

# Peptic ulcer disease in children

## Çocuklarda peptik ülser hastalığı

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### Abstract

**Background** Data on peptic ulcers in childhood are insufficient. The aim of this study is to define the frequency and characteristics of peptic ulcer disease (PUD) in children and to compare with PUD due to *H.pylori* infection and the others.

**Methods** Pediatric patients that underwent upper gastrointestinal endoscopy between July 2008 and July 2019 were examined. Age, gender, clinical presentation, location of peptic ulcer (PU), presence of *H.pylori* histopathologically and hemoglobine values were recorded for each patient with PUD from the hospital file records. Patients were divided into two groups as patients with PUD associated *H.pylori* and patients with PUD associated with other etiologies. Then two groups were compared.

**Results** Sixty (0.98%) of 6216 patients were diagnosed with PUD. Sixty patients comprised 32 (53.3%) male and 28 (46.6%) female with a mean age of 10.59±4.89 years. The most common complaint was abdominal pain (n=40; %60.6). *H.pylori* was detected in 12 (20%) of 60 patients histopathologically. There was no difference between two groups for age, gender, clinical presentation, anemia or location of PU.

**Conclusion** PUD is a rare disorder in childhood. There is no difference between *H.pylori* related PUD and the others for clinical presentation, anemia or location of PU. For the discrimination of two groups, biopsy should be taken in all patients.

**Key words:** peptic ulcer, children, *H.pylori*

### Özet

**Amaç** Çocukluk çağında peptik ülserlere ilişkin veriler yetersizdir. Bu çalışmanın amacı, çocuklarda peptik ülser hastalığı (PÜH) sıklığını ve özelliklerini saptamak, *H.pylori* ile diğer nedenlere bağlı PÜH' nı karşılaştırmaktır.

**Yöntem** Haziran 2008 ile Haziran 2019 tarihleri arasında endoskopi yapılan pediatrik hastalar incelendi. PÜH olan her hasta için yaş, cinsiyet, klinik bulgular, peptik ülserin (PÜ) yeri, histopatolojik olarak *H.pylori* varlığı ve hemoglobin değerleri kaydedildi. Hastalar *H.pylori*' ye bağlı ve diğer nedenlere bağlı PÜH olarak ikiye ayrıldı. İki grup karşılaştırıldı.

**Bulgular** 6216 hastanın 60'ına (% 0.98) PÜH tanısı konuldu. Altmış hastanın yaş ortalaması 10.59±4.89 yıl olup, 32 (%53.3)' i erkek, 28 (%46.6)' i kızdı. En sık şikâyet karın ağrısıydı (n=40; %60.6). Altmış hastanın 12 (%20)' sinde

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histopatolojik olarak *H.pylori* tespit edildi. İki grup arasında yaş, cinsiyet, klinik bulgular, anemi veya PÜ' in yeri açısından fark yoktu.

**Sonuç** Peptik ülser hastalığı çocuk çağında nadir görülür. *H.pylori* ve diğer nedenlere bağlı PÜH arasında klinik bulgular, anemi ve PÜ' in yeri açısından fark yoktur. İki grubun ayrımı için tüm hastalardan biyopsi alınmalıdır.

**Anahtar kelimeler:** peptik ülser, çocuklar, *H.pylori*

## Introduction

The term peptic ulcer (PU) refers to acid peptic injury of gastrointestinal tract, resulting in mucosal break reaching the submucosa. PUs are usually found in the stomach and duodenum but they can be located in the oesophagus or Meckel's diverticulum. The incidence of uncomplicated PU is approximately one case per 1000 person-years in the general population.<sup>1</sup> It is also less common in children compared with adults.<sup>2</sup> On the other hand, a limited number of studies in children who underwent upper gastrointestinal endoscopy have reported a range of 1.8%-19.5% for prevalence of peptic ulcer.<sup>3</sup>

Traditionally, the most common cause of PU was thought to be a hypersecretory acidic environment together with dietary factors or stress, but discovery of *Helicobacter pylori* (*H.pylori*) infection and common use of non steroidal anti-inflammatory drugs have changed this perception.<sup>4</sup>

*H.pylori* is a flagellated, gram negative micro-aerophilic bacterium that infects over 50% of world's population with higher prevalence in developing countries.<sup>5</sup> Although severe diseases are seen in adults, the infection is usually acquired during childhood.<sup>6</sup> Most of *H.pylori* infections are usually asymptomatic and without clinical manifestation, particularly in poor communities.<sup>7</sup> *H.pylori* has been identified as the primary etiologic agent of peptic ulcer disease (PUD) in children, whereas PUD due to *H.pylori* infection occurs at a rate of approximately 3-25% of infected patients.<sup>8</sup>

The aim of this study is to define the frequency and

characteristics of PU and to compare with PUD due to *H.pylori* infection and the others.

## Methods

In this retrospective study, 6216 pediatric patients that underwent upper gastrointestinal endoscopy between July 2008 and July 2019 were examined. Age, gender, clinical presentation, location of PU, presence of *H.pylori* histopathologically and hemoglobine values were recorded for each patient with PUD from the hospital file records. The patients with chronic gastrointestinal disease like celiac disease or inflammatory bowel disease were excluded from the study.

Anemia was defined as a hemoglobin level two standard deviations below the mean for age.<sup>9</sup>

Patients were divided into two groups as patients with PUD associated *H.pylori* and patients with PUD associated with other etiologies. Then two groups were compared.

## Statistical analysis

Data were analyzed using SPSS version 21.0 (IBM Statistics, Armonk, NY). Quantitative variables were expressed as mean, standard deviation, and minimum-maximum values. Categorical variables were expressed as frequencies and percentages. Differences between groups were calculated using an independent samples t-test for the normally distributed data and the Mann-Whitney test for data not normally distributed. Values of  $P<0.05$  were considered significant. The Chi-square test or Fisher's exact test were used (when chi-square test assumptions do not hold due to low expected cell counts), where appropriate.

Ethics committee approval was not obtained due to retrospective design of the study, and data were based on hospital file records.

## Results

Sixty (0.98%) of 6216 patients were diagnosed with PUD. The 60 patients comprised 32(53.3%) male and 28 (46.6%) female with a mean age of  $10.59\pm 4.89$  years (2-17 years). The most common age range was 15-17 years (n=15; 25%), followed by 12-14 years (n=14;

23.3%) and 2-4 years (n=14; 23.3%), 8-11 years (n=12; 20%) and 5-7 years (n=5; 8.3%).

*H.pylori* was detected in 12 (20%) of 60 patients histopathologically. There is no difference between *H.pylori* positive and negative groups for age and gender (Table 1).

The most common complaint was abdominal pain (n=40; 60.6%). The others were nausea and/or vomiting (n=20; 33.3%) and gastrointestinal bleeding (hematemesis and/or melena) (n=17; 28.3%). At admission, 19 patients (31.6%) were anemic. There is no difference between *H.pylori* positive and negative groups for all

complaints or anemia (Table 1).

Peptic ulcers were most located in antrum (n=38; 63.3%), followed by corpus (n=8; 13.3%), cardia (n=3, 5%) and fundus (n=2, 3.3%). Nine (15%) of the patients had two ulcers in different locations as corpus and antrum (n=7, 11.6%), fundus and corpus (n=1, 1.6%), cardia and corpus (n=1, 1.6%) (Fig. 1). There is no difference between *H.pylori* positive and negative groups for the location of PU (Table 1). Duodenal ulcer was not accompanied by gastric ulcer in any patient.

**Table 1.** Demographic, clinical and endoscopic findings of patients with peptic ulcer

| Characteristics                | <i>H.pylori</i> (+) (n=12) | <i>H.pylori</i> (-) (n=48) | P    |
|--------------------------------|----------------------------|----------------------------|------|
| Mean age± SD (years)           | 11.95±4.77                 | 11.6±5.4                   | 0.09 |
| Gender (M/F)                   | 7/5                        | 25/23                      | 0.37 |
| <b>Location n(%)</b>           |                            |                            |      |
| Cardia                         | 1 (8.3)                    | 2 (4.2)                    | 0.55 |
| Fundus                         | 0 (0)                      | 2 (4.2)                    | -    |
| Corpus                         | 0 (0)                      | 8 (16.6)                   | -    |
| Antrum                         | 9 (75)                     | 29 (60.4)                  | 0.35 |
| Antrum and corpus              | 2 (16.6)                   | 5 (10.2)                   | 0.54 |
| Fundus and corpus              | 0 (0)                      | 1 (2.1)                    | -    |
| Cardia and corpus              | 0 (0)                      | 1 (2.1)                    | -    |
| <b>Presenting symptom n(%)</b> |                            |                            |      |
| Abdominal pain                 | 9(75)                      | 31(64.5)                   | 0.49 |
| Nausea/vomiting                | 5(41.6)                    | 15(31.2)                   | 0.49 |
| Hematemesis/melena             | 2(16.6)                    | 15(31.2)                   | 0.32 |
| <b>Anemia n(%)</b>             | 6 (50)                     | 13(27.1)                   | 0.12 |

