Upper Gastrointestinal Endoscopy in Children with Recurrent Abdominal Pain

PRAPUN AANPREUNG, M.D.*, KANIT ATISOOK, M.D.**,
PAVINEE SUWANAGOOL, M.D.**, CHIRASRI VAJARADUL, M.D.*

Abstract

Over a 3 year period from 1992 to 1995, 62 patients with recurrent abdominal pain (RAP) underwent upper gastrointestinal endoscopy showing normal findings in 30 patients (48.4%), gastroduodenitis 17 (27.4 %), *H. pylori* gastritis 11 (17.7%) and esophagitis 4 (6.5%). Duodenal or gastric ulcer was not found. This study demonstrated more evidence of increased prevalence of organic causes of RAP than previous reports. Duration of illness of more than one year and vomiting were more common in *H. pylori* gastritis. Other symptoms including diarrhea, constipation, nocturnal awakening and pain related to meals could not differentiate between organic and functional cause. Major cases of *H. pylori* gastritis and gastroduodenitis responded to triple drug therapy and H_2 blockers respectively.

Recurrent abdominal pain (RAP) has been reported to be the most common chronic gastrointestinal problem of school-aged children and young adolescents in both developed and developing countries. In 90 to 95 per cent of children with RAP, no organic cause of the pain is identified and children are considered to have a functional disorder[1-4]. Studies of RAP's natural history indicate that symptoms spontaneously remit in 30 to 50 per cent of cases within 2 to 6 weeks after diagnosis[5]. However, approximately 30 to 50 per cent continue to have abdominal pain persisting to adulthood[6].

Only 10 per cent of children with RAP have organic pathologies and psychosomatic symptomatology. Because of progress in performing fibre-optic endoscopy in pediatrics and recent interest in *Helicobacter pylori* (Hp) related to peptic ulcer, organic pathologies are increasingly being found[7-9]. The aim of this study is to demonstrate upper gastrointestinal endoscopic findings and related symptoms in Thai children with RAP.

MATERIAL AND METHOD

Over a 3 year period from 1992 to 1995, sixty two children with RAP were seen and under-

* Department of Pediatrics,
** Department of Pathology, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

went upper gastrointestinal endoscopy. RAP is characterized by at least three attacks of pain, severe enough to affect routine activities and occuring over a period of more than 3 months. Liver function tests, amylase, abdominal ultrasound and upper GI series were carried out in some suspected cases. Chronic constipation, urinary tract infection and lactose intolerance were not included in this study. The endoscope was passed to the upper part of the duodenum and biopsies were obtained from the first part of the duodenum, antrum, gastric body and lower esophagus. Two specimens from the antrum were used for rapid urease test (CLO test for *H. pylori* infection) and histology. In some patients, the third specimen from the antrum was obtained for *H. pylori* culture. Specimens were stained with hematoxylin and eosin (HE) and some were stained with giemsa or warthin-starry silver method to demonstrate Hp like organisms. Children were considered to be infected by *H. pylori* if either bacteriological culture or both CLO test and *H. pylori*-like organisms in the histology was positive. The Kruskal - Wallis 1 - Way ANOVA was used in statistical analysis.

RESULTS

Of 62 children with RAP, upper gastrointestinal endoscopy showed normal macroscopic or microscopic findings in 30 patients (48.4%), gastroduodenitis in 17 (27.4%), *H. pylori* gastritis in 11 (17.7%) and esophagitis in 4 (6.5%). There was no duodenal ulcer or gastric ulcer demonstrated in this study. The patients having *H. pylori* gastritis had positive urease test in 10 out of 11 tests, but a negative case had positive culture and *H. pylori*-like organisms in the histology. Culture for *H. pylori* were positive in 3 out of 5 cases. The children in this group had a longer illness and more vomiting than those of other groups ($P < 0.05$). Other symptoms including diarrhea, nocturnal awakening, pain related to meals and constipation were not different between each group (Table 1.).

DISCUSSION

Since the introduction of flexible fibreoptic endoscopy in the early 1970s, it has become an established procedure for the diagnosis, evaluation and treatment of gastrointestinal disease in pediatric patients[10,11]. Upper endoscopy is frequently performed to find out the etiology of RAP in children in tertiary hospitals. From the literature, organic causes of RAP are less than 10 per cent but recent data by performing upper endoscopy demonstrated more abnormal findings. Quak et al (1988) reported duodenal ulcer (5) and esophagitis (3) of 32 pediatric patients[9]. Mavromichalis (1992) showed 93 per cent of 72 patients having organic pathologies including gastritis and duodenitis[8]. Furthermore, Ashorn (1993) found 58.5 per cent of 82 patients having abnormal pathologies[7]. Our study supports previous data by demonstrating organic pathologies (51.6%) including, gastroduodenitis, *H. pylori* gastritis and esophagitis, but major findings were microscopic inflammation.

