

## 급성 복통을 호소하는 환자에서 위장관 점막병변에 관한 연구

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### Gastrointestinal Mucosal Lesions in Children with Short-Term Abdominal Pain

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**Purpose:** The aim of this study was to investigate the spectrum of gastrointestinal mucosal lesions in the children presenting with short-term abdominal pain.

**Methods:** Thirty one children with short term abdominal pain for less than 1 month from January 1995 to May 2004 who were examined using gastrointestinal (GI) endoscopy were reviewed retrospectively. Children presenting with acute abdominal pain unrelated to proper GI were excluded from this study.

**Results:** Male patients were 16 and female were 15. Three patients were 1~5 years old, 15 were 6~10 years old, and 13 were 11~15 years old. The duration of the abdominal pain was less than 7 days in 23 patients, 10 days in 1, 20 days in 2, and 30 days in 4. The major accompanying symptoms were vomiting (15), diarrhea (4), melena (1), hematemesis (1), and fever (2). Using endoscopy, 6 patients were found to have hemorrhagic gastritis, 5 nodular gastritis, 4 duodenal ulcer, 3 gastric ulcer, 3 reflux esophagitis, 2 nodular duodenitis, 2 superficial gastritis, 2 erosive hemorrhagic duodenitis, 2 ulcerative colitis, 1 duodenogastric reflux, and 1 esophageal polyp. *Helicobacter pylori* (*H. pylori*) infection was positive in 10 patients. The age and sex ratio, duration of abdominal pain, site of abdominal pain, and duration of abdominal pain between *H. pylori*-positive and negative children were different. However, only the site of abdominal pain (epigastric) showed statistical significance. All symptoms improved with medication for the GI mucosal lesions noted by the endoscopic findings.

**Conclusion:** The author suggests that GI endoscopy be one of the important first steps in examinations to find out diverse GI mucosal lesions in the patients with short-term abdominal pain. Additionally, the examinations for *H. pylori* infection are important for these patients, also. (**Korean J Pediatr Gastroenterol Nutr 2006; 9: 176~182**)

**Key Words:** Short-term abdominal pain, Children, Gastrointestinal endoscopy, *Helicobacter pylori*

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## INTRODUCTION

There are diverse causes of short-term abdominal pain in children, including surgical or abdominal emergency (appendicitis, intussusception, trauma), intra-abdominal medical diseases (gastroenteritis, constipation, peptic ulcer disease, pyelonephritis, pelvic inflammatory disease), extra-abdominal diseases (pneumonia), systemic diseases (diabetic ketoacidosis, sickle cell anemia).

Recently the importance of gastrointestinal (GI) intestinal endoscopic procedures for short-term abdominal pain has been reported. GI endoscopy examinations are primarily performed for the children presenting with chronic recurrent abdominal pain rather than for acutely developed pain. Until now there have been very few clinical reports about whether GI endoscopy is necessary as a primary examination<sup>1,2)</sup>. Chung et al<sup>3)</sup> reported 32% of all the GI endoscopic examinations were performed in the children with acute abdominal pain in their institute. And Seo<sup>4)</sup> reported that the children with acute epigastric pain were the most common indication for endoscopy. Early GI endoscopy in acute upper abdominal pain results in a high yield of positive findings, permits rapid correction of diagnostic errors and facilitates early management and discharge<sup>5)</sup>.

The purpose of this study was to determine the presence of mucosal lesions in children presenting with acute abdominal pain, which are considered to be caused by GI diseases.

## Materials and Methods

From January 1995 to June 2004, 124 children visited the department of Pediatrics due to short term abdominal pain. The acute abdominal pain for 93 children was found to be caused by a specific disease

or syndrome - Henoch-Schönlein purpura, hepatic disease, pancreatic disease, biliary disease, acute gastroenteritis, urinary tract infection, foreign body ingestion, abdominal trauma, extra-intestinal infection with radiating abdominal pain, psychosomatic or psychiatric diseases, surgical acute abdomen, and genitourinary diseases. These children were excluded from this study. In total, 31 children were reviewed for this study. The durations of the abdominal pain of these children were less than 30 days.

Diverse clinical and laboratory examinations were performed, including CBC, urinalysis, liver function test, stool examination with culture, abdominal x-ray and abdominal ultrasonography, chest x-ray, PPD Skin test, barium meal, barium enema, upper gastrointestinal endoscopy (in 31 cases), colonoscopy (in 9 cases), and examinations for *H. pylori* infection. Special radiologic studies and invasive studies were performed in children with specific symptoms related to upper GI tract (UGI) or lower GI tract (LGI).

