

# Peptic ulcer disease in children: An uncommon disorder with subtle symptomatology

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**Background/aims:** Data concerning peptic and infectious ulcers in children are limited. The aim of the study was to investigate the prevalence, presenting symptoms and significance of symptomatology in ulcer diagnosis in the pediatric age group. **Materials and Methods:** Between January 2000 and 2009, upper gastrointestinal endoscopy charts were examined retrospectively. All children in whom a diagnosis of ulcer was established were included in the study. Demographic, clinical, endoscopic, and histopathologic data were obtained from the patients' records. Peptic ulcer disease prevalence, presenting symptoms and symptomatology were evaluated. **Results:** Ulcer disease was observed in 31 (3.4%) of 902 patients. The mean age was  $10.85 \pm 4.25$  (range: 2-17 years), and the male to female ratio was 2:1. The most common symptom was chronic abdominal pain (68%), hematemesis and melena (55%) and vomiting (39%). *Helicobacter pylori* was identified in 19 patients (61%) with ulcer. In the *Helicobacter pylori*-positive group, upper intestinal bleeding and pain were the major symptoms. Symptom frequency was not different between *Helicobacter pylori*-positive and -negative patients ( $p > 0.05$ ). **Conclusions:** Ulcer disease is an uncommon disorder in children with nonspecific clinical symptoms. Unlike the adult population, symptoms fail to diagnose peptic ulcer disease before gastrointestinal bleeding occurs.

**Key words:** Peptic ulcer, children, endoscopy

## Çocukluk çağı peptik ülser hastalığı: Müphem klinik bulgularla seyreden nadir hastalık

**Giriş ve Amaç:** Çocukluk yaş grubunda peptik ve enfeksiyöz ülselerle ilişkili bilgiler yetersizdir. Bu sebeple, çocuk hastalarda peptik ülser hastalığının sıklığı, semptomları ve bu semptomların ülser tanısını öngörmedeki değerinin araştırılması amaçlanmıştır. **Gereç ve Yöntem:** Ocak 2000–2009 yılları arasında Ege Üniversitesi Tıp Fakültesi, Pediatrik Gastroenteroloji, Hepatoloji ve Beslenme Bilim Dalı'nda uygulanan üst gastrointestinal sistem endoskopi raporları retrospektif olarak değerlendirilmiştir. Endoskopi ile peptik ülser hastalığı tanısı alan tüm çocuklar çalışmaya dahil edilmiştir. Olguların demografik, klinik, endoskopik ve histolojik özellikleri hasta dosyalarından elde edilmiştir. Üst gastrointestinal sistem yakınmaları nedeniyle endoskopi yapılan çocuklarda peptik ülser hastalığı sıklığı, başvuru yakınmaları ve semptomların peptik ülser hastalığı ile ilişkisi irdelenmiştir. **Bulgular:** Peptik ülser hastalığı, üst gastrointestinal sistem yakınmaları ile endoskopi yapılan 902 hastanın 31'inde (3,4%) saptandı. Ortalama yaş  $10,85 \pm 4,25$  yıl (2–17 yıl), erkek çocukların kızlara oranı 2,1 bulundu. En sık izlenen yakınmalar sırasıyla, kronik karın ağrısı (68%), hematemez ve/veya melena (55%) ve kusma (39%) olarak izlendi. *Helikobakter pilori* 19 (61%) peptik ülser hastalığı olan olguda saptandı. *Helikobakter pilori*-pozitif grupta üst gastrointestinal sistem kanama ve ağrı temel semptomlardı. *Helikobakter pilori*-pozitif ve negatif ülserli hastalar arasında yakınmalar arasında fark saptanmadı ( $p > 0.05$ ). **Sonuç:** Peptik ülser hastalığı çocukluk yaş grubunda nadir rastlanır ve nonspesifik bulgularla seyretmektedir. Erişkin olguların aksine, çocuklarda klinik semptomlar gastrointestinal sistem kanaması ortaya çıkmadan önce peptik ülser hastalığını öngörmeye yetersiz kalmaktadır.

