalving M, Koornstra JJ, Wesseling J, Boezen HM, S DEJ, Kleibeuker JH. Increased risk of fundic gland polyps during long-term proton pump inhibitor therapy. *Alimentary pharmacology & therapeutics*. 2006;24(9):1341-8.
27. Fan NN, Yang J, Sun G, Lu ZS, Ling Hu EQ, Wang XD, et al. Changes in the spectrum of gastric polyps in the Chinese population. *World journal of gastroenterology*. 2015;21(33):9758-64.
28. Bilibou M, Barboi O, Darie A, Khan A, Drug V. Gastric polyps precancerous conditions. *Endoscopy*. 2018;50(40):eP036.