ORIGINAL ARTICLE

DOI: 10.4274/nkmj.galenos.2023.42103
Nam Kem Med J 2023;11(4):340-345

Retrospective Evaluation of Stool *Helicobacter pylori* Antigen Test, Endoscopy and Histopathological Findings in Elderly Patients with Dyspepsia

Dispepsiyle Başvuran Yaşlı Hastalarda Dışkıda *Helicobacter pylori* Antijen Testi, Endoskopi ve Histopatolojik Bulguların Retrospektif Olarak Değerlendirilmesi

Mürsel KARADAVUT[1], Mustafa UTLU[1], Büşra AKPINAR[1], E. Füsun KARAŞAHİN[2], Hakan DURSUN[3], Pınar TOSUN TAŞAR[1]

[1]*Atatürk University Faculty of Medicine, Department of Internal Medicine, Clinic of Geriatrics, Erzurum, Turkey*
[2]*Erzurum Provincial Health Directorate, Directorate of Public Health Services, Erzurum, Turkey*
[3]*Atatürk University Faculty of Medicine, Department of Internal Medicine, Clinic of Gastroenterology, Erzurum, Turkey*

ABSTRACT

Aim: The number of studies examining the frequency of *Helicobacter pylori* (Hp) infection, Hp antigen (Ag) test in the stool together with endoscopy and pathology findings in the elderly is limited in the literature. The aim of this study was to investigate the frequency of Hp Ag positivity in the stool samples of elderly patients who checked in to the internal medicine clinics of our hospital with dyspepsia and its relationship with age, gender, seasonal changes, endoscopy and pathology findings.

Materials and Methods: The data of the geriatric patients whose stool samples were investigated for the presence of Hp Ag who applied to the Internal Medicine Clinics of our university with dyspepsia between January 1, 2018 and January 1, 2023 were retrospectively analyzed. Besides demographic and clinical data, endoscopy and pathology reports were recorded.

Results: A total of 2276 patients were included in the study. 60.3% of the patients who requested Hp Ag test were female. Of the total 592 stool samples tested, 20.3% were positive. Hp positivity was highest in the young-old group with a rate of 81.7% ($p<0.01$). In the distribution of Hp positivity, according to the seasons, it was observed that the highest positivity rate was in winter with 44.2% ($p<0.001$). It was found that endoscopy was performed in 11.4% of the patients, and the most common findings were gastritis in 76.9%, and duodenitis in 38.5% in patients whose Hp Ag test positive and undervent endoscopy.

Conclusion: Hp infection appears to be more common in the young-old group and in the winter months. Although in the guidelines endoscopy is recommended for elderly patients presenting with dyspepsia, it has been observed that endoscopy was performed at a low rate in elderly patients. Endoscopy should not be avoided in elderly patients presenting with dyspepsia.

Keywords: *Helicobacter pylori*, stool antigen test, elderly, endoscopy, pathology

ÖZ

Amaç: Literatürde yaşlılarda *Helicobacter pylori* (Hp) enfeksiyonu sıklığını, dışkıda Hp antijen (Ag) testi ile endoskopi ve patoloji bulgularını birlikte inceleyen çalışma sayısı kısıtlıdır. Bu çalışmada; dispeptik yakınmalar ile hastanemiz iç hastalıkları kliniklerine başvuran yaşlı hastaların dışkı örneklerinde Hp Ag pozitifliğinin sıklığı ve yaş, cinsiyet, mevsimsel değişiklikler, endoskopi ve patoloji bulguları ile olan ilişkisinin araştırılması amaçlanmıştır.

Gereç ve Yöntem: Üniversitemiz iç hastalıkları kliniklerine 1 Ocak 2018-1 Ocak 2023 tarihleri arasında dispepsi ile başvuran geriatrik hastalarda dışkı örneklerinde Hp Ag varlığı araştırılan hastaların verileri retrospektif olarak incelendi. Demografik ve klinik verilerin yanı sıra, endoskopi ve patoloji raporları kaydedildi.