**Anahtar kelimeler:** Peptik ülser, çocuk, endoskopi

## INTRODUCTION

Peptic ulcer disease (PUD) is an uncommon entity in children. However, with the use of endoscopy,

the diagnosis of pediatric PUD has been reported more frequently (1). In one study, the diagnosis of

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PUD increased three-fold after the introduction of endoscopy (2). *Helicobacter pylori* (*H. pylori*) has been identified as the primary etiologic agent of PUD in children, whereas PUD due to *H. pylori* infection occurs at a rate of approximately 3-25% of infected patients (3).

Despite the new diagnostic tools, studies are difficult to perform due to the low prevalence of the disease. In this study, we aimed to investigate retrospectively the prevalence, presenting symptoms and significance of symptomatology in ulcer diagnosis in the pediatric age group.

## MATERIALS AND METHODS

In this study, a total of 902 cases aged 2-17 years who underwent upper gastrointestinal endoscopy over a period of nine years between January 2000 and January 2009 were evaluated retrospectively. These children were admitted to the Pediatric Gastroenterology, Hepatology and Nutrition Department of Ege University. Data retrieved from the records included age, gender, clinical presentation, endoscopy, *H. pylori* status, and histopathology reports.

Peptic ulcer disease (PUD) was defined as the presence of a clear-cut ulcer in both the stomach and duodenum. Ulcer was defined as a >5 mm mucosal break. A standard forward-viewing 9 mm endoscope was used in the examination. Children were examined under sedation using intravenous midazolam while lying in the left lateral position. In older patients, pharyngeal anesthesia with lidocaine spray was used.

Biopsies were taken for routine histology and identification of *H. pylori*. Every patient who underwent upper endoscopy had at least two duodenal, three antral and two esophageal biopsies that were stained with hematoxylin and eosin and Giemsa stains. Children were considered *H. pylori*-infected if histology was positive. Informed consent was obtained from the patients' parents in all cases.

The Statistical Package for the Social Sciences (SPSS) 15.0 was used for the statistical analysis.

Group parametric (mean) comparisons were tested by the chi-squared or two sample *t* test. Values of  $p < 0.05$  were considered as significant.

## RESULTS

From 1 January 2000 to 1 January 2009, a total of 31 children (3.4%) of 902 presented with upper gastrointestinal symptoms, and primary peptic ulcers were diagnosed. Ages ranged from 2 to 17 years, with a mean age of  $10.85 \pm 4.25$  years. There were 21 boys and 10 girls (2/1). Twenty-two gastric and 9 duodenal ulcers were diagnosed. The median age of children with duodenal ulcer was  $11.1 \pm 4.4$  and with gastric ulcer was  $10.1 \pm 3.8$ .

Three patients (9.7%) were under 4 years of age. Since it is not very reliable to express abdominal pain in younger cases, recurrent abdominal pain was evaluated in patients older than 4 years of age according to the Rome III criteria obtained by parents' review. The major presentation was gastrointestinal chronic abdominal pain in 21/31 (68%) of the children followed by bleeding and vomiting. No significant difference was found regarding clinical manifestations between children with ulcer and non-ulcer disease (Table 1).

*Helicobacter* infestation was identified in 19 of 31 gastric biopsies performed in children with PUD. Twenty-two had gastric ulcers (70%); 14 were *H. pylori*-positive, and 8 (37%) were *H. pylori*-negative. Nine had duodenal ulcers (30%); 5 (55%) were *H. pylori*-positive and 4 were *H. pylori*-negative. The *H. pylori*-positive children were younger than the *H. pylori*-negative children ( $p = 0.08$ ) (Table 2).

The most common histological finding in the *H. pylori*-positive group was gastritis and in the *H. pylori*-negative group was esophagitis (Figures 1, 2).