Primary peptic ulcer can cause recurrent abdominal pain in both children and adolescents but prevalence of this disease is low. Peptic ulcer was not found in this data which may be related to race and the age-group of patients being below

Table 1. Characteristics and symptoms of children with RAP.

Characteristics and symptoms	Normal (N=30)	Gastroduodenitis (N=17)	*H. pylori* gastritis (N=11)	Esophagitis (N=4)	P
Sex (M/F)	16/14	6/11	2/9	2/2	
Age (mean±2SE) (yr)	8.7±0.8	8.9±0.9	10.5±1	7.7±2.4	
Duration (mean±2SE) (M)	7.3±2.8	9.5±3.8	16.2±6.4	12.8±8.6	< 0.05
Vomiting	11 (36.6 %)	7 (41.2 %)	9 (81.8 %)	2 (50 %)	< 0.05
Diarrhea	5 (16.6 %)	2 (11.8 %)	3 (27.2 %)	-	N
Nocturnal awakening	7 (23.3 %)	8 (47 %)	7 (63.3 %)	1 (25 %)	N
Pain related to meals	12 (40 %)	10 (58.8 %)	7 (63.3 %)	3 (75 %)	N
Constipation	5 (16.7 %)	1 (5.8 %)	3 (27.2 %)	-	N

12 years. In addition, *H. pylori* infection did not increase prevalance of peptic ulcer disease in children as in adults. Esophagitis was not common in our data. Its symptom is chest pain, or heart burn rather than abdominal pain, so major cases may not be seen by gastroenterologist.

There was controversial data in the incidence of *H. pylori* infection in symptomatic and asymptomatic children[12-15]. Oderda et al found that 63 per cent of children with RAP had evidence of active *H. pylori* infection[16] while Ashorn et al found this in 22 per cent of selected patients[7]. The prevalence of *H. pylori* gastritis (17.7) in our study was not higher than asymptomatic school age Thai children (17.1%)[17]. Although it could not be concluded that *H. pylori* infection was related to abdominal pain, the symptoms were improved after treatment with triple drug therapy (bismuth subcitrate, amoxicillin, metronidazole). Gastroduodenitis was the major finding in this data, mostly microscopic abnormalities. The etiology of this inflammation was not known. History of taking NSAID or alcohol was not present except for spicy food in some cases. The symptoms improved after taking H_2 blocker for 6 - 8 weeks in major cases. The role of microscopic inflammation in pathogenesis of RAP in children and non-ulcer dyspepsia in adults is controversial[18-21]. It has been speculated that such low grade inflammation may be the cause or the effect of altered intestinal motility. In cases having normal findings, the etiology of pain was unknown. Abnormal intestinal motor activity and dysfunction of the autonomic nervous system may play a role in the pathogenesis[22-26].

Comparing symptoms and duration of illness between each group, vomiting and duration of illness of more than 1 year were common in *H. pylori* gastritis. This infection can cause chronic inflammation of both stomach and duodenum resulting in abnormal motility. Vomiting was suspected to be the effect of this pathology. Symptoms suggesting organic etiologies such as nocturnal awakening and pain related to meals could not differentiate between funtional and organic causes. The precise indication for performing upper endoscopy in RAP is not well established. We prefer to do this in a case having intractable pain, weight loss, longer duration of illness and anxious parents. Upper GI study may be performed if endoscopy is not available.

(Received for publication on February 22, 1996)

REFERENCE

1. Apley J. The child with abdominal pain. London: Blackwell Scientific Publications, 1975.
2. Galler JR, Neustein S, Walker WA. Clinical aspects of recurrent abdominal pain in children. Adv Pediatr 1980; 27: 31-53.
3. Sticker GB, Murphy DB. Recurrent abdominal pain. Am J Dis Child 1979; 133: 486-9.
4. Stone RJ, Barbero GJ. Recurrent abdominal pain in childhood. Pediatrics 1970; 45: 732-8.
5. Boyle JT. Chronic abdominal pain. In : Walker WA, Durie PR, Hamilton JR. Walker - Smith JA, Watkins JB, eds. Pediatric gastrointestinal disease. Philadelphia, PA : BC Decker, 1991: 45-54.
6. Apley J, Hale B. Children with recