

Analysis of *Helicobacter pylori* positiveness and upper gastrointestinal system endoscopy results of Yozgat region in Turkey

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ABSTRACT

Aims: The aim of this study is to analyze the endoscopy and pathology results of patients who underwent endoscopy in Yozgat region, to determine the frequency of *Helicobacter pylori* (*H. pylori*) positivity and to compare the results with the data in the literature.

Material and Method: Among the patients who applied to our clinic for any reason between 01/01/2019 and 31/12/2019, 772 patients who underwent upper gastrointestinal system endoscopy were included in the study and analyzed retrospectively.

Results: The mean age of the patients was 50±16.78 (16–89). 61.3% (n=473) of the patients were female; 38.7% (n=299) were male. When gastroscopic diagnoses were evaluated, the rate of patients reported as "normal upper gastrointestinal endoscopy" was found to be 5.2% (n=40). The most frequently reported diagnosis was "nonerosive gastritis" with a rate of 59.2% (n=457). Biopsy was obtained in 646 of 772 patients. The most common diagnosis was reported as "chronic active gastritis" with 90.6% (n=585). 626 of the patients had *H. pylori* pathological evaluation results. While 18.7% (n=117) of the patients were found to be *H. pylori* negative, 81.3% (n=509) were found to be *H. pylori* positive. Stomach cancer was found to be 1.3% (n=9) and esophageal cancer was found to be 0.1% (n=1).

Conclusion: In the Yozgat region, the frequency of *H. pylori* positivity was found to be 81.3%, and it is often mildly (+) positive. In addition, the frequency of *H. pylori* positivity was similar between men and women, consistent with the literature. The most common diagnosis was reported as "chronic active gastritis". While stomach cancer was detected at a rate of 1.3%, esophageal cancer was found at a rate of 0.1%.

Keywords: Upper gastrointestinal endoscopy, *Helicobacter pylori*, histopathology, gastric cancer, esophageal cancer

INTRODUCTION

Upper gastrointestinal endoscopy (Esophago-gastroduodenoscopy) is the most reliable diagnostic method widely used in the diagnosis of esophageal, stomach and proximal duodenal diseases. The advantage of endoscopy is to see the inner surface of the organ directly, to perform pathological sampling from the lesions, and to apply endoscopic treatment when necessary. For treatment purposes, interventional procedures such as excision of the polyp, control of upper and lower gastrointestinal system bleeding (esophageal varices bleeding, sclerotherapy, coagulation), and removal of foreign bodies can be performed (1).

The most common symptoms of upper gastrointestinal system diseases can be detected as dysphagia, dyspepsia,

nausea and vomiting, retrosternal burning, epigastric pain, bleeding, and weight loss. These symptoms may indicate a benign or malignant condition. Therefore, patients with these symptoms should be evaluated with endoscopy (2,3).

H. pylori is a frequently encountered gram-negative pathogenic bacterium that affects almost half of the world population (4). *H. pylori* is implicated as an important pathogen in some diseases; chronic gastritis, peptic ulcer, nonulcer dyspepsia, gastric carcinoma and MALT lymphoma are the main ones (5). It is estimated that 50-90% of the world population is infected with *H. pylori* (6,7).

H. pylori is a human pathogen that is transmitted from person to person and causes chronic active gastritis (of varying severity) in all colonized subjects. *H. pylori* gastritis is considered an infectious disease regardless of the symptoms of the individual and the stage-complications of the disease (8). In 1994, when the World Health Organization International Agency for Research on Cancer concluded that *H. pylori* is a definite carcinogen in humans, attention was focused on this bacterium (9). The need for endoscopy is increasing due to increasing gastrointestinal malignancies, increased frequency of *H. pylori* and widespread screening programs.

The gold standard for the diagnosis of *H. pylori* is the histopathological examination of the samples taken by gastroscopic biopsy and the demonstration of the bacterium by culture (10,11).

In this study, we aimed to retrospectively determine and present the frequency of esophageal, stomach and proximal duodenum diseases and the frequency of *H. pylori* in endoscopic biopsy samples, and its relationship with age and gender in patients admitted to a tertiary hospital and undergoing upper gastrointestinal system endoscopy.

MATERIAL AND METHOD

The study was carried out with the permission of Yozgat Bozok University Clinical Research Ethics Committee (Date: 14.04.2021, Decision No: 2017-KAEK-189_2021.04.14_04). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

In our study, 772 patients who underwent upper gastrointestinal endoscopy for any reason in the endoscopy unit of a tertiary hospital between 01/01/2019 and 31/12/2019 were retrospectively analyzed. The patients' endoscopy reports, tissue biopsy pathology reports and other information were obtained from hospital records.

