

Helicobacter pylori Prevalence in Patients Who Underwent Endoscopy in Our Region

Bölgemizde Endoskopi Yapılan Hastalarda *Helicobacter pylori* Sıklığı

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ABSTRACT

Objective: The aim of this study was to investigate *Helicobacter pylori* positivity frequency in endoscopic biopsies of patients who admitted to Siirt Training and Research Hospital, and its relation with seasonal changes, age and gender factors

Methods: Endoscopy and pathology evaluation reports from patients who had endoscopy for various reasons between January 2017 and January 2021 were reviewed in this study. The frequency of *H. pylori* infection were assessed based on gender, age group and season. The patients were classified as (-) none, (+) mild, (++) moderate, (+++) severe positivity using the Sydney classification.

Results: A total of 2065 patients (45.8% males, 54.2% females) who had biopsies were included. Mean age was found as 39.0 ± 16.936 years (range 13-90 years). *H. pylori* positivity was detected as 52.15% (1077), while negativity was 47.8% (988). There was no statistically significant difference between the two sexes in terms of *H. pylori* frequencies. The highest rate of *H. pylori* positivity was found in the 15-30 age group (66.27%) and the lowest rate in the 61-90 age group (31.48%). Statistical significance was observed in terms of *H. pylori* frequencies among age groups ($p < 0.05$). There was no statistically significant difference in terms of total *H. pylori* frequencies between the seasons ($p > 0.05$).

Conclusion: As a result, the frequency of *H. pylori* was found to be 52.15%. Due to the high rate of *H. pylori* positivity in our region, we think that there is still a serious public health problem that needs to be addressed in terms of related diseases.

Key words: *Helicobacter pylori*, frequency, age, gender

ÖZET

Amaç: Bu çalışmanın amacı, Siirt Eğitim Araştırma Hastanesi'ne başvuran hastalarda, endoskopik biyopsilerde *Helicobacter pylori* rastlanma sıklığı ile mevsim, yaş ve cinsiyet gibi faktörler arasındaki ilişkiyi incelemektir.

Yöntemler: Bu çalışmada Ocak 2017-Ocak 2021 tarihleri arasında çeşitli nedenlerle endoskopi yapılan hastaların endoskopi ve patoloji değerlendirme raporları gözden geçirilip, *H. pylori* enfeksiyon sıklığı cinsiyet, yaş ve mevsimlere göre değerlendirildi. Hastalar Sydney sınıflandırması kullanılarak (-) yok, (+) hafif, (++) orta yoğunlukta, (+++) şiddetli pozitif olarak sınıflandırıldı.

Bulgular: Biyopsi yapılan toplam 2065 hasta (% 45,8 erkek, % 54,2 kadın) çalışmaya dahil edildi. Ortalama yaş 39,0 ± 16,936 yıl (aralık 13-90 yıl) olarak bulundu. *H. pylori* pozitifliği % 52,15 (1077), negatiflik ise % 47,8 (988) olarak tespit edildi. *H. pylori* sıklıkları açısından iki cinsiyet arasında istatistiksel olarak anlamlı bir fark yoktu. *H. pylori* pozitifliği en yüksek oran 15-30 yaş grubunda (% 66,27), en düşük oran ise 61-90 yaş grubunda (% 31,48) bulunmuştur. Yaş grupları arasında *H. pylori* sıklıkları açısından istatistiksel anlamlılık gözlemlendi ($p < 0.05$). Mevsimler arasında toplam *H. pylori* sıklıkları açısından istatistiksel olarak anlamlı fark yoktu ($p > 0.05$). Toplam *H. pylori* sıklıkları açısından da mevsimler arasında istatistiksel olarak anlamlı bir değişiklik gözlemlenmedi ($p > 0.05$).

Sonuç: Sonuç olarak *H. pylori* sıklığı % 52,15 olarak bulundu. Bölgemizdeki yüksek oranda *H. pylori* pozitifliği nedeniyle ilişkili olduğu hastalıklar açısından halen ele alınması gereken ciddi bir halk sağlığı sorunu olduğunu düşünmekteyiz.

