Original Article

The necessity of gastric mucosal biopsy in dyspeptic patients with normal upper endoscopy in Modarres hospital 2017-2018

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Abstract

Background: Considering the diagnostic and therapeutic costs of patients with dyspepsia and the importance of diagnosis during gastrointestinal malignancies, in this study, we investigated the necessity of gastric mucosal biopsy in dyspeptic patients with normal upper endoscopy in Modarres hospital and their 6 months follow up. We studied their endoscopic biopsies changes and some of the involved risk factors this duration.

Materials and Methods: In this clinical trial study, 115 patients with dyspepsia, were referred from gastroenterology clinic of Modarres hospital during 2017-2018, were evaluated. Patients were enrolled in a study that did not have any ulcer and mass or deep mucosal lesion in the early endoscopy Surface erosions were no exception and could be included. Five biopsy samples were obtained from different stomach sites. After the pathology results, the patients who had malignancy reports, excluded from the study and other patients were treated with anti-acid drugs and, if necessary, eradicated *Helicobacter pylori*. After 6 months, they were again subjected to endoscopy and biopsies were taken. Data were analyzed by SPSS software version 22.

Results: The rate of *Helicobacter pylori* in patients with endoscopic dyspepsia without mucosal lesions after 6 months of treatment was reduced compared to pre-treatment $p<0.05$, 20.9% vs 12.2%. The severity of chronic gastritis mild to moderate in patients with endoscopic dyspepsia without mucosal lesions after 6 months of treatment was reduced compared to pre-treatment $p<0.05$, 89.6% vs 80%. There was a significant difference between metaplasia in patients with endoscopic dyspepsia without mucosal lesions before and 6 months after treatment $p<0.05$, 33%, vs 20%. Female gender, negative family history of GI cancer and not using alcohol were factors that significantly improved the results of biopsy chronic gastritis/ *H. pylori* /metaplasia after 6 months.

Conclusion: Regarding the reduction in the severity of chronic gastritis, *Helicobacter pylori* and metaplasia in this group of patients after 6 months of treatment, it is recommended that refraining from unnecessary follow-up and biopsy and imposing cost to the patient and the medical system and be limited to high-risk groups.

Keywords: Dyspepsia, Endoscopy, *Helicobacter pylori*, Chronic gastritis, Metaplasia

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Introduction

Dyspepsia is one of the most common complaints in clinical practice. Dyspepsia is generally defined as the recurrent epigastric pain and heartburn in conjunction with the feeling of reflux with or without bloating, nausea, and vomiting[1-4]. Dyspepsia is a prevalent symptom and can be caused by various factors

including: peptic ulcer disease, gastro-esophageal reflux disease (GERD), and malignancy. Dyspepsia is not along with a special symptom in some common cases and seems to be functional[5]. Functional dyspepsia is divided in to 4 classes in terms of the predominant symptoms: ulcer like, dysmotility like, GERD like and mixed type. In accordance with the latest Rome diagnostic criteria, four complaints among the above symptoms and complaints have been set to be the bases of diagnosis and division of dyspepsia, including: feeling tightness after meals, early satiety, abdominal pain and heartburn. Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis[6].

Dyspepsia is a common public problem. A literature review on various studies regarding the prevalence of dyspepsia in Europe has shown an incidence rate of 19-41%[7]. Another study in the United States with more limited diagnostic criteria indicated a 13% of incidence of this complication[8]. Sixty percent of patients referred to and examined for dyspepsia have no specific diseases like peptic ulcer, GERD and gastric cancer. Rather they are diagnosed with functional dyspepsia[9]. *Helicobacter pylori* (*H. pylori)* is an important bacterium which is well-known to be associated with duodenal or stomach ulcer, gastric malignancy and mucosa associated lympgoid tissue (MALT)[10,11].

Studies have shown that the highest delay time was related to the onset of GI symptoms until performing endoscopy at Iran, the highest delay was related to patients who were referred with a symptom of dyspepsia[12,13].

It is estimated that 25 to 40% of adults experience dyspeptic symptoms at least once in their lifetime. *H. pylori* is the most common cause of organic dyspepsia, and the majority of patients are classified as non-ulcer or functional dyspepsia, which is caused by a combination of motor disorders, visceral hypersensitivity, and non-adaptive psychological responses manifesting as gastrointestinal symptoms[14,15]. Moreover, *H. pylori* causes inflammation in the oxyntic cells and induced atrophic mucus, hence reducing the acid that itself a potential factor for cancer[16,17]. Due to the high incidence, rate and variety of causative agents, clinical evaluation and care of this discomfort have created a huge economic burden for different communities.

Empirical treatment approaches with acid reducing agents or *H. pylori* treatment have been effective in reducing endoscopy rate and reducing treatment costs, however endoscopy as a reliable way to reject the existence of gastric cancer, especially among patients who are having risk factors. Besides, about 30% of cases with normal endoscopic findings biopsies have abnormal patholic findings in reendoscopy. Furthermore, sometimes the blind sample that were taken from a regions may not be involve, which in this cases is reported as false negative[18]. At present, according to the AGA guideline, among patients with dyspepsia with a normal appearance of endoscopy with a strong recommendation and a very low quality of evidence, biopsy is advised not to be performed. On the other hand, sufficient evidence and desirable indications are not well specified for repeating endoscopy for follow-up among patients with dyspepsia[20].

Intestinal metaplasia has also been reported among 6 to 57% of the patients with normal gastro-esophageal junction in the upper endoscopy. Its ability to return to normal state was observed in the study by Goldstein. In this study, during 3-years follow up period, only 7% of metaplasia remained stable[19]. Taking into account this important issue and contradictory recommendations and findings, the researchers in this study examined the necessity of biopsy in upper endoscopy without mucosal lesions among patients with dyspepsia complaints and the necessity for follow up and the role of some of risk factors that effect on this changes[19].

Methods

After obtaining the necessary permissions for the implementation of the study ethic code: IR.SBMU.MSP.REC.1396.666, the study was carried out using the clinical trial method. This clinical trial study was performed on 115 patients the sample size was calculated based on Goldstein study from his formula[19].

$$[N = n1 + n2 = \frac{4\left(Z1 - \frac{a}{2} + Z1 - B\right)^2[(\frac{P1}{2} + \frac{P2}{2})(1 - \left(\frac{P1}{2} + \frac{P2}{2}\right))]}{(d = p1 - p2)^2}]$$

With dyspepsia who referred to the gastroenterology clinic of Modarres hospital diagnosis of dyspepsia was

based on patient complaints, Rome III and had indications of treatment in addition to absence the study exclusion criteria. The patients were placed under upper endoscopy and entered the study in case of the absence of clear and distinct mucosal lesions. In case of any deep lesion, mass, or ulcer, the patients were excluded from the study surface erosion was not an indication of exclusion. The study exclusion criteria included: having specific mucosal lesions, ulcers, mass, history of gastrointestinal malignancies, patients with a history of gastrointestinal and abdominal surgery, history of cardiovascular and pulmonary diseases patients with history of cardiovascular and pulmonary problems that were controlled by confirmation of cardiology or pulmonology consulting, were not exclusion criteria. Patients with bleeding disorder Platelets under 50000 and PTT above 50 , having a history of warfarin or any other anti-coagulant use, high-risk patients for sedation or anesthesia, patients with a history of allergy to anesthetics drug and pregnancy Any of the above is the criterion for exclusion from the study.

The informed consent was received from the patients and sufficient explanations on the diagnosis and treatment were provided to them. Then, the questionnaire for the evaluation of variables was completed and endoscopy was done for dyspeptic patients and biopsy was taken by a gastroenterologist five biopsy samples from random areas of small and large gastric curvature and peri-pyloric zone. The samples then were sent to the pathology department of Modarres hospital anonymously with a code assigned to the sample for histopathologic diagnosis and *H. pylori* examination single blind. Then, the medicines were required for improving dyspepsia symptoms, were prescribed for the patients including anti-acid, antihistamine, PPI, *H. pylori* eradication drugs in case of confirmation of infection. The patients were followed up monthly through phone call for general and gastrointestinal symptoms and were re-visited in case who were unimprovement or intensification of symptoms. After the end of the *H. pylori* treatment period, eradication was proven with UBT urease breath test or stool antigen. In case of reporting dysplasia or malignancy at the pathology stage, they were excluded from the study were referred to a surgeon or an oncologist; of 115 patients in the present study, there was no report of a dysplastic pathology or malignancy in the first pathology. Hence, the study continued with two groups of normal pathology and non-malignant pathology including metaplasia, chronic gastritis, and *H. pylori* infection. In the next step, the upper endoscopy was done at the same center Modarres hospital for follow up after nearly six months and the same pathologist reviewed the biopsies. The objective was to evaluate the patient's pathology changes during the 6-month follow-up period. The present study, was carried out aiming to investigate the effects of some variables that may be effect biopsies changes; including age, gender, body mass index BMI, duration of suffering from dyspepsia, family history of gastrointestinal malignancies, history of previously *H. pylori* infection, history of smoking and alcohol use, history of using drugs like steroids, ASA, nonsteroidal anti-inflammatory drugs NSAIDs, bisphosphonates and long-term antibiotics. On pathological changes pathology of metaplasia, gastritis and *H. pylori* infection in any endoscopy without mucosal lesions during treatment of dyspepsia in the next 6-month endoscopy surveyed.

The gathered data were analyzed by SPSS V22. Therefore, to compare qualitative variables in two and three group Chi-square or Fisher exact test was used. In addition, Wilcoxon test was used for comparison before and 6 months after treatment ($p<0.05$ was considered significant).

Results

In this study, 115 patients with dyspepsia who referred to the gastroenterology clinic of Modarres hospital during the year 2017-2018 who had criteria for entering the study and who did not have definite mucosal lesions, ulcer and mass in upper endoscopy ,were entered.

The age of the patients was between 23-85 years old with an average and standard deviation of 48.25±14.23 years. A total of 51.3% (n=59) of patients were female. Body mass index in 62 patients (53.9%) was normal (<25), 37.4% (n=43) was overweight 25-30, 9 patients (7.8%) was obesity class 1 obesity BMI: 30-30 and 1 patient (0.9%) was obesity class 2 BMI: 40-35. The duration of dyspepsia in 19 (16.5%) patients was less than 6 months, in 32 (27.8%) patients was between 6 months to 1 year, in 38 (33%) patients was between 1-

Table 1: Comparison of severity of chronic gastritis in patients with dyspepsia with endoscopic mucosal lesions before and 6 months after treatment.

Treatment time	Chronic gastritis			P_value
	No	Mild	Moderate	
Before	12 (10.4%)	79 (68.7%)	24 (20.9%)	<0.001
After	23 (20%)	80 (69.6%)	12 (10.4%)	

Table 2: Comparison of Helicobacter pylori in patients with dyspepsia with endoscopic mucosal lesions before and 6 months after treatment.

Treatment time	Helicobacter pylori		P_value
	No	Yes	
Before	91 (79.1%)	24 (20.9%)	0.018
After	101 (87.8%)	14 (12.2%)	

Table 3: Comparison of metaplasia pylori in patients with dyspepsia with endoscopic mucosal lesions before and 6 months after treatment.

Treatment time	Metaplasia		P_value
	No	Yes	
Before	77 (67%)	38 (33%)	0.002
After	90 (80%)	23 (20%)	

two year and in 26 (22.6%) was more than 2 years old. Ten patients (8.7%) had familial history of gastrointestinal malignancies. In 36 (31.3%) patients had a history of *Helicobacter pylori*. In 36 patients (31.3%) had a history of smoking. In 12 (10.4%) patients had a history of smoking. In 28 (24.3%) patients had history of using NSAIDs, in 16 (14%) patients had history of using aspirin, 6 (5.2%) patients had history of using alendronate and 1 (0.9%) patients had history of using corticosteroid.

There was a significant difference between the severity of chronic gastritis in patients with endoscopic mucosal dyspepsia before and 6 months after treatment ($p<0.05$). The severity of chronic gastritis in patients with endoscopic mucosal dyspepsia after 6 months of treatment was reduced compared to pre-treatment (Table 1).

There was a significant difference between the *Helicobacter pylori* in patients with endoscopic mucosal dyspepsia before and 6 months after treatment ($p<0.05$). The *Helicobacter pylori* in patients with endoscopic mucosal dyspepsia after 6 months of treatment was reduced compared to pre-treatment (Table 2).

There was a significant difference between the metaplasia in patients with endoscopic mucosal dyspepsia before and 6 months after treatment ($p<0.05$). The metaplasia in patients with endoscopic mucosal dyspepsia after 6 months of treatment was reduced compared to pre-treatment (Table 3).

Female, negative family history of gastrointestinal malignancies, negative history of alcohol abuse had a significant effect on the reduction of chronic gastritis after 6 months of treatment ($p<0.05$), but age, BMI, duration of dissection, previous history of *Helicobacter pylori*, history of smoking, and history of drug use had not significant effect on the downward trend of the severity of chronic gastritis after 6 months of treatment (Table 4).

Female, duration of dyspepsia under 1 year of age, negative family history of gastrointestinal malignancies, negative history of *Helicobacter pylori*, negative history of smoking and alcohol, and negative history of drug use had significant effect on the decreasing rate of *Helicobacter pylori* after 6 treatment was affected ($p<0.05$). However, age and BMI had not significant effect on the downward trend of *Helicobacter pylori* after 6 months of treatment (Table 5).

Female, BMI under 25, duration of dyspnea under 1 year of age, negative family history of gastrointestinal malignancies, negative history of *Helicobacter pylori*, negative history of smoking and alcohol, and negative history of drug use in patients on metaplasia was effective after 6 months of treatment ($p<0.05$). However, the patient's age did not effect on the

Table 4: Comparison of the severity of chronic gastritis in patients with endoscopic dyspepsia without mucosal lesions before and 6 months after treatment based on age, sex, BMI, duration of dyspnea, family history of gastrointestinal malignancies, history of Helicobacter pylori, history smoking and alcohol consumption and history of drug use.

Variable	Category	Treatment time	Chronic gastritis			P_value
			No	Mild	Moderate	
age (year)	<50	Before	10 (16.9%)	36 (61%)	13 (22%)	0.007
		After	15 (25.4%)	39 (66.1%)	5 (8.5%)	
	50=<	Before	2 (3.6%)	43 (76.8%)	11 (19.6%)	0.002
		After	8 (14.3%)	41 (73.2%)	7 (12.5%)	
Sex	Male	Before	7 (12.5%)	38 (67.9%)	11 (19.6%)	0.058
		After	10 (17.9%)	38 (67.9%)	8 (14.3%)	
	Female	Before	5 (8.5%)	41 (69.5%)	13 (22%)	<0.001
		After	13 (22%)	42 (71.2%)	4 (6.8%)	
BMI	<=25	Before	39 (66.1%)	15 (25.4%)	5 (8.5%)	0.002
		After	40 (67.8%)	8 (13.6%)	11 (18.6%)	
	25<	Before	40 (71.4%)	9 (16.1%)	7 (12.5%)	0.013
		After	40 (71.4%)	4 (7.1%)	12 (21.4%)	
duration of dyspepsia (years)	<=1	Before	34 (66.7%)	10 (19.6%)	7 (13.7%)	0.005
		After	32 (62.7%)	5 (9.8%)	14 (27.5%)	
	1<	Before	45 (70.3%)	14 (21.9%)	5 (7.8%)	0.005
		After	48 (75%)	7 (10.9%)	10 (16.9%)	
family history of gastrointestinal malignancies	Yes	Before	0 (0%)	8 (80%)	2 (20%)	0.317
		After	1 (10%)	8 (80%)	1 (10%)	
	No	Before	12 (11.4%)	71 (67.6%)	22 (21%)	<0.001
		After	22 (21%)	72 (68.6%)	11 (10.5%)	
previous history of Helicobacter pylori	Yes	Before	2 (5.6%)	26 (72.2%)	8 (22.2%)	0.007
		After	6 (16.7%)	27 (75%)	3 (8.3%)	
	No	Before	10 (12.7%)	53 (67.1%)	16 (20.3%)	0.003
		After	17 (21.5%)	53 (67.1%)	9 (11.4%)	
history of smoking	Yes	Before	4 (11.1%)	25 (69.4%)	7 (19.4%)	0.034
		After	9 (25%)	21 (58.3%)	6 (16.7%)	
	No	Before	8 (10.1%)	54 (68.4%)	17 (21.5%)	0.001
		After	14 (17.7%)	59 (74.7%)	6 (7.6%)	
history of alcohol	Yes	Before	0 (0%)	9 (75%)	3 (25%)	0.083
		After	2 (16.7%)	8 (66.7%)	2 (16.7%)	
	No	Before	12 (11.7%)	70 (68%)	21 (20.4%)	<0.001
		After	21 (20.4%)	72 (69.9%)	10 (9.7%)	
history of drug*	Yes	Before	8 (12.5%)	44 (68.8%)	12 (18.8%)	0.005
		After	16 (25%)	41 (64.1%)	7 (10.9%)	
	No	Before	4 (7.8%)	35 (68.6%)	12 (23.5%)	0.004
		After	7 (13.7%)	39 (76.5%)	5 (9.8%)	

* The above-mentioned drugs.

downward trend of metaplasia after 6 months of treatment (Table 6).

Discussion

Regarding the most important findings of the present study, the severity of chronic gastritis and the *H. pylori* and metaplasia rates, among dyspeptic patients without mucosal lesions in upper endoscopy, decreased in 6-month follow-up treatment in endoscopy biopsies compared to pre-treatment endoscopy biopsies.

In addition, the *H. pylori* rate among dyspeptic patients with normal endoscopy decreased after 6 months of treatment compared to before treatment ($p<0.05$), 20.9% vs 12.2%. The severity of chronic gastritis mild and moderate among dyspeptic patients without mucosal lesions decreased after 6 months of treatment compared to before treatment ($p<0.05$) 89.6% vs 80%. There was a difference in metaplasia rates among dyspeptic patients without mucosal lesions before and 6 months after treatment ($p<0.05$) 33% vs 20%. Gender women, duration of dyspepsia below one year, negative

Table 5: Comparison of Helicobacter pylori in patients with endoscopic dyspepsia without mucosal lesions before and 6 months after treatment based on age, sex, BMI, duration of dyspnea, family history of gastrointestinal malignancies, history of Helicobacter pylori, history Smoking and alcohol consumption and history of drug use.