It was observed that all endoscopic procedures were performed under pharyngeal local anesthesia and sedated anesthesia (propofol i.v.) after 8 hours of fasting. The age, gender and esophagus, stomach and proximal duodenum findings in the endoscopy reports of the patients were determined.

Biopsy preparations taken for *H. pylori* and histopathological diagnosis were stained with hematoxylin-eosin and modified giemsa and examined under light microscopy, and reported as (+) mild, (++) moderate, (+++) severe positive according to the bacterial density in the preparations. It was observed that PNL activation, Hp activity, chronic inflammation, intestinal metaplasia, presence of atrophy were graded according to Sydney classification (Table 1) (12). It was observed that more advanced staining and techniques were used in malignant cases. Pathological data were obtained from these reports.

Statistical Analysis

SPSS version 20.0 (Statistical Package for Social Sciences) program was used for statistical analysis of the findings. Descriptive statistics were used in the analysis of the data. While continuous variables were expressed as mean±standard deviation (SD), nominal variables were expressed as percentages. Chi-square test and Mann-Whitney U test were used to evaluate the relationship between groups. P value <0.05 was considered statistically significant.

RESULTS

When the retrospective files were scanned, it was determined that 772 patients underwent upper gastrointestinal endoscopy between 01/01/2019 and 31/12/2019. The mean age of the patients was 50±16.78 (16–89). 61.3% (n=473) of the patients were female; 38.7% (n=299) were male.

When gastroscopic diagnoses were evaluated, the rate of patients reported as "normal upper gastrointestinal endoscopy" was found to be 5.2% (n=40). The most

Table 1. Sydney Classification (11)

Feature	Definition	Garding guidelines
Chronic inflammation	Increased lymphocytes and plasma cells in the lamina propria	Mild, moderate, or severe increase in density
Activity	Neutrophilic infiltrates of the laminapropria, pits, or surface epithelium	Mild: < 1/3 of pit and surface infiltrated Moderate: 1/3 - 2/3 of pit and surface infiltrated Severe: > 2/3 of pit and surface infiltrated
Atrophy	Loss of specialized glands from either antrum or corpus	Mild: mild loss Moderate: moderate loss Severe: severe loss
Intestinal metaplasia	Intestinal metaplasia of the epithelium	Mild: < 1/3 of mucosa involved Moderate: 1/3 - 2/3 of mucosa involved Severe: > 2/3 of mucosa involved
<i>Helicobacter pylori</i>	Density of <i>H. pylori</i> overlying epithelium	Mild: scattered organism covering < 1/3 of surface Moderate: intermediate numbers Severe: large cluster or a continuous layer over > 2/3 of surface

frequently reported diagnosis was “nonerosive gastritis” with a rate of 59.2% (n=457). Gastric ulcer rate was 6% (n=46); duodenal ulcer rate was found to be 2.3% (n=17). A mass lesion suggesting malignancy in the stomach was found to be 1.3% (n=10). Esophagitis was reported as 23.4% (n=181), varicose veins in the esophagus 0.8% (n=6) and a mass lesion suggesting malignancy in the esophagus was reported as 0.1% (n=1) (Table 2).

Table 2. Diagnoses, patient numbers and rates reported in upper gastrointestinal endoscopy

Endoscopic Diagnoses	Number of patients (n)	Patient ratio (%)
Normal Endoscopy	40	5.2
Nonerosive Gastritis	457	59.2
Pangastritis	44	5.7
Erosive Gastritis	42	5.4
Alkaline Reflu Gastritis	49	6.3
Gastric Ulcer	46	6
Gastric Malignant Mass Lesion	10	1.3
Gastric Polyp	14	1.8
Bulbit	33	4.3
Duodenal Ulcer	17	2.2
Esophagitis	181	23.4
Lower Esophageal Sphincter Slackness	178	23
Hiatal Hernia	11	1.4
Esophageal Varicose	6	0.8
Esophageal Diverticulum	1	0.1
Esophageal Malignant Mass Lesion	1	0.1
Inlet Patch	10	1.3

When the pathological diagnoses were examined, it was determined that biopsy was taken in 646 of 772 patients. The most common diagnosis was reported as “chronic active gastritis” with 90.6% (n=585). It was observed that chronic atrophic gastritis was reported with a rate of 4.8% (n=31). Gastric adenocarcinoma rate was 1.2% (n=8), neuroendocrine tumor rate was 0.1% (n=1), and esophageal squamous cell cancer rate was 0.1% (n=1) (Table 3).

Table 3. Reported pathological diagnoses, patient numbers and rates

Endoscopic Diagnoses	Number of patients (n)	Patient ratio (%)
Chronic Active Gastritis	585	90.6
Chronic Atrophic Gastritis	31	4.8
Stomach Adenocarcinoma	8	1.2
Gastric Neuroendocrine Tumor	1	0.1
Hyperplastic adenoma	8	1.2
Tubular Adenoma	2	0.2
Tubulovillous Adenoma	1	0.1
Xanthelasma	1	0.1
Esophageal Columnar Metaplasia	2	0.2
Squamous Cell Carcinoma of the Esophagus	1	0.1
Celiac Disease	2	0.2

626 of the patients had *H. pylori* pathological evaluation results. While 18.7% (n=117) of the patients were found to be *H. pylori* negative, 81.3% (n=509) were found to be *H. pylori* positive. The rates of positivity degrees according to Sydney Classification in *H. pylori* positive patients are given in Table 4.

Table 4. Rates of *Helicobacter pylori* positivity according to Sydney classification

Degree of Positivity	Number of patients (n)	Rate of patients (%)
<i>Helicobacter pylori</i> +1	379	74.5
<i>Helicobacter pylori</i> +2	103	20.2
<i>Helicobacter pylori</i> +3	27	5.3

When the relationship between *H. pylori* status and gender was examined, it was found that there was no significant relationship (p=0.595). When the relationship between *H. pylori* status and age was examined, it was found that there was no significant relationship (p=0.195).

When metaplasia was examined, metaplasia was found in 8.6% (n=53) of 615 patients. When atrophy was examined, it was found that 16.3% (n=100) of 613 patients had atrophy.

DISCUSSION

In addition to the use of upper gastrointestinal endoscopy for diagnostic purposes in esophagus, stomach and proximal duodenal diseases, its therapeutic use is becoming widespread with the development of therapeutic endoscopes.

Esophageal cancer is the 8th most common cancer in the world and ranks 6th in cancer-related deaths (13). Esophageal cancers are more common in developing countries and these cancers are usually detected at an advanced stage (inoperable period). Esophageal cancer is more common in males. According to 2013 statistical data in Turkey, the incidence of esophageal cancer is 1.3 per hundred thousand in women and 2.1 per hundred thousand in men (14).

In studies conducted in our country, the incidence of esophageal cancer shows regional differences. Esophageal cancer was detected in 4.3% of the patients who underwent endoscopy in the study conducted in the Van basin in the Eastern Anatolia Region. 61% of the patients were women and 39% were men, and esophageal cancer was 1.5 times more common in women than in men. The mean age was determined as 54.7 (15). In a study conducted in the Harran Region, the incidence of esophageal cancer was found to be 0.2% in a series of 5286 patients (16). In a study evaluating 6912 upper gastrointestinal endoscopy performed in the Elazig region, esophageal cancer was reported as 0.1%.

In a study conducted in the Western Black Sea Region, the rate of esophageal cancer was reported as 0.06% in 7703 patients who underwent upper gastrointestinal endoscopy (17). In a study conducted in Aydın Region, upper gastrointestinal malignancy was detected with a rate of 2.71% in endoscopic examinations (18). In our study, the detection rate of esophageal cancer in the Yozgat Region was found to be 0.1% (n=1).

While gastric cancer is the fourth most common type of cancer in the world, it ranks third in cancer-related deaths (19). Gastric cancer is the most common type of cancer in women after breast and colorectal cancers in our country. In men, it is the most common type of cancer after lung cancer. In general, it occurs twice as often in men than in women. The average age of occurrence is between 60-70 years (20,21). The incidence of gastric cancer in our country varies between 0.5-4% (17). In a study involving 504 gastric cancers in Erzurum Region, 36.1% of gastric cancer patients were female and 63.9% male, and the mean age of the patients was 62.4 years (22). In a study conducted in the Elazığ Region, gastric cancer was detected with a rate of 1.3% in upper gastrointestinal endoscopy (17). In a study conducted in the Harran Region, the frequency of gastric cancer was found to be 0.5% in a series of 5286 patients (16). Gastric cancer in the Van Region was found 1.6 times more frequently in men than in women. The mean age of the cases was 54.8, and it was most common between the ages of 51-60 (39%) (15). In our study, the incidence of gastric cancer was 1.3% (n=9) in 772 patients who underwent upper gastrointestinal endoscopy. The findings are similar to the literature. Gastric adenocarcinoma was detected in 8 patients, and gastric neuroendocrine tumor was detected in 1 patient.

There are various diagnostic methods used in the detection of *H. pylori* infection. These methods are divided into invasive methods that require endoscopic gastric mucosal biopsy and noninvasive methods that do not require endoscopy. Invasive tests; culture, histopathological test, rapid urease test and PCR. Noninvasive tests consist of Urea breath test, serological tests and *Helicobacter pylori* antigen in stool (10,11).