Anahtar kelimeler: *Helicobacter pylori*, sıklık, yaş, cinsiyet

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1. INTRODUCTION

Marshall and Warren first identified *Helicobacter pylori* from the gastric epithelium of patients with chronic atrophic gastritis in 1983. In the following years, it was observed that it played a role in other gastrointestinal system diseases (Marshall & Warren, 1984). It is a motile, spiral-shaped, microaerophilic, Gram-negative, rod and flagellate bacteria located on the gastric mucosa (Suerbaum, 2002). *H. pylori* infection is generally acquired in early childhood and continues throughout life. Besides, it is seen in more than half of the world population (Johnson et al., 2012; Soylu et al., 2019). Despite the acidic environment and thick mucin layer in the stomach, *H. pylori* colonizes in the antrum and corpus in the stomach and also in the duodenum thanks to the urease enzyme and various adhesins (Johnson et al., 2012; Karagöz & Karaman, 2020). It is usually found under the gastric mucus layer, close to the epithelial cells and damages the epithelial cells (Malfertheiner et al., 2007). As a result of this, it causes chronic gastritis, peptic ulcer disease, gastric carcinoma and gastric mucosa-associated lymphoid tumor (MALT Lymphoma) diseases (Johnson et al., 2012; Oluwasola et al., 2002; Suerbaum, 2002).

The ways of transmission of *H. pylori* are not known exactly. However, living in crowded environments, poor hygiene conditions, low socioeconomic level, malnutrition, iron deficiency anemia, coronary artery disease, low education level of the mother and being in the O blood group are considered as risk factors (Yücel et al., 2008). Owing to development of socioeconomic, smaller family sizes, better sanitation, and the widespread use of antibiotics, it has become less common in recent years (Karagöz & Karaman, 2020).

Invasive techniques such as demonstrating the bacteria with culture and histopathological examinations made from samples taken by endoscopic biopsy, polymerase chain reaction (PCR), and urease tests are used in the diagnosis, as well as noninvasive methods such as urea breath test and serological tests (De Korwin, 2003; Uyanıkoğlu et al., 2012). Hematoxylin eosin and modified giemsa dyes are favored in pathological diagnosis because they are sensitive, simple to use, and reachable (Winn Jr, 2006).

In this study, it was aimed to investigate the frequency of *H.pylori* positivity in endoscopic biopsy results obtained

from patients who applied to Siirt Training and Research Hospital for various reasons, and the relationship of the frequency with seasonal, age and gender.

2. MATERIALS AND METHODS

In this study, endoscopy and pathology evaluation of patients who underwent endoscopy for different reasons at Siirt Training and Research Hospital between January 2017 and January 2021 reports were evaluated retrospectively. Upper gastrointestinal system endoscopy reports of 2065 patients whose reasons for performing endoscopy were recorded were evaluated. Patients with malignancy, active bleeding, and known *H. pylori* eradication therapy were excluded from the study. Both antrum and corpus biopsy results were included in the study in pathology reports. 1120 of the cases in the study were women and 945 were men.

Antrum and corpus biopsies were examined under light microscopy, evaluated with hematoxylin-eosin and modified giemsa stains The preparations were reported as (-) none, (+) mild, (++) moderate, (+++) severe positivity based on Sydney classification. *H. pylori* prevalence was investigated in patients according to gender, age and season. The patients were divided into four age groups: 15-30, 31-45, 46-60, and over 61 years old. SPSS statistical package program (IBM SPSS Version 22.0) was used to evaluate the data.

This study was approved by the Siirt University Non-Interventional Clinical Research Ethics Committee (Meeting date: 30/04/2021, meeting number: 6069, decision no: 2021/01.01)

3. RESULTS

In this study, it was determined that 945 (45.8%) of the patients were male and 1120 (54.2%) of them were female. The mean age was 39.0 ± 16.936 years (range 13-90 years). *H. pylori* positivity was 52.15% (1077), while negativity was 47.8% (988). Approximately 18.2% of the *H. pylori* positive patients were found to have mild, 21.6% moderate and 12.3% severe positivity (Table 1).