Variable	Category	Treatment time	Helicobacter pylori		P_value
			No	Yes	
age (Year)	<50	Before	44 (74.6%)	15 (25.4%)	0.157
		After	48 (81.4%)	11 (18.6%)	
	50=<	Before	47 (83.9%)	9 (16.1%)	0.002
		After	53 (94.6%)	3 (5.4%)	
sex	Male	Before	45 (87.5%)	11 (19.6%)	0.058
		After	49 (87.5%)	7 (12.5%)	
	Female	Before	46 (78%)	13 (22%)	0.206
		After	52 (88.1%)	7 (11.9%)	
BMI	<=25	Before	47 (79.7%)	12 (20.3%)	0.059
		After	52 (88.1%)	7 (11.9%)	
	25<	Before	44 (78.6%)	12 (21.4%)	0.132
		After	49 (87.5%)	7 (12.5%)	
duration of dyspepsia (years)	<=1	Before	43 (84.3%)	8 (15.7%)	0.005
		After	44 (86.3%)	7 (13.7%)	
	1<	Before	48 (75%)	16 (25%)	0.013
		After	57 (89.1%)	7 (10.9%)	
family history of gastrointestinal malignancies	Yes	Before	8 (80%)	2 (20%)	1
		After	8 (80%)	2 (20%)	
	No	Before	83 (79%)	22 (21%)	0.012
		After	93 (88.6%)	12 (11.4%)	
previous history of Helicobacter pylori	Yes	Before	27 (75%)	9 (25%)	0.096
		After	32 (88.9%)	4 (11.1%)	
	No	Before	64 (81%)	15 (19%)	0.096
		After	69 (87.3%)	10 (12.7%)	
history of smoking	Yes	Before	27 (75%)	9 (25%)	0.317
		After	30 (83.3%)	6 (16.7%)	
	No	Before	64 (81%)	15 (19%)	0.02
		After	71 (89.9%)	8 (10.1%)	
history of alcohol	Yes	Before	10 (83.3%)	2 (16.7%)	0.317
		After	11 (91.7%)	1 (8.3%)	
	No	Before	81 (78.6%)	22 (21.4%)	0.029
		After	90 (87.4%)	13 (12.6%)	
history of drug	Yes	Before	53 (82.8%)	11 (17.2%)	0.414
		After	55 (85.9%)	9 (14.1%)	
	No	Before	38 (74.5%)	13 (25.5%)	0.021
		After	46 (90.2%)	5 (9.8%)	

family history of gastrointestinal malignancies, negative history of *H. pylori*, negative history of smoking and not using alcohol, and lack of history of drug use among patients were effective on the decreasing rate of *H. pylori* after 6 months of treatment ($p<0.05$). However, age and BMI did not affect the decreasing rate of *H. pylori* after 6 months of treatment. Moreover, gender women, negative family history of gastrointestinal malignancies, and lack of history of using alcohol was effective on decreasing trend of chronic gastritis after 6 months of treatment ($p<0.05$). However, the age, BMI, duration of dyspepsia, history of *H. pylori*, history of smoking, and history of drug use among patients did not affect the reduction in the severity of chronic gastritis after 6 months of treatment.

Furthermore, gender women, BMI less than 25, duration of dyspepsia under 1 year, negative family history of gastrointestinal malignancies, negative history of *H. pylori*, lack of history of smoking and alcohol consumption, and negative history of drug use among patients were effective on decreasing metaplasia after 6 months of treatment ($p<0.05$). However, the age of patients did not affect the decreasing trend of

Table 6: Comparison of metaplasia in patients with endoscopic dyspepsia without mucosal lesions before and 6 months after treatment based on age, sex, BMI, duration of dyspnea, family history of gastrointestinal malignancies, history of Helicobacter pylori, history Smoking and alcohol consumption and history of drug use.