Statistical Analysis was performed using Mann-Whitney U test and Fisher's exact test. A *p* value < 0.05 was considered significant.

## RESULTS

### 1. Age and sex distribution

There were 21 male patients, and 10 female patients. Most of the patients (24/31) were 8~14 years old (Fig. 1).

### 2. Duration of abdominal pain

Twenty three patients (74%) had experienced the pain for less than a week; 1 day in 6 patient, 2 days in 7 patients, 3 days in 6 patients, 4 days in one patients, 5 days in 1 patients, and 7 days in 2 patients. The other durations were 10 days in 1 patient, 20 days in 2 patients, and 30 days in 4 patients (Fig. 2).

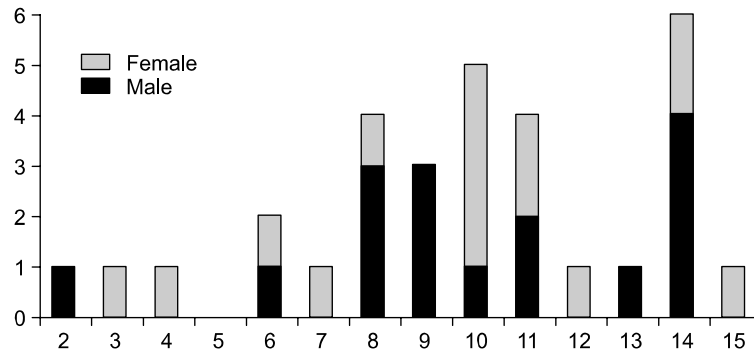


Fig. 1. Age (year) and sex distribution of children with acute abdominal pain.

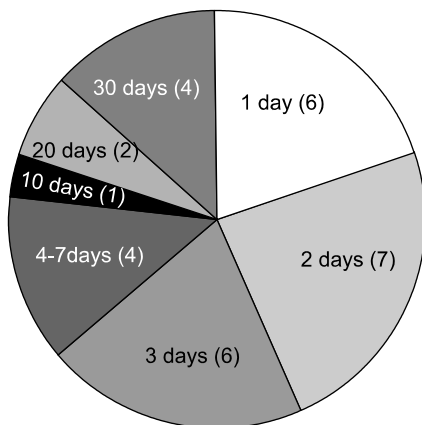


Fig. 2. The duration of the acute abdominal pain (number in the parenthesis: number of patient).

### 3. Site of abdominal pain

Twenty six patients had epigastric pain, 2 had periumbilical pain, and 3 had diffuse abdominal pain (Table 1).

### 4. Accompanying symptoms

Vomiting was the most commonly accompanying symptom (15), Other common symptoms were diarrhea (4), fever (2), melena (1), hematochezia (1), lethargy (1) (Table 2).

Table 1. Site of Abdominal Pain

Site of abdominal pain	No of patients
Epigastric area	26
Periumbilical area	2
Non-localized	3
Total	31

Table 2. Accompanying Symptoms with Abdominal Pain

Symptoms	No. of cases
Vomiting	15
Diarrhea	4
Fever	2
Melena	1
Hematochezia	1
Lethargy	1

### 5. Endoscopic findings

The most common findings of endoscopic examination in the 31 children were hemorrhagic erosive gastritis (6), nodular gastritis (5), duodenal ulcer (4), gastric ulcer (3), reflux esophagitis (3), nodular duodenitis (2), hemorrhagic erosive duodenitis (2), superficial gastritis (2), ulcerative colitis (2), duodeno-gastric

**Table 3.** GI Endoscopic Findings of Children with Acute Abdominal Pain

Endoscopic findings	No. of patients
Hemorrhagic erosive gastritis	6
Nodular gastritis	5
Duodenal ulcer	4
Gastric ulcer	3
Reflux esophagitis	3
Nodular duodenitis	2
Erosive hemorrhagic duodenitis	2
Superficial gastritis	2
Ulcerative colitis	2
Duodenogastric reflux	1
Esophageal polyp	1
Total	31

**Table 4.** The Age and Symptom Duration of *H. pylori* (HP)-positive Children among the Children with Acute Abdominal Pain

Endoscopic findings	No. of patients	No. of patients <i>H. pylori</i> (+)
Hemorrhagic erosive gastritis	6	1
Nodular gastritis	5	2
Duodenal ulcer	4	3
Gastric ulcer	3	3
Reflux esophagitis	3	
Nodular duodenitis	2	
Erosive hemorrhagic duodenitis	2	1
Superficial gastritis	2	
Ulcerative colitis	2	
Duodeno-gastric reflux	1	
Esophageal polyp	1	
Total	31	10

reflux with gastritis (1), esophageal polyp (1)(Table 3).