## DISCUSSION

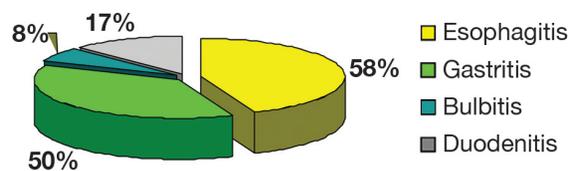
The prevalence of PUD is very low, such that it is not possible to comment regarding the frequency of the disease in the pediatric age group. There are only a few studies regarding primary PUD. Roma

**Table 1.** Clinical features of children with and without peptic ulcer disease

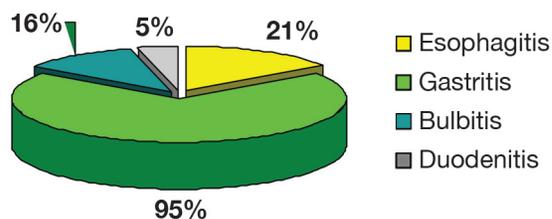
Features	Peptic ulcer (n=31) (%)	Non peptic ulcer (n=871) (%)	<i>p</i>
Abdominal pain	21 (68%)	512 (59%)	0.31
Hematemesis/melena	17 (55%)	99 (11%)	0.01
Nausea/vomiting	12 (39%)	94 (11%)	0.01
Regurgitation/heartburn	7 (22%)	123 (14%)	0.18

**Table 2.** Demographic data and clinical features of 31 children according to *H. pylori* infection

Characteristic	<i>H.pylori</i> - positive (n=19) (61%)	<i>H.pylori</i> - negative (n=12) (39%)	p
Mean age ± SD (years)	10±4.7	12±3.1	0.08
Gender (M/F)	14/5	7/5	0.373
Anatomical location			
Gastric	14 (74%)	8 (67%)	0.67
Duodenal	5 (26%)	4 (33%)	0.67
Presenting symptom			
Abdominal pain	13 (68%)	8 (67%)	0.9
Hematemesis/melena	12 (63%)	5 (42%)	0.24
Nausea/vomiting	7 (37%)	5 (42%)	0.78
Regurgitation/heartburn	5 (26%)	2 (17%)	0.53
Histological findings			
Esophagitis	4 (21%)	7 (58%)	0.21
Gastritis	18 (95%)	6 (50%)	0.004
Bulbitis	3 (16%)	1 (8%)	0.54
Duodenitis	1 (5%)	2 (17%)	0.29



**Figure 1.** Histological findings of children with peptic ulcer disease in *H. pylori*-negative group



**Figure 2.** Histological findings of children with peptic ulcer disease in *H. pylori*-positive group

et al. (4) found PUD in 2% of children. In different studies, the ratios were 5.3% and 5% (5,6). In our study, peptic ulcer was diagnosed in 3.4% of children who underwent upper gastrointestinal endoscopy for various reasons, and these data support the fact that PUD is very rare in the pediatric population as well as the male dominance in this disease (9).

The clinical presentations of PUD differ in children and adults. In the adult population, complications such as bleeding and perforation are the major symptoms, whereas in children, chronic abdominal pain is the usual presentation (10). Nord

et al. (7) and El Mouzan et al. (6) found that chronic abdominal pain was the commonest presentation. In our study, abdominal pain, followed by bleeding and vomiting, was the major symptom in both the ulcer and non-ulcer groups. The difference between the two groups was not significant ( $p>0.05$ ). We therefore may suggest that the presenting feature is not specific for ulcer disease.

Peptic ulcers can be classified as primary or secondary. In children, primary peptic ulcers are usually duodenal, while secondary peptic ulcers are gastric (11). Roma et al. (4) reported their experience of 42 duodenal ulcers in 52 children with PUD. Kato et al. (12) found higher numbers of duodenal ulcers than gastric ulcers. Interestingly, we found more gastric ulcers than duodenal ulcers in our series. Egbaria et al.'s (8) results were similar to ours. The reasons for this difference is unclear but may be related to differences in the ethnic background of the population.

*H. pylori* infection is the commonest cause of the PUD in children (15). A strong association between *H. pylori* infection and PUD has been reported in many studies (13,14). In a meta-analysis, the prevalence of *H. pylori* infection in children with duodenal ulcer was reported as 92% (range: 30-100) (16). In our study, more than half of the children were infected with *H. pylori* in both the gastric ulcer and duodenal ulcer group.

