



# Evaluation of the Presence of *Helicobacter Pylori* in Inflammatory Bowel Disease in Children

## Çocuklarda Enflamatuvar Bağırsak Hastalığında *Helikobakter Piloni* Değerlendirilmesi

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### ABSTRACT

**Objective:** The prevalence of *Helicobacter pylori* (Hp) infection in the pediatric patient group is high, but it depends on the geographical structure of the country. Many studies have shown that inflammatory bowel disease (IBD) is less affected by Hp infection than the general population. We aimed to evaluate Hp infection in the IBD patient group we followed and but it depends on the geographical structure of the country.

**Methods:** The files of the patients diagnosed with IBD who were followed-up in our outpatient clinic were retrospectively analyzed, and their diagnosis and presence of Hp in gastroscopic biopsy were recorded.

**Results:** A total of 50 patients, 44% female (22 patients) and 56% male (28 patients) were included in the study. The mean age of the patients was 15.3 years. In the gastroscopic biopsy results of the patients, Hp was positive in gastric biopsy at a rate of 28% (14 patients). 71.4% (10 patients) of Hp-positive patients had ulcerative colitis (UC), and 21.4% (3 patients) had Chron disease (CD). When all patients were evaluated, most patients (60%) were Hp-negative (30 patients). Among patients with UC (25 patients), Hp positivity was as high as 40% (10 patients). In CD 14% (3 patients) had Hp positivity. Hp positivity was much higher in the UC patient group. No correlation was found between the presence of Hp and polymorphonuclear leukocytes/lymph ratio, mean platelet volume, acute phase markers (C-reactive protein, sedimentation), vitamin B12, and albumin levels. However, when the ferritin means were compared, the ferritin mean of the Hp-positive patients (47.4) was lower than the Hp-negative patients (62.3).

**Conclusion:** Hp positivity was higher in the IBD patient group, particularly in patients with UC patients. Supporting the literature, Hp positivity was seen less frequently in our IBD patient group than in the general population.

**Keywords:** Pediatric, inflammatory bowel disease, *Helicobacter pylori*, gastritis

### ÖZ

**Amaç:** Çocuk hasta grubunda *Helikobakter pilori* (Hp) enfeksiyon prevalansı yüksek olup ülkelere ve coğrafik dağılıma göre farklılık göstermektedir. Yapılmış birçok çalışma enflamatuvar bağırsak hastalarının (IBH), genel topluma göre Hp enfeksiyonundan daha az etkilendiğini göstermektedir. Biz bu çalışmamız ile takip ettiğimiz IBH hasta grubunda Hp enfeksiyonunu ve Crohn hastalığı (CH) ile ülseratif kolit (UK) hastaları arasında Hp varlığının oranlarını değerlendirmeyi amaçladık.

**Gereç ve Yöntem:** Çalışma hastanemiz polikliniğinde takip edilen IBH tanılı hastaların dosyaları retrospektif olarak incelenerek tanıları, gastrokopik biyopside Hp varlığı kayıt edilmiştir.

**Bulgular:** Çalışmaya toplam 50 hasta, 22'si kız (%44) ve 28'i erkek (%56) dahil edildi. Hastaların yaş ortalaması 15,3 yaş idi. Hastalar yapılan gastrokopik biyopsi sonuçlarında gastrik biyopside Hp %28 (14 hasta) oranında pozitif idi. Hp pozitif olan hastaların %71,4'ü (10 hasta) UK, %21,4'ü (3 hasta) CH idi. Tüm hastalar değerlendirildiğinde hastaların çoğunluğunda %60'ında Hp negatif (30 hasta) idi. Hp negatif olan hastaların %50'si (15 hasta) CH idi. UK hastaları (25 hasta) içinde Hp pozitifliği %40 (10 hasta) kadar yüksek idi. CH grubunda ise %14 (3 hasta) kadar Hp pozitifliği mevcut idi. Hp pozitifliği UK hasta grubunda çok daha yüksek oranlarda idi. Hp varlığı ile polimorfonükleer lökositler/len

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## ÖZ

oranı, ortalama trombosit hacmi, akut faz belirteçleri (C-reaktif protein, sedimentasyon), B12 vitamin düzeyi, albumin düzeyleri arasında bir ilişki bulunamadı. Fakat demir ortalamaları kıyaslandığında Hp pozitif olan hastaların demir ortalaması (47,4), Hp negatif olanlardan (62,3) daha düşük idi.

**Sonuç:** Hp varlığı IBH hasta grubunda, özellikle UK hastalarında daha yüksek oranlarda saptanmıştır. IBH hasta grupları arasında özellikle UK hastalarında Hp pozitifliği daha yüksek oranlardadır. Literatürü destekler şekilde bulunmuştur ki Hp pozitifliği IBH hasta gruplarında genel topluma göre daha düşük oranlardadır.