#### 6. Acute abdominal pain and *H. pylori* infection

Ten children among the 31 were positive for *H. pylori*. The endoscopic findings were duodenal ulcer

**Table 5.** Clinical Characteristics of Acute Abdominal Pain between *H. pylori*-positive Children and *H. pylori*-Negative Children

	<i>H. pylori</i> -positive children (n=10)	<i>H. pylori</i> -negative children (n=21)
Mean age (year)	9.5±3.47*	8.7±3.44*
Mean duration of short term abdominal pain	7±9.79 <sup>†</sup>	8.62±10.52 <sup>†</sup>
Male : Female	6 : 4 <sup>‡</sup>	10 : 11 <sup>‡</sup>
Epigastric pain	10 (100%)	16 (76.2%) <sup>§</sup>

*p* value: \* > 0.05, <sup>†</sup> > 0.05 (Mann-Whitney U test), <sup>‡</sup> > 0.05 (Fisher's exact test), <sup>§</sup> < 0.05 (Mann-Whitney U test)

(3), Gastric ulcer (3), nodular gastritis (2), hemorrhagic erosive gastritis (1), and hemorrhagic erosive duodenitis (1). Nine of the *H. pylori*-positive children were 7~14 years old. One was 2 years old. The durations of the abdominal pain in *H. pylori*-positive children were 3 days in 4 children, 2 days in 3 children, 5 days in 1 child, 20 days in 1 child, and 30 days in 1 child (Table 4).

The mean age between *H. pylori*-positive children and *H. pylori*-negative children was 9.5 years old and 8.7 years old. The mean duration of abdominal pain between these two groups were 7 days and 8.6 days. The sex ratios (M : F) were 6 : 4 and 10 : 11. The *H. pylori*-positive children had epigastric pain in all cases, and the *H. pylori*-negative children had epigastric pain in 76.2% of the cases. Despite some differences between *H. pylori*-positive and negative children, there was no statistical significance except in epigastric pain only (*p* < 0.05)(Table 5).

#### 7. Clinical improvement after medication

All the children were treated with appropriate therapeutic medicines for the diagnosed disease (H2 blockers and antacids for gastritis or duodenitis, proton

pump inhibitors for reflux esophagitis or peptic ulcers, triple or quadruple therapy for *H. pylori* infection, 5-ASA or corticosteroids for ulcerative colitis), and all children showed clinical improvement of abdominal pain.

## DISCUSSION

In pediatric patients with acute or subacute abdominal pain, the differential diagnoses vary depending primarily on the age of the child. Plain films are helpful in 6-month to 3-year-old children, and demonstrate the features of bowel obstruction and generalized ileus with gastroenteritis. In older child, causes of acute abdominal pain other than appendicitis requiring an operation are rare<sup>6</sup>. Before the 1970s, the physician faced with a child presenting with abdominal pain was limited primarily to contrast radiographic studies and ultrasound for the differential diagnosis. The development of effective and safe pediatric endoscopic procedures has significantly improved the diagnostic capabilities of physicians<sup>7,8</sup>. GI endoscopy is the preferred procedure when GI mucosal lesions are suspected, whereas motility disorders and anatomical abnormalities of the hollow viscera are best pursued with radiologic procedures. Recently the importance of intestinal endoscopic procedures for acute abdominal pain has been reported. Most pediatric gastroenterologists perform GI endoscopy primarily for children presenting with chronic recurrent abdominal pain rather than for acutely developed pain. The most common candidates for GI endoscopy are those presenting with chronic or recurrent abdominal pain (RAP) and GI-specific symptoms and signs for more than 3 months' duration. In most case the parents do not permit the endoscopic procedure for the acute stage of abdominal pain, but tend to suggest more observation of the courses of the abdominal pain. The author has even usually recommended GI endoscopy mainly for chil-

dren with chronic abdominal pain before this study. There are few clinical reports regarding the importance and necessity of gastrointestinal endoscopy as a primary examination in acute abdominal pain. The children in this study had no previous attack of abdominal pain in the past. This result of this study encourages doctors of the author's hospital to perform GI endoscopy as a primary procedure in children presenting with severe acute abdominal pain who have probably GI mucosal diseases.