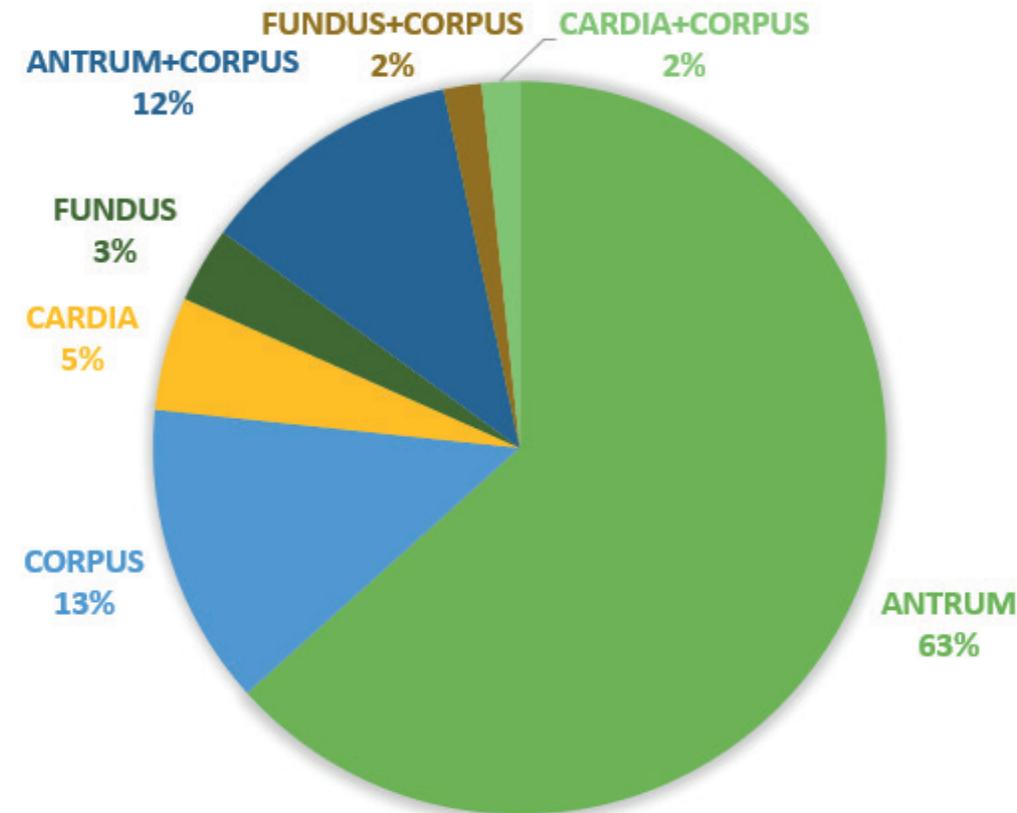


Fig. 1. The locations of peptic ulcers

## Discussion

The prevalence of PUD in children is very low. There are only a few studies about primary PUD. Roma et al. reported PUD in 2% of children.<sup>10</sup> Ecevit et al. found PUD in 3.4% of children who underwent upper gastrointestinal endoscopy for various reasons.<sup>11</sup> In different studies, the ratios were 5.3% and 5%.<sup>12,13</sup> In this study, the ratio was much lower than these studies. This is due to more common use of endoscopy and diagnosis before PUD.

*H.pylori* is the most common cause of PUD in children. In many studies, the association between PUD and *H.pylori* infection has been shown.<sup>4,14</sup> Up to 50% of the gastric ulcers and 80% of the duodenal ulcers are associated with *H.pylori* infection.<sup>15</sup> In a pediatric study, 63% of gastric ulcers were infected with *H.pylori*.<sup>11</sup> In our study, 20% of gastric ulcers were associated with

*H.pylori*. It is much lower than literature. This result may be related to differences in the geographical region or nutrition habits.

Peptic ulcers may present with dyspeptic or other gastrointestinal symptoms, or may be initially asymptomatic and then present with complications such as hemorrhage or perforation. In adult population, complications are seen frequently, whereas in children, upper abdominal pain is the most prominent symptom.<sup>13,16</sup> Approximately 80 percent of patients with endoscopically diagnosed ulcers have epigastric pain.<sup>17</sup> In Ecevit's study, this ratio was 68%.<sup>11</sup> In our study, our results are similar to this study. The other common clinical presentations after abdominal pain were nausea/vomiting and gastrointestinal bleeding like other studies.<sup>11</sup> The difference between *H.pylori* pos-

itive and negative groups was not significant. Therefore, we may suggest that clinical presentation is not specific for *H.pylori* infection.

It was proposed that *H.pylori* infection have a role in the hemostasis of iron stores.<sup>18</sup> In a meta-analysis, *H.pylori*-infected individuals showed increased likelihood of depleted iron stores.<sup>18</sup> In our study, there was no difference between *H.pylori* positive and negative groups for anemia. This result is due to the small number of especially *H.pylori* positive patients.

The most common primary peptic ulcers are *H.pylori* related, although a significant minority are *H.pylori* negative or idiopathic.<sup>19</sup> The severity and depth of *H.pylori* gastritis are various, but generally inflammation is most intense in the antrum, followed by the cardia and the least in the corpus.<sup>19</sup> In our study, the frequency order of ulcer locations were similar to other studies. On the other hand, there is no difference between *H.pylori* positive and negative groups for the location of PU. Antral nodularity may be more important for *H.pylori* related PU rather than the location. Unfortunately, antral nodularity of patients was not recorded. This is the limitation of this study.

In conclusion, PUD is a rare disorder in childhood. There is no difference between *H.pylori* related PUD and the others for clinical presentation, anemia or location of PU. For the discrimination of two groups, gastric biopsy should be taken.

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