Address for Correspondence: Pınar TOSUN TAŞAR MD, Atatürk University Faculty of Medicine, Department of Internal Medicine, Clinic of Geriatrics, Erzurum, Turkey
Phone: +90 505 398 89 85 **E-mail:** pinar.tosun@gmail.com **ORCID ID:** orcid.org/0000-0002-2617-4610
Received: 21.06.2023 **Accepted**: 12.09.2023

Bulgular: Çalışmamıza toplam 2.276 hasta dahil edildi. Hp Ag testi istenen hastaların %60,3'ü kadın idi. Test edilen toplam 592 dışkı örneğinden %20,3'ü pozitif saptandı. Hp pozitifliği en yüksek %81,7 oranında genç yaşlı gruptaydı (p<0,01). Hp pozitifliğinin mevsimlere göre dağılımında en yüksek pozitiflik oranının %44,2 ile kış mevsiminde olduğu görüldü (p<0,001). Hastaların %11,4'üne endoskopi yapıldığı, Hp Ag testi pozitif olup endoskopi yapılan hastalarda en sık %76,9 gastrit ve %38,5 duodenit olduğu saptandı.

Sonuç: Hp enfeksiyonu genç yaşlı grupta ve kış aylarında daha sık gözükmektedir. Kılavuzlarda dispepsi yakınması ile başvuran yaşlı hastalara endoskopi önerilmesine rağmen yaşlı hastalara düşük oranda endoskopi yapıldığı görülmüştür. Dispepsi ile başvuran yaşlı hastalarda endoskopi yapılmasından çekinilmemelidir.

Anahtar Kelimeler: *Helicobacter pylori*, dışkı antijen testi, yaşlı, endoskopi, patoloji

INTRODUCTION

Dyspepsia, defined as pain and discomfort in the upper abdominal region, is a common symptom with a comprehensive differential diagnosis and heterogeneous pathophysiology[1]. Although its prevalence is 20% worldwide, it is more common in the geriatric population due to the increased frequency of chronic diseases and drug use[2]. The 75-80% of dyspepsia for which no organic cause can be identified is called functional or non-ulcer dyspepsia. Dyspepsia can be observed due to many organic causes, especially peptic ulcer, gastroesophageal reflux, pathologies related to *Helicobacter pylori* (Hp) infection, drugs and gastric malignancies[3].

Hp is a spiral-shaped, microaerophilic, Gram-negative, flagellated and motile bacterium[4]. The prevalence of Hp infection increases with age worldwide, being 10% between the ages of 18 and 30, rising to 40-60% in asymptomatic elderly individuals and over 70% in elderly patients with gastroduodenal disease[5,6]. However, the percentage of Hp-positive elderly patients treated for their infections is very low[7]. The elderly population is rapidly increasing in Turkey and around the world[8]. With the increasing elderly population, the number of elderly patients admitted to hospitals with gastrointestinal system (GIS) problems is also increasing. The abundance of comorbid chronic diseases, polypharmacy and drug interactions, and the increased frequency of GIS diseases in the elderly make the differential diagnosis and treatment of dyspepsia difficult[9]. Guidelines recommend testing and treatment for Hp for those presenting with dyspepsia and that anyone over the age of 60 with symptoms of dyspepsia should undergo endoscopy. Among the non-invasive tests, active infection tests (urea breath test or stool antigen test) are recommended for patients, but serological tests are not recommended due to their low positive predictive values[10].

In our literature review, to the best of our knowledge, the number of studies examining the prevalence of Hp in the elderly and examining fecal Hp antigen (Ag) test and endoscopy and pathology findings together is limited. Our aim in this study is to investigate the frequency of Hp infection in elderly patients and to examine its relationship with endoscopy and pathology findings.

MATERIALS AND METHODS

Our study is a descriptive cross-sectional study conducted among patients who applied to our hospital's internal medicine clinics with dyspeptic complaints between 01 January 2018 and 01 January 2023.

Inclusion criteria were determined as:

- Presence of Hp Ag in their fresh stool samples is investigated,
- Patients aged 65 and over with complaints of dyspepsia.

Exclusion criteria were determined as:

- Patients known to have had any previous Hp test positivity,
- Patients younger than 65 years of age.

Demographic data of the patients; endoscopy and pathology reports, along with the localization of findings, were scanned from patient files and the hospital information system. Demographic data and Hp frequencies of the patients were divided into general, gender and age groups. Patients were grouped as youngest-old (65-74), middle-old (75-84) and oldest-old (≥85)[11]. In the endoscopy reports, the esophagus, Z line, cardia, fundus, corpus, antrum, pylorus, bulbus and the second part of the duodenum were examined.