**Anahtar Kelimeler:** Çocuk, enflamatuvar bağırsak hastalığı, *helicobakter pilori*, gastrit

## INTRODUCTION

*Helicobacter pylori* (Hp) is the bacterium that most frequently causes disease in the gastrointestinal tract (1). About 50% of the general population was infected with Hp. The prevalence of Hp infection is high in the pediatric patient group, and it differs according to country and geographical distribution (2). While the prevalence of the disease is low in high-income and developed countries (34.7%), it is higher in the middle- and low-income countries (50.8%) (3). In studies conducted in different regions in the literature, while Hp infection is <40% in developed countries, this rate has been reported to be as high as 80-90% in developing regions, especially in regions with low socioeconomic status, crowded living environments, and low-income levels (4). Recent studies have shown that the prevalence of Hp has started to decrease due to the improvement in living standards and the increase in antibiotic use (5). Inflammatory bowel diseases (IBD) are chronic diseases with idiopathic gastrointestinal system inflammation. Crohn's disease (CD) and ulcerative colitis (UC) are important health problems due to their increasing prevalence worldwide (6). Some studies have show that IBDs are less affected by Hp infection than the general population (7). In this study, we aimed to evaluate the Hp infection in the IBD patient group we followed and the distribution of infection in the CD and UC patient groups.

## METHODS

The study was conducted by retrospectively examining the files of 50 patients diagnosed with IBD between 2017 and 2021, followed by our outpatient clinic 1. The approval of the study was obtained from the University of Health Sciences Türkiye, Adana City Training and Research Hospital Clinical Research Ethics Committee, date: 4.07.2022 (decision no: 2032). We take informed consent from the patients and their parents. The diagnosis of IBD in the patients was made according to the Porto criteria (8) because of clinical, laboratory, and endoscopic biopsies. Biopsies taken from the patients included in the study were taken from the

stomach antrum 2 bx, corpus 2 bx, fixed with 10% formalin, and embedded in paraffin blocks, after hematoxylin eosin and May-Grünwald Giemsa or Masson trichrome staining, Hp colonization was evaluated by examining under a microscope. The presence of Hp was determined by histopathological examination of the biopsy material.

## Statistical Analysis

The SPSS (Statistical Package for the Social Sciences) 25.0 package program was used for statistical analysis of the data. Categorical measurements were summarized as numbers and percentages, and continuous measurements as mean and standard deviation (median and minimum-maximum where appropriate). The Shapiro-Wilk test was used to determine whether the parameters in the study showed a normal distribution. Pearson correlation test was used to determine the relationship between application and control findings in normally distributed parameters. Statistical significance level was taken as 0.05 in all tests.

## RESULTS

Fifty patients diagnosed with IBD were included in our study. Of the patients, 22 (44%) were female, and 28 (56%) were male. The mean age of the patients were 15,3 years. A total of 90% (45 patients) of the patients were in Turkish ethnicity and 10% (5 patients) were other ethnicities. Because of the histopathological examination of the gastroscopic biopsy results performed at the time of diagnosis, the presence of Hp in the gastric biopsy was positive in 28% of the patients (14 patients).

71.4% (10 patients) of Hp-positive patients had UC, and 21.4% (3 patients) had CD. Of the Hp-negative patients, 50% (15 patients) had CD and 43.3% (13 patients) had UC (Figure 1).

When all patients were evaluated, the majority of the patients (60%) were Hp-negative (30 patients), and the Hp status was unknown in 12% (6 patients). There were 25 patients with UC, among which Hp positivity was as high as 40% (10 patients). While 88% (22 patients) of these

patients had macroscopic findings compatible with gastritis during the gastroscopic examination, this rate was 67% (14 patients) in CD. There were 21 patients in the CD group, of which 14% (3 patients) had Hp positivity, whereas 71% (15 patients) of these patients were evaluated as Hp-negative. Hp positivity was much higher in the UC patient group.

No correlation was found between the presence of Hp and polymorphonuclear leukocytes/lymph ratio, mean platelet volume, acute phase markers (C-reactive protein, sedimentation), vitamin B12, and albumin levels (Table 1). However, when the mean ferritin levels between Hp-positive and negative patients were compared, the mean ferritin of Hp-positive patients was 47.4 µg/dL, while it was 62.3 µg/dL in Hp-negative patients. The mean ferritin of Hp-positive patients were lower than Hp-negative patients (Figure 2).