Table 1. The prevalence of *H. pylori*

<i>H. pylori</i>	Negative (-)	Positive (+)	Positive (++)	Positive (+++)	Total positive
n	988	376	446	255	1077
%	47.8	18.2	21.6	12.3	52.15

While 52.17% of a total of 945 male patients were found to be *H. pylori* positive, 52.14% of 1120 female patients were found to be *H. pylori* positive (Table 2). There was no

statistically significant difference between the two sexes in terms of *H. pylori* frequencies.



Table 2: Distribution of *H. pylori* by gender

Gender	Negative (-)	Positive (+)	Positive (++)	Positive (+++)	Total positive
Male n (%)	452 (47.8%)	187 (19.8%)	185 (19.6%)	121(12,8%)	493/945 (52.17%)
Female n (%)	536 (47.9%)	189 (16.9%)	261 (23.3%)	134 (12.0%)	584/1120 (52.14%)
Age means (SD)	45.73 (17.257)	39.36 (16.22)	35.1 (14.62)	36.42 (15.42)	41.13 (16.94)

Two thousand sixty-five patients included in the study were divided into 4 age groups and examined in terms of *H. pylori* positivity according to age groups. The frequency of *H. pylori* was determined as 66.27%, 53.12%, 44.47% and

31.48% in 15-30 age, 31-45 age, 46-60 age, and 61-90 age groups, respectively (Table 3). Statistical significance was observed in terms of *H. pylori* frequencies among age groups ($p < 0.05$).

Table 3. *H. pylori* distribution by age groups

Age Group	Negative (-)	Positive (+)	Positive (++)	Positive (+++)	Total positive
Group 1 (15-30) n (%)	227 (33.7%)	126 (18,7%)	208 (30.9%)	112 (16,6%)	446/673 (66.27%)
Group 2 (31-45) n (%)	293 (46.9%)	121 (19.4%)	138 (22.1%)	73 (11,7%)	332/625 (53.12%)
Group 3 (46-60) n (%)	246 (55.5%)	84 (19.0%)	66 (14.9%)	47 (10.6%)	197/443 (44.47%)
Group 4 (>=61) n (%)	222 (68.5%)	45 (13.9%)	34 (10.5%)	23 (7.1%)	102/324 (31.48%)

p-value=0.0305

In our study, *H. pylori* positivity was also evaluated depending on the seasons (Fig. 1). The frequency of *H. pylori* was determined as 52.73%, 51.9%, 52.5% and 51.2% in

winter, spring, summer and autumn, respectively. There was no statistically significant difference in terms of total *H. pylori* frequencies between the seasons ($p > 0.05$).