The study was carried out by obtaining the necessary permissions from the Atatürk University Faculty of Medicine Clinical Research Ethics Committee (decision no: 435, dated: 01.06.2023).

Statistical Analysis

The data were recorded in the Statistical Package for the Social Sciences-23.0 package program and analyzes were conducted using the same program again. Demographic data were presented as number (n), percentage (%) and median (minimum-maximum). Pearson chi-square test was used to compare categorical variables, and Mann-Whitney U test was used to compare the numerical values of two independent groups whose data were distributed nonparametrically. Results were accepted as statistical significance p<0.05 within the 95% confidence interval.

RESULTS

In our study, 2,276 patients whose fresh stool samples were investigated for the presence of Hp Ag after presenting with complaints of dyspepsia were examined. 1,640 (72.1%) of the patients did not provide a sample, 44 (1.9%) of the patients could not be tested due to lack of a kit, 472 (20.7%) patients were Hp Ag negative, and 120 (5.3%) patients were Hp Ag positive. Of the patients for whom Hp Ag testing was requested, 1,372 (60.3%) were women and 904 (39.7%) were men. Their mean age was 71.76±6.03 and the median was 70.0 (minimum-oldest: 65-99) (Table 1). Of the 592 patients who underwent Hp Ag testing, 356 (60.1%) were female and 236 (39.9%) were male. Hp Ag positivity was found to be 20.3% on average. This rate was found to be 20.8% in men and 19.9% in women. Of the Hp Ag positive patients, 71 (59.2%) were female and 49 (40.8%) were male. No statistically significant difference was found between genders (p=0.83) (Table 2). When Hp Ag test positive and negative patients were compared in terms of age without grouping, no statistically significant difference was detected (p=0.11). Of the 592 patients for whom the Hp Ag test was studied, 445 (75.2%) were in the youngest-old group (Table 3) and the highest Hp Ag positivity was detected in the young-old group (81.7%) (Table 4). There was statistical significance in terms of Hp Ag positivity between age groups (p<0.01). When Hp Ag positivity was compared according to seasons, it was determined that it was most common in winter months with 44.2%. The relationship between Hp frequency and seasons was statistically significant (p<0.001) (Table 5).

It was determined that endoscopy was performed in 259 (11.4%) of 2,276 patients for whom Hp Ag test was requested, and 86 (33.2%) patients who underwent endoscopy had a pathology report; 13 (10.8%) of 120 patients with Hp Ag (+) underwent endoscopy, 2 (15.4%) patients who underwent endoscopy had a pathology report, 31 (6.6%) of 472 Hp Ag (-) patients underwent endoscopy, and 8 (25.8%) patients who underwent endoscopy had a pathology report. In 13 patients with Hp Ag (+) who underwent endoscopy, the most common was gastritis (76.9%), and the second most common was duodenitis (38.5%). In terms of localization, 70% of gastritis is pangastritis, 30% is antral gastritis; 60% of duodenitis was detected as only the bulbus, and 40% was detected as both the bulbus and the second part of the duodenum. Endoscopy findings of patients with Hp Ag (+) are shown in Table 6. The number of patients was insufficient to statistically evaluate the difference between endoscopy and pathology findings of patients with Hp Ag (+) and (-).

Table 1. Gender distribution of patients for whom Hp Ag testing was requested

Gender	Number	Percentage (%)
Female	1,372	60.3
Male	904	39.7
Total	2,276	100

Hp: *Helicobacter pylori*, Ag: Antigen

Table 2. Comparison of Hp Ag positivity according to gender

Gender	Antigen (-) n (%)	Antigen (+) n (%)	Total n (%)	p
Female	285 (80,1)	71 (19.9)	356 (60.1)	0.83
Male	187 (79,2)	49 (20.8)	236 (39.9)	
Total	472 (79,7)	120 (20.3)	592 (100)	

Hp: *Helicobacter pylori*, Ag: Antigen

Table 3. Comparison of Hp Ag test results by age

Age Group	Antigen (-) n (%)	Antigen (+) n (%)	Total n (%)	p
65-74	347 (78.0)	98 (22.0)	445 (78.0)	0.15
75-84	109 (85.8)	18 (14.2)	127 (21.4)	
≥85	16 (80.0)	4 (20.0)	20 (3.4)	
Total	472 (79.7)	120 (20.3)	592 (100)	