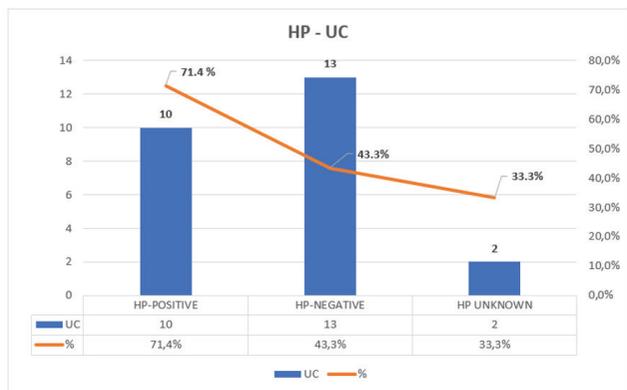


Figure 1. Evaluation of Hp positivity and negativity rates in UC patients  
Hp: *Helicobacter pylori*, UC: Ulcerative colitis

Table 1. The correlation between the presence of Hp and PNL/lymph ratio, MPV, acute phase markers (CRP, ESR), vitamin B12, and albumin levels

	Hp-positive n=14	Hp-negative n=30	Unknown n=6
	Mean (min-max)	Mean (min-max)	Mean (min-max)
PNL/lymph ratio	2.4 (1.2-4.2)	3.1 (0.5-12.5)	1.7 (0.4-3.5)
MPV	7.7 (6.1-10.6)	8.2 (5.9-11.5)	9.2 (6.8-10.8)
CRP	7.7 (0.3-48)	21.5 (0.1-143)	3.4 (0.8-5.8)
ESR	11 (2-30)	13.3 (2-71)	22.3 (9-34)
Vitamin B12 levels (mean)	269	237	432
Albumin (mean)	3.8	3.6	3,4

Hp: *Helicobacter pylori*, PNL: Polymorphonuclear leukocytes, MPV: Mean platelet volume, CRP: C-reactive protein, ESR: Erythrocyte sedimentation rate, min-max: Minimum-maximum

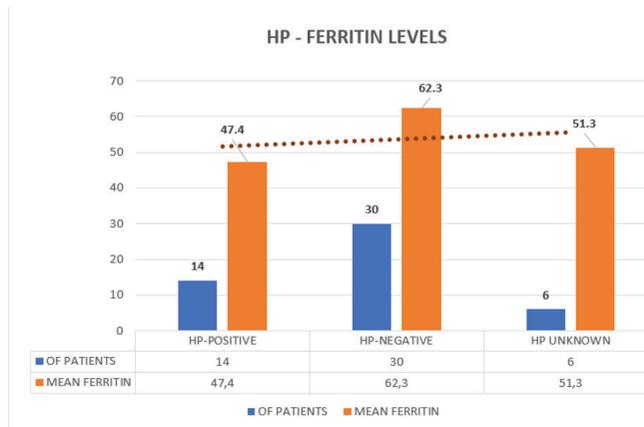


Figure 2. Evaluation of ferritin levels with the presence and absence of Hp  
Hp: *Helicobacter pylori*

## DISCUSSION

In developing countries such as ours, the prevalence of Hp has been reported to be as high as 60-70% in the childhood age group (9). In our study, in which we evaluated the presence of Hp in IBD, the rate of Hp positivity was 28%. Studies showed an inverse relationship between the presence of Hp and IBD (10). In a few case reports it show that Hp eradication may worsen UC (11).

When the literature is examined, it has been shown that the inverse relationship between Hp infection and IBD is associated with the suppression of proinflammatory responses (12). In a study by Agin et al. (13), the upper endoscopic analysis of different inflammatory disease such as Familial Mediterranean fever it revealed that 50% (14 patients) of the patients had antral gastritis [8 Hp (-) antral gastritis and 6 Hp (+) chronic active gastritis]. This suggests that the inverse relationship stems from these two diseases' socioeconomic and demographic distributions (14).

In our study, 71.4% of Hp-positive patients had UC, whereas 21.4% had CD. The fact that Hp infection was detected more frequently in patients with UC than in CD patients suggested that the frequency of Hp infection may vary in different disease types depending on the type of IBD, different from what was reported in the literature (15). The main study limitation is the small number of patients in the study. The other study restrictions are that the presence of Hp was evaluated as present or absent, and the density of Hp could not be mentioned.

## CONCLUSION

Hp infection is an important gastrointestinal infection especially in the pediatric age group with chronic conditions. The protective effect of the Hp infection for some illnesses

is getting much more priority by the time. Hp positivity was higher in the IBD patient group, especially in patients with UC patients. Supporting the literature, Hp positivity was seen less frequently in our IBD patient group than in the general population. Therefore, it should be emphasized that Hp infection should be planned in some special cases and when its treatment is deemed of serious benefit.

## ETHICS

**Ethics Committee Approval:** The approval of the study was obtained from the University of Health Sciences Türkiye, Adana City Training and Research Hospital Clinical Research Ethics Committee, date: 4.07.2022 (decision no: 2032).

**Informed Consent:** We take informed consent from the patients and their parents.

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