In *H. pylori*-infected children, gastritis is the major histological finding. In *H. pylori*-negative children, duodenitis and esophagitis were found more

commonly. In this study, *H. pylori* gastritis was present in 18 patients (95%). This result was similar to other studies (17,18).

In conclusion, PUD is an uncommon disorder in childhood. Children with ulcer may have more atypical symptoms compared to adults. PUD oc-

curs more commonly in boys and is associated with *H. pylori* antral gastritis. Therefore, an efficient antibacterial eradication regimen will improve the response to treatment and reduce the recurrences.

## REFERENCES

- Goggin N, Rowland M, Imrie C, et al. Effect of *Helicobacter pylori* eradication on the natural history of duodenal ulcer disease. *Arch Dis Child* 1998; 79: 502-5.
- Tam PKH, Saing H, Lau TK. Diagnosis of peptic ulcer in children: the past and the present. *J Pediatr Surg* 1986; 21: 15-6.
- Suerbaum S, Michetti P. *Helicobacter pylori* infection. *N Engl J Med* 2002; 347: 1175-86.
- Roma E, Kafritsa Y, Panayiotou J, et al. Is peptic ulcer a common cause of upper gastrointestinal symptoms? *Eur J Pediatr* 2001; 160: 497-500.
- Mitchell HM, Bohane TD, Tobias V, et al. *Helicobacter pylori* infection in children: potential clues to pathogenesis. *J Pediatr Gastroenterol Nutr* 1993; 16: 120-5.
- El Mouzan MI, Abdullah AM. Peptic ulcer disease in children and adolescents. *J Trop Pediatr* 2004; 50: 328-30.
- Nord KS. Peptic ulcer disease in the pediatric population. *Pediatr Clin North Am* 1988; 35: 117-40.
- Egbaria R, Levine A, Tamir A, Shaoul R. Peptic ulcers and erosions are common in Israeli children undergoing upper endoscopy. *Helicobacter* 2008; 13: 62-8.
- Chan KL, Tam PK, Saing H. Long-term follow-up of childhood duodenal ulcers. *J Pediatr Surg* 1997; 32: 1609-11.
- Chiang B, Chang M, Lin M, et al. Chronic duodenal ulcer in children: clinical observation and response to treatment. *J Pediatr Gastroenterol Nutr* 1989; 8: 161-5.
- Dohil R, Hassall E. Peptic ulcer disease in children. *Baillieres Best Pract Res Clin Gastroenterol* 2000; 14: 53-73.
- Kato S, Nishino Y, Ozawa K, et al. The prevalence of *Helicobacter pylori* in Japanese children with gastritis or peptic ulcer disease. *J Gastroenterol* 2004; 39: 734-8.
- Yeung CK, Yuen KY, Fu KH, et al. Rapid endoscopy room diagnosis of *Campylobacter pylori* associated gastritis in children. *J Pediatr Gastroenterol Nutr* 1990; 10: 357-60.
- Wong BPY, Chao NSY, Leung MWY, et al. Complications of peptic ulcer disease in children and adolescents: minimally invasive treatments offer feasible surgical options. *J Pediatr Surg* 2006; 41: 2073-5.
- Rowland M, Rumm B. *Helicobacter pylori* infection and peptic ulcer disease in children. *Curr Opin Pediatr* 1995; 7: 553-9.
- Macarthur C, Saunders N, Feldman W. *Helicobacter pylori*, gastroduodenal disease, and recurrent abdominal pain in children. *JAMA* 1995; 273: 729-34.
- Blecker U, Gold BD. Gastritis and peptic ulcer disease in childhood. *Eur J Pediatr* 1999; 158: 541-6.
- Sherman PM. Peptic ulcer disease in children. Diagnosis, treatment, and the implication of *Helicobacter pylori*. *Gastroenterol Clin North Am* 1994; 23: 707-25.