Astegiano et al<sup>9</sup>) measured intestinal wall thickness and recommended further GI endoscopy to patients with thick intestinal wall, and suggested the diagnostic role of intestinal ultrasound examination as a first diagnostic tool in young patients without clear symptoms or signs of organic diseases, and as an indication tool for subsequent invasive tests. However, GI endoscopy in harmony with radiology procedures should be used effectively to establish a definite diagnosis in patients with a strong possibility of GI mucosal diseases<sup>10</sup>.

In this study, one third of the cases was *H. pylori*-positive, and showed *H. pylori*-associated GI mucosal diseases. The evidence for a causal relationship between *H. pylori* infection and RAP in children has been discussed<sup>11~13</sup>. It was a surprise to find out that children with *H. pylori*-associated GI mucosal lesion could present with acute abdominal pain as well as with chronic abdominal symptoms. In the study by Yang et al<sup>14</sup>), seropositive *H. pylori* infection was more commonly found in children with short term (duration of 1~3 months) RAP rather than chronic recurrent abdominal pain, and presentation of epigastric pain was significantly higher in children with *H. pylori* infection. However, this result originated from serologic study, not from GI mucosal findings. The *H. pylori*-positive children in my study showed epigastric pains in all cases, and were statistically significant. In a study by Na and Seo<sup>15</sup>), 70 among 166 patients (42%)

with RAP were *H. pylori*-positive. One-third children of short-term abdominal pain in this study were *H. pylori*-positive, but a larger number of cases are required for statistical significance regarding *H. pylori* infection between acute and chronic abdominal pain. Two children were diagnosed with ulcerative colitis. This is unique. Patient with ulcerative colitis usually present with chronic abdominal pain and other abdominal symptoms. There are very few reports about patients with ulcerative colitis presenting with acute abdominal pain. Szybejko et al<sup>16)</sup> reported a case of ulcerative colitis with acute abdominal pain as a main symptom.

In conclusion, early GI endoscopy in children with short-term acute abdominal pain who are expected to have proper GI mucosal diseases results in a high yield of positive findings, permits rapid correction of diagnostic errors and facilitates early management and discharge. Examinations to determine the presence of *H. pylori* infection are also important for further differential diagnosis.

## 요 약

**목 적:** 급성 복통을 주소로 내원한 소아 환자에서 위장관 내시경검사상 위장관 점막 병변을 조사하고 위장관 내시경 검사의 유용성을 알고자 본 연구를 시행하였다.

**방 법:** 1995년 1월부터 2004년 5월까지 한양대학 병원에 급성복통을 주소로 내원하여 진료받은 환아들 중 내시경 검사를 받은 위장관 점막 고유의 질환으로 간주된 환자 31명을 후향적으로 조사하여 성별 및 나이의 분포, 복통의 기간, 동반증상, 복통의 부위, 위장관 내시경 검사상 점막 병변의 종류, *Helicobacter pylori* (*H. pylori*) 양성 환자의 유무 및 양성 환아들의 복통의 특성 등에 관해 조사하였다.

**결 과:** 남아가 16명, 여아가 15명이었으며 6~10세 환아가 15명으로 가장 많았고 그 다음이 11~15세 환아였다. 복통의 기간은 1주 이하가 23명으로

가장 많았다. 동반된 증상은 구토(15예), 설사(4예), 혈변(2예), 발열(2예) 등이었다. 위장관 내시경 검사 소견으로는 급성 출혈성 위염(6명), 결정성 위염(5명), 십이지장 궤양(4명), 위궤양(3명), 역류성 식도염(3예), 결절성 십이지장염(2예), 표재성 위염(2명), 궤양성 대장염(2명), 미란성 십이지장염(2명), 식도 용종(1명), 십이지장위역류(1명) 등이었다. 10명의 환아가에서 *H. pylori*가 양성이었다. *H. pylori*가 음성인 환아들과 비교하여 복통의 기간, 환아의 연령, 성별의 차이는 있었으나 통계학적 의의는 없었고 *H. pylori* 양성 환자 모두에서 복통의 위치가 심와부라는 것에 대해서는 통계학적 의의가 있었다. 위장관 내시경 검사를 받고 위장관 점막 질환에 대한 치료를 받은 환아들 전체에서 증상의 호전이 관찰되었다.

**결 론:** 급성 복통은 원인이 다양하다. 급성 복통에서 점막 병변의 조기진단을 위해 위장관 내시경 검사가 우선적 검사로서 중요하며, 급성 복통 시에도 *H. pylori* 위장관 감염에 대해서 관심을 가지는 것이 감별진단에 도움이 된다.

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