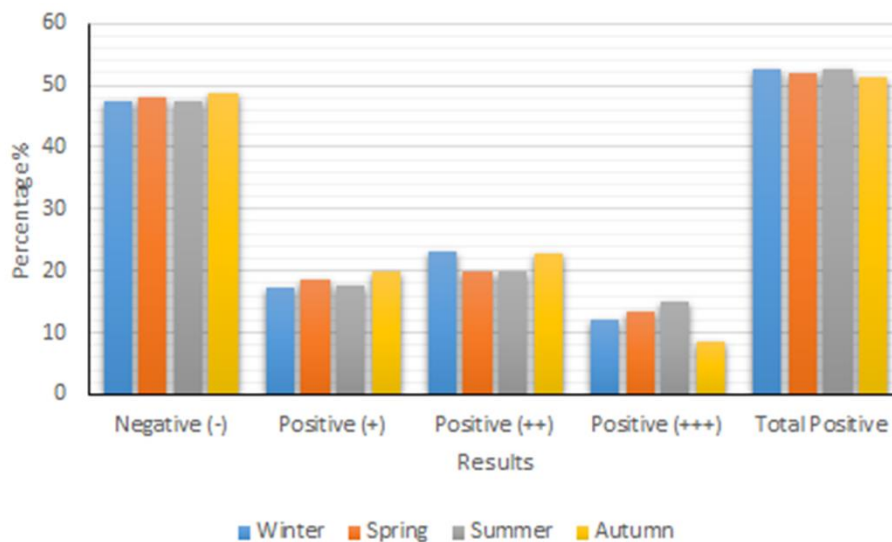


Figure 1. *H. pylori* distribution by seasons

3. DISCUSSION

It has been reported that more than 50% of the world population is infected with *H. pylori*, and 10-20% of these infected people become symptomatic. For this reason, it is

an important health problem in terms of being the most common permanent bacterial infection worldwide and the diseases it causes (Makola et al., 2007). *H. pylori*, whose source is only human and cannot be isolated from any source other than human, survives in the corpus, cardia and antrum



distal in the stomach. Although transmission between humans has not been fully established, evidence has been reported for both fecal-oral and oral-oral transmission (Demirtas et al., 2014).

The frequency of *H. pylori* reaches up to 10-50% in developed countries and up to 100% in developing countries depending on the socio-economic level. In studies conducted in our country, Özardalı et al. (1998) reported *H. pylori* positivity in 89.8% of the cases with different endoscopic diagnoses in their 1998 study covering the Şanlıurfa region. Konakçı et al. (2010) reported *H. pylori* positivity in 50.5% of 218 patients who presented with dyspepsia and underwent endoscopic gastric biopsy in 2010. In more recent studies, Erçetin et al. (2021) reported the frequency of *H. pylori* as 48% in 359 cases. Karagöz and Karaman (2020) reported *H. pylori* positivity as 34% in 359 cases in the Kayseri region. Studies show that the frequency of *H. pylori* varies by years and regions, and is relatively lower in western societies and in the west of our country (Ozden et al., 2004). In our study, the total *H. pylori* positivity was found as 52.15%.

In the study of the EUROGAST group examining the frequency of *H. pylori*, *H. pylori* positivity was reported as 34.9% in the young age group and 62.4% in the older age group in persons aged between 25-34 and 55-64, respectively. In addition, the frequency of *H. pylori* in asymptomatic individuals aged 25-34 years was found to be 15% in Mineapolis-StPaul Minnesota, 62% in Japan and 70% in Poland. The importance of family horizontal transmission is once again revealed here.

In some studies, it has been reported that *H. pylori* positivity increases with age (Group, 1993; Veldhuyzen van Zanten et al., 1994). In the study conducted by Megraud (1993), it was found that the frequency of atrophic gastritis increases with the advancement of age and the frequency of *H. pylori* decreases due to the loss of its ecological habitat. The Eurogast study group found that the frequency of infection was higher in the elderly group (61.4%) compared to the younger group (34.9%) (Group, 1993). In our study, the highest rate of *H. pylori* positivity was found in the 15-30 age group and the lowest rate in the 61-90 age group in the age groups. A statistically significant difference was observed in terms of *H. pylori* frequencies among the age groups ($p < 0.05$). In a recent study, Erçetin et al. (2021), contrary to the literature, also found that *H. pylori* positivity was statistically higher in the young patient group. In another study conducted in 2014, Korkmaz et al. (2014) reported that *H. pylori* positivity decreased with age and was statistically significantly lower in the advanced age group. The higher incidence of *H. pylori* in the 15-30 age group may be due to less eradication treatment in this age group and the increased incidence of atrophic gastritis in the patient group over 45 years of age.

In the studies performed by Selek et al. (2013) in Istanbul, Uyanıkoğlu et al. (2012) in Erzurum, Karagöz and Karaman (2020) in Kırşehir and Erçetin et al. (2021) in İstanbul, they did not find any statistical difference between male/ female gender in terms of *H. pylori* prevalence, as in

our study. In addition, there were no statistically significant difference in terms of total *H. pylori* frequencies between the seasons in our study ($p > 0.05$).