Variable	Category	Treatment time	Metaplasia		P_value
			No	Yes	
age (year)	<50	Before	44 (74.6%)	15 (25.4%)	0.021
		After	52 (88.1%)	7 (11.9%)	
	50=<	Before	33 (58.9%)	23 (41.1%)	0.035
		After	40 (71.4%)	16 (28.6%)	
sex	Male	Before	43 (76.8%)	13 (23.2%)	0.109
		After	49 (87.5%)	7 (12.5%)	
	Female	Before	34 (57.6%)	25 (42.4%)	0.003
		After	43 (72.8%)	16 (27.2%)	
BMI	<=25	Before	38 (64.4%)	21 (35.6%)	0.013
		After	47 (79.7%)	12 (20.3%)	
	25<	Before	39 (69.6%)	17 (30.4%)	0.058
		After	45 (80.4%)	11 (19.6%)	
duration of dyspepsia (years)	<=1	Before	37 (72.5%)	14 (27.5%)	0.414
		After	39 (76.5%)	12 (23.5%)	
	1<	Before	40 (62.5%)	24 (37.5%)	0.002
		After	53 (82.8%)	11 (17.2%)	
family history of gastrointestinal malignancies	Yes	Before	8 (80%)	2 (20%)	0.564
		After	9 (90%)	1 (10%)	
	No	Before	69 (65.7%)	36 (34.3%)	0.002
		After	83 (79%)	22 (21%)	
previous history of Helicobacter pylori	Yes	Before	22 (61.1%)	14 (38.9%)	0.058
		After	28 (77.8%)	8 (22.2%)	
	No	Before	55 (69.6%)	24 (30.4%)	0.013
		After	64 (81%)	15 (19%)	
history of smoking	Yes	Before	30 (83.3%)	6 (16.7%)	0.317
		After	33 (91.7%)	3 (8.3%)	
	No	Before	47 (59.5%)	32 (40.5%)	0.001
		After	59 (74.7%)	20 (25.3%)	
history of alcohol	Yes	Before	10 (83.3%)	2 (16.7%)	0.317
		After	11 (91.7%)	1 (8.3%)	
	No	Before	67 (65%)	36 (35%)	0.003
		After	81 (78.6%)	22 (21.4%)	
history of drug	Yes	Before	45 (70.3%)	19 (29.7%)	0.083
		After	51 (79.7%)	13 (20.3%)	
	No	Before	32 (62.7%)	19 (37.3%)	0.007
		After	41 (80.4%)	10 (19.6%)	

metaplasia after 6 months of treatment.

Gender, negative family history of cancer, and negative alcohol use were three variables that improved all three biopsies pathology chronic gastritis, *H. pylori*, and metaplasia after 6 months with significant p value. Other variables had significant changes on one or two of these three pathologies after 6 months of follow up.

Based on the literature review conducted by the researchers in the present study, no study has been carried out using the method exploited in this study. Of course, it has been reported in many previous studies that PPI consumption can be effective in reducing dyspepsia symptoms[20]. In a study by Yalçin et al, according to the results similar to those obtained in the present study, it was found that the rate of recurrence of H. pylori infection decreased among patients with dyspepsia treated with *H. pylori* eradication based on the upper endoscopy after 6 months[22]. In a study by Kim et al, in results consistent with those of the present