In studies conducted in different regions of Turkey and on different dates, it has been reported that the frequency of *H. pylori* is found to be between 43-88.6%, the frequency varies between regions and age groups, and tends to decrease with age in recent years (23-37). Özardalı et al. (28) in 1998, Uyanıkoğlu et al. (24) in 2012, in their study covering the Şanlıurfa region and including cases with different endoscopic diagnoses; reported *H. pylori* positivity as 89.8% and 71%, respectively. Konakçı et al. (23) found *H. pylori* positivity in 50.5% of 218 patients who underwent

endoscopic biopsy due to dyspepsia complaint in 2010. In studies conducted in Konya region, while Kesli et al. (29) found *H. pylori* positive in 36.6% of 168 patients who applied with dyspepsia complaints and underwent endoscopic gastric biopsy in 2010, Korkmaz et al. (30) found *H. pylori* positive in 45.4% of 198 dyspepsia patients who underwent endoscopy in 2012. In studies conducted between 2003 and 2008, the prevalence of *H. pylori* antigen was reported as 70.1% (30) in Sivas, 64% - 44.2% (32, 33) in Konya, and 58.4% (34) in Kayseri. The most comprehensive study on epidemiological studies on *H. pylori* in adults in our country is the TURHEP study conducted in 2003. In this study, the general prevalence of *H. pylori* was found to be 82.5% using the urea breath test in 5.549 adults over the age of 18, and the prevalence was found to be 84% in men and 81% in women (35). Again, in the study of Çiftel et al. (36) involving 653 patients in Erzurum region, *H. pylori* positivity was found to be 57.7% and it was reported as mild (+) positive in 58.7% of the patients with *H. pylori*. When the literature is examined in terms of positivity and clinical and laboratory results, not many studies have been found. Only Dağlı et al. (37) found a relationship between the degree of *H. pylori* positivity and mast cell density, which is known to be the primary trigger of inflammation. In our study, *H. pylori* was examined histopathologically in patients whose biopsy was taken. In addition to the presence of *H. pylori*, its density was also examined. In our study, *H. pylori* was found to be positive in 81.3% of the patients who underwent endoscopy by histopathological examination. The degree of *H. pylori* positivity was mildly (+) positive with a rate of 74.5% in line with the literature, and the frequency of *H. pylori* positivity between women and men was similar as in the literature (36).

The difference in the frequency of *H. pylori* positivity in studies may be due to the presence of various risk factors in the studied population, such as environmental reasons, hygiene, low education level, regional backwardness, previous gastrointestinal endoscopy, and less eradication. Megraud et al. (38) showed that with the increase in the incidence of atrophic gastritis in advanced ages, *H. pylori* lost its ecological home and its frequency decreased. Low education level, regional backwardness, hygiene and less eradication may be the main factors due to the high *H. pylori* positivity rates in our region.

Approximately one million people worldwide die from diseases associated with *H. pylori* every year (39). Considering that *H. pylori* is the main etiological factor especially in gastric cancer and its associated other diseases and its frequency in the general population, it is estimated that *H. pylori* infection will remain on the

agenda as the leading health problem in developing countries for the next 50 years (11, 39). For this reason, it becomes necessary to monitor the changes in the frequency of *H. pylori* and to make its eradication. Expecting a reduction in the incidence of gastric cancer with the eradication of *H. pylori* seems to be the most effective and cost-effective method.

Gastric polyps are detected incidentally during the endoscopy procedure. In a study involving 13 thousand patients, the prevalence of gastric polyps was found to be 1.2% (40). In a study conducted in the Kırıkkale region of our country, the frequency of gastric polyps was found to be 1.5% (41). In our study, it was found to be 1.8%.

In studies conducted in our country, while the frequency of gastric ulcer was 10% and duodenal ulcer frequency was found to be 11% in Şanlıurfa region, the frequency of gastric ulcer was 9% and duodenal ulcer frequency was found to be 15% in Aydın region (42,43). In our study, the frequency of gastric ulcer was 6% and the frequency of duodenal ulcer was 2.2% in the Yozgat region.

CONCLUSION

The frequency of *H. pylori* was found to be 81.3% in Yozgat region and it was often mildly positive (+). In addition, the prevalence of *H. pylori* was similar between men and women, consistent with the literature. The most common diagnosis was reported as "chronic active gastritis". Gastric ulcer frequency was 6%, duodenal ulcer frequency was 2.2%, gastric poly frequency was 1.8%, gastric cancer was 1.3%, and esophageal cancer was 0.1%. As a result, with this study, we have presented the upper gastrointestinal endoscopy data of our region to the literature and it is the first study conducted in the Yozgat region.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Yozgat Bozok University Clinical Researchs Ethics Committee (Date: 14.04.2021, Decision No: 2017-KAEK-189_2021.04.14_04).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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