Hp: *Helicobacter pylori*, Ag: Antigen

DISCUSSION

Hp infection is the most common chronic bacterial infection worldwide[12] and has a role in the etiology of chronic gastritis, non-ulcer dyspepsia, most duodenal and gastric ulcers, gastric adenocarcinoma, and mucosa-associated lymphoid tissue-lymphoma[13-16]. The main reservoir of HP is humans and it colonizes the corpus, cardia and distal antrum of the stomach.

Table 4. Comparison of Hp Ag positivity according to age groups

Age Group	Hp antigen positive		p
	n	%	
65-74	98	81.7	<0.01
75-84	18	15.0	
≥85	4	3.3	
Toplam	120	100	

Hp: *Helicobacter pylori*, Ag: Antigen

Table 5. Comparison of Hp Ag positivity according to seasons

Season (months)	Hp antigen positive		p
	n	%	
Winter (December-January-February)	53	44.2	<0.001
Spring (March-April-May)	18	15.0	
Summer (June-July-August)	17	14.2	
Autumn (September-October-November)	32	26.7	
Total	120	100	

Hp: *Helicobacter pylori*, Ag: Antigen

Although the exact mode of transmission of the infection is not known, fecal-oral or oral-oral routes through water or food consumption are thought to be a very common cause[17].

In our study, consistent with the literature, the majority (60.3%) of the patients who were asked for Hp Ag test after presenting with complaints of dyspepsia were female patients[18-21]. In the meta-analysis conducted by Ford et al.[2], it was reported that dyspepsia was more common in women, and in the study conducted by Bektaş et al.[22], it was reported to be seen in 41.1% of women and 22.1% of men. We think that the reason why the Hp Ag test is requested more in women in our study is that dyspepsia is more common in female patients. In our study, Hp positivity was detected in 120 of 592 cases (20.3%). The prevalence of Hp varies according to the social and economic status of the society in different geographical regions and ethnic groups. The prevalence is higher in low socioeconomic status groups and developing countries[23]. While it is observed between 10-50% in developed countries, it is more common than 80% in developing countries[5]. The prevalence of Hp in the geography including our country is higher than in western societies. In the study conducted by Vilaichone et al.[24], it was shown that the prevalence of Hp varies not only from country to country but also in different regions of the same country. The fact that Hp infection is more common in individuals with low socioeconomic status and living in crowded environments supports that the mode of transmission may be fecal-oral. Studies conducted in our country have reported that the prevalence of Hp varies according to regions and age groups (20.3-89.8%), increases with age, and has tended to decrease in recent years[18,19,25-29]. Demir et al.[26] reported the prevalence of Hp as 25.2% in their study, while Selek et al.[25] reported that it was 20.3%, similar to our study (20.3%), which was low compared to other studies. The frequency of HP infection decreases after eradication treatments in line with the 'test and treat' recommendations of the guidelines. A study conducted in Sweden showed that the prevalence of Hp in the 56-80 age group, which was 64% in 1989, decreased to 22% in 2012[30]. The decline in Hp prevalence in a country is associated with economic recovery and improvement in healthcare services. In Japan, the prevalence of Hp was found to be 70-80% in adults born before 1950, 45% in those born between 1950 and 1960, and 25% in those born between 1960 and 1970, and this rapid decline was attributed to economic progress and improvement in sanitation[31]. Our study supports the decreasing trend in prevalence seen in the data obtained in recent publications. In our country, this decrease in recent years is may be due to the improvement in hygiene conditions along with the progress in socioeconomic status, changes in health policies, the prevention of Hp infection by non-invasive methods and more frequent application of eradication treatments, either through testing or empirically.

Table 6. Endoscopy findings of Hp Ag positive patients

Endoscopic finding (n=13)	n	%
Normal	1	7.7
Tracheoesophageal fistula	-	-
Inlet patch	-	-
Esophageal stenosis	-	-
Esophagitis	-	-
Esophageal candidiasis	-	-
Esophageal varicose veins	1	7.7
Esophageal mass	-	-
Gastroesophageal reflux disease	-	-
Lower esophageal sphincter insufficiency	1	7.7
Esophageal ulcer	-	-
Hiatal hernia	-	-
Previous stomach surgery	-	-
Gastritis	10	76.9
Gastric erosion	2	15.4
Gastric ulcer	-	-
Gastric polyp	-	-
Gastric mass	-	-
Enterogastric bile reflux	2	15.4
Duodenal erosion	1	7.7
Duodenal ulcer	-	-
Duodenitis	5	38.5
Duodenal polyp	-	-
Duodenal diverticulum		

Hp: *Helicobacter pylori*, Ag: Antigen

Although there is no difference in Hp positivity between genders in many studies, there are also studies reporting that positivity is higher in men than in women[19,21]. As in similar studies, Hp positivity was found to be higher in male patients in our study, although it was not statistically significant. In the study carried out by Demirtaş et al.[18], in which the prevalence of Hp was investigated by including 1,405 patients, no significant difference was found between the geriatric age groups in terms of the frequency of Hp. In the study conducted by Uyanıkoğlu et al.[19] in which 1,298 endoscopic antrum biopsies were examined histopathologically, it was shown that Hp positivity was not related to age. Again, in the study conducted by Şengül and Şengül[29] in which the prevalence of Hp was investigated in 373 patients, no difference was found between Hp frequency and age groups. In our study, similar to the literature, no significant difference was found in terms of Hp positivity between age groups in the geriatric population. However, when we compare Hp (+) patients according to age groups, the highest number of Hp (+) patients was in the youngest-old group. We think that this may be due to the high ratio of youngest-old people in the elderly population (64.5%)[8].

Moshkowitz et al.[32] and Selek et al.[25] found in their study that Hp positivity was statistically significantly higher in the winter season, similar to our study. The higher frequency of Hp positivity in winter may be due to immunosuppression and increased social life.

In our study, it was shown that endoscopy was performed at a low rate in elderly patients who applied with complaints of dyspepsia (11.4%) and biopsies were taken at a low rate in patients who underwent endoscopy (33.2%). The low rate of procedures performed may be due to the fact that elderly patients are considered to have a high probability of complications due to the presence of increased comorbid diseases, especially cardiac and pulmonary diseases, increased use of medications including anticoagulants and antiaggregants, fragility that occurs in older ages, and problems such as low performance status. Guidelines recommend that all patients aged 60 and over who present with dyspepsia undergo upper GI endoscopy and take five biopsies: two from the antrum, two from the corpus, and one from the incisura angularis[33]. It has been shown in the literature that upper GI endoscopy is well tolerated in elderly patients and there is no increase in the risk of complications[34]. In our study, the most common endoscopy findings of Hp (+) patients were found to be gastritis and duodenitis, consistent with the literature[20,35]. This finding is an expected finding considering the pathophysiology of Hp, especially since it colonizes the gastric type epithelium and settles in the stomach, causing inflammation and acid hypersecretion.

Study Limitations

Our study has some limitations that should be mentioned. The main limitations of our study are that the data were collected from patient records, that the data were collected from patient records, that the cases were sourced from a single center, that they were not community-based and that they were only cases that could reach tertiary care.

CONCLUSION

As a result, although dyspeptic complaints are more common in women in the geriatric population, there is no difference between genders in terms of Hp infection. The prevalence of Hp in our country is decreasing compared to previous years. Hp infection seems to be more common in youngest-old groups and in winter months. Although endoscopy is recommended in the guidelines for elderly patients presenting with dyspepsia, it has been observed that endoscopy is performed at a low rate in elderly patients. In elderly patients, if clinically necessary, upper GIS endoscopy, which is a reliable procedure with a low risk of complications, should not be avoided.

Ethics

Ethics Committee Approval: The study was carried out by obtaining the necessary permissions from the Atatürk University Faculty of Medicine Clinical Research Ethics Committee (decision no: 435, dated: 01.06.2023).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: M.K., E.F.K., H.D., Concept: M.K., E.F.K., H.D., Design: M.K., E.F.K., H.D., Data Collection or Processing: M.K., M.U., B.A., H.D., Analysis or Interpretation: M.K., E.F.K., P.T.T., Literature Search: M.K., M.U., B.A., E.F.K., P.T.T., Writing: M.K., P.T.T.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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