study, gender and BMI were stated to be the predictive of the recovery of patients with dyspepsia after 1 year of *H. pylori* eradication therapy. However, the age of patients was not predictive of significance in line with the present study. Therefore, eradication of *H. pylori* was the only important factor in the recovery of patients with dyspepsia after one year[23]. Results of the study performed by Mansour-Ghanaei et al, were in agreement with the present study; these results indicated that the incidence rate of *H. pylori* infection based on endoscopy among patients with dyspepsia was decreased after 10 weeks and 1 year. In addition, the rate of recurrence of *H. pylori* was 5% after one year of treatment [24]. In a study by Tirgar Fakheri et al in line with the results of the present study, it was revealed that the incidence of *H. pylori* based on endoscopy in patients with duodenal ulcer was reduced after 2 years of successful treatment as the present study. In spite of the successful initial treatment and eradication of *H. pylori*, recurrence rate of *H. pylori* infection is high. This can affect the treatment strategy and follow-up of patients[25]. In the study by Gunaid et al, in results similar to those obtained in the present study, the incidence rate of *H. pylori* infection based on endoscopy among patients with dyspepsia were treated with eradication was 82.2% at the onset of treatment and the recurrence rate of *H. pylori* was 34% after one year. Of course, the recurrence rate of *H. pylori* is high after one year, which can be due to the large resistance of bacteria resulting from unlimited use of antibiotics[26]. In a study by Kamada et al, was in line with the present study, it was stated that the *H. pylori* rate was reduced and dyspeptic symptoms were improved after 3 years of *H. pylori* eradication treatment among patients with dyspepsia based on endoscopy[27]. In a study by Kyzekove et al, results of which were consistent with those of the present study, it was found that based on the endoscopy in patients with dyspepsia, there was a significant reduction in gastritis intensity and *H. pylori* levels after 6 months of treatment. However, there was no decrease in the metaplasia rate in contrast to the present study, hence, eradication therapy improved inflammatory changes and dyspepsia symptoms. The morphologic changes of the gastric mucosal lesions were significantly associated with dysmotility symptoms[28]. In the study by Goldstein, endoscopy was performed on 85 patients with metaplasia pathology and they were undergoing annual biopsy under follow-up. Finally, it was concluded that sustained metaplasia remained only in 7% of cases consistent with the present study[19]. In the study by LEUNG in a 7-year investigation; it was revealed that the risk of progression of metaplasia to cancer has been reduced with *H. pylori* eradication. This study showed a significant relationship between metaplasia with age over 45 years in contrast to the present study and alcohol consumption similar to the present study[29]. In the study by Felley et al, regarding examination of the factors influencing the progression of cardiac metaplasia, there was no significant difference in terms of gender in the Mary Barrett group unlike the present study, which was higher among women; metaplasia was observed in 42% of patients. In this study, age, smoking, and BMI had a strong relationship with metaplasia similar to the present study; however, *H. pylori*, in contrast to the present study, did not show a significant relationship with GERD[30].

Being as a clinical trial was one of the strengths of this study, though the study was along with some limitations. These limitations included presence of few similar studies and the limited possibility of comparison of this study with other studies. Therefore, it is recommended that future studies similar to the present study be designed, relatively low sample size in this study and hence, the insignificant differences before and after treatment. Therefore, future studies are recommended to be designed with higher sample size.

Unfortunately, despite attempting to examine all biopsies by one pathologist, due to the lack of access to him, some of the samples were reported by other pathologists. Due to the difficulty in coordinating the referral for second endoscopy, in some cases, intervals were less or more than six months. In addition, adequate information on the correct use of medications was not available. Finally, it seems that the severity of chronic gastritis, *H. pylori* rate, and metaplasia among patients with dyspepsia, endoscopy and without mucosal lesions decreased after 6 months of treatment compared to pre-treatment. Moreover, gender, negative family history of gastrointestinal malignancies, and negative history of alcohol consumption in patients were associated with a reduction in the severity of chronic gastritis after 6 months of treatment. Age, gender, BMI, duration of

dyspepsia, negative family history of gastrointestinal malignancies, negative history of *H. pylori*, negative history of smoking and alcohol, and no history of drug use of patients were effective on the *H. pylori* rate after 6 months of treatment. Furthermore, gender, BMI, duration of dyspepsia, negative family history of gastrointestinal malignancies, no history of *H. pylori*, negative history of smoking and alcohol, and negative history of drug use were effective on the rate of metaplasia after 6 months of treatment. Regarding the number of chronic gastritis 103 cases *H. pylori* 24 cases, and metaplasia 38 cases, respectively, report of a relatively benign pathology among patients with normal endoscopy, despite the absence of definitive endoscopic lesion, is routinely common. This sometimes imposes medical treatment costs and numerous supplementary procedures, many of which disappear in endoscopy follow-up and are not reported. Performing biopsy may be limited among patients with normal appearance, and only be conducted among a specific group with restricted risk factors.

Conclusion

Regarding the reduction in the severity of chronic gastritis, *Helicobacter pylori* and metaplasia in patients with endoscopic mucosal endoscopy after 6 months of treatment, it is recommended that refraining from unnecessary follow-up and biopsy and imposing cost to the patient and the system of treatment and be limited to high-risk groups.

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