Approximately one million people die each year from diseases associated with *H. pylori* in the world (Çiftel et al., 2016). Considering the fact that *H. pylori* is the main etiological factor in gastric cancer, other diseases it is associated with and its prevalence in the general population, *H. pylori* infection will remain on the agenda as the leading health problem of developing countries for the next 50 years (Ferlay et al., 2015; Malfertheiner et al., 2012). For this reason, monitoring and eradication of the changes in the frequency of *H. pylori* becomes mandatory. Expecting a decrease in gastric cancer incidence with the eradication of *H. pylori* seems to be the most effective and cost-effective method. Within the framework of this method, health policies and health programs should be updated (Çiftel et al., 2016).

4. CONCLUSION

As a result, the frequency of *H. pylori* was found to be 52.15% when biopsy samples taken from patients who underwent endoscopy in Siirt and its region were evaluated. While there was no significant difference among sex and seasons in terms of *H. pylori* frequency, a significant difference was observed between age groups. The highest rate of *H. pylori* positivity was found in the 15-30 age group and the lowest rate in the 61-90 age group. Due to the high rate of *H. pylori* positivity in our region, we think that it is a serious public health problem that still needs to be addressed in terms of the diseases it is associated with.

REFERENCES

1. Çiftel, S., Okçu, N., Dursun, H., Albayrak, F., & Usta, S. (2016). Bölgemizde *Helicobacter pylori* sıklığı. *Akad Gastroenterol Derg*, 15(1): 1-4.
2. De Korwin, J.-D. (2003). Advantages and limitations of diagnostic methods for *H. pylori* infection. *Gastroentérol Clin Biol*, 27(3 Pt 2): 380-390.
3. Demirtas, L., Sayar, I., Akbas, E. M., Özçiçek, A., Özçiçek, F., Timuroglu, A., . . . Türkmen, K. (2014). Endoskopi yapılan hastalarda *Helicobacter pylori* sıklığı ve yerlesim yerinin yas ve cinsiyete göre dagilimi/Distribution of the incidence and location of the *Helicobacter pylori* according to age and gender in patients who undergone endoscopy. *Dicle Tip Derg*, 41(3): 507.
4. Erçetin, C., Dural, A. C., Yiğitbaş, H., Yavuz, E., Çelebi, F., Borucu, İ., . . . Alış, H. (2021). *Helicobakter pylori* İnfeksiyonunun Endoskopik, Patolojik ve Laboratuvar Bulguları Açısından Değerlendirilmesi. *İKSSTD*, 13(1): 25-30.
5. Ferlay, J., Soerjomataram, I., Dikshit, R., Eser, S., Mathers, C., Rebelo, M., . . . Bray, F. (2015). Cancer



- incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer Res*, 136(5): E359-E386.
6. Group, E. S. (1993). Epidemiology of, and risk factors for, *Helicobacter pylori* infection among 3194 asymptomatic subjects in 17 populations. The EUROGAST Study Group. *Gut*, 34, 1672-1676.
 7. Johnson, E. M., Gaddy, J. A., & Cover, T. L. (2012). Alterations in *Helicobacter pylori* triggered by contact with gastric epithelial cells. *Front Cell Infect Microbiol*, 2: 17.
 8. Karagöz, H., & Karaman, A. (2020). *Helicobacter pylori* incidence of patients with gastritis in endoscopic biopsies. *J Feline Med Surg* 4(5): 359-362.
 9. Konakci, N., Gülten, M., İbanoğlu, M. S., Yorulmaz, H., Veyselöglu, L., Ayyildiz, T., . . . Gürel, S. (2010). Kronik aktif gastritli olgularda *Helicobacter pylori* sıklığı. *Uludağ Üniversitesi Tıp Fakültesi Derg*, 36(1): 7-10.
 10. Korkmaz, H., Kerpiç, O., & Temel, T. (2014). Konya Bölgesinde Gastroskopi Yapılan Hastalarda Histopatolojik Bulgular ve *Helicobacter Pylori* Sıklığı. *Osmangazi Tıp Derg*, 36(1): 44-49.
 11. Makola, D., Peura, D. A., & Crowe, S. E. (2007). *Helicobacter pylori* infection and related gastrointestinal diseases. *J Clin Gastroenterol*, 41(6): 548-558.
 12. Malfertheiner, P., Megraud, F., O'Morain, C. A., Atherton, J., Axon, A. T., Bazzoli, F., . . . Rokkas, T. (2012). Management of *Helicobacter pylori* infection-the Maastricht IV/Florence consensus report. *Gut*, 61(5): 646-664.
 13. Malfertheiner, P., Megraud, F., O'Morain, C., Bazzoli, F., El-Omar, E., Graham, D., . . . Kuipers, E. J. (2007). Current concepts in the management of *Helicobacter pylori* infection: the Maastricht III Consensus Report. *Gut*, 56(6): 772-781.
 14. Marshall, B., & Warren, J. R. (1984). Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration. *The Lancet*, 323(8390): 1311-1315.
 15. Mégraud, F. (1993). Epidemiology of *Helicobacter pylori* infection. *Gastroenterol Clin North Am*, 22(1): 73-88.
 16. Oluwasola, A., Ola, S., Saliu, L., & Solanke, T. (2002). *Helicobacter pylori* infection in South Nigerians: a serological study of dyspeptic patients and healthy individuals. *West Afr J Med*, 21(2): 138-141.
 17. Ozden, A., Bozdayi, G., Ozkan, M., & Köse, K. S. (2004). Changes in the seroepidemiological pattern of *Helicobacter pylori* infection over the last 10 years. *Turk J Gastroenterol*, 15(3): 156-158.
 18. Özardali, H. İ., Bitiren, M., Nazligül, Y., & Yilmaz, N. (1998). Şanlıurfa yöresinde nonerosiv antral gastritlerde helikobakter pilori sıklığı. *Genel Tıp Der*, 8(4): 149-152.
 19. Selek, M. B., Bektöre, B., Atik, T. K., Baylan, O., & Özyurt, M. (2013). Üçüncü basamak bir hastanede dispeptik yakınmaları olan hastaların dışkı örneklerinde *Helicobacter pylori* antijen pozitifliğinin değerlendirilmesi. *Dicle Med J*, 40: 574-578.
 20. Soylu, A., Peker, K. D., Yirgin, H., Sari, S. P., Akgül, Ö., Sapmaz, B., . . . Çalışkan, R. (2019). Dispepsili Hastalarda *H. pylori* ve Histopatolojik Bulguların Değerlendirilmesi. *TFK Dergisi*, 2(4): 139-141.
 21. Suerbaum, S. (2002). Michetti p. *Helicobacter pylori* infection. *Engl J Med*, 347(15): 1175-1186.
 22. Uyanıkoğlu, A., Coşkun, M., Binici, D. N., Şiir, U., Kibar, Y. İ., Ahmet, T., & Öztürk, Y. (2012). Frequency of *Helicobacter pylori* in patients underwent endoscopy. *Dicle Tıp Derg*, 39(2): 197-200.
 23. Veldhuyzen van Zanten, S. J., Pollak, P. T., Best, L. M., Bezanson, G. S., & Marrie, T. (1994). Increasing prevalence of *Helicobacter pylori* infection with age: continuous risk of infection in adults rather than cohort effect. *J Infect Dis*, 169(2): 434-437.
 24. Winn Jr, W. (2006). Konemann's color atlas and diagnostic text of microbiology. Lippencott Williams & Wilkins Publishers, Philadelphia, PA, Edition, 6: 945-1021.
 25. Yucel, T., Aygin, D., Sen, S., & Yucel, O. (2008). The prevalence of *Helicobacter pylori* and related factors among university students in Turkey. *Jpn J Infect Dis*, 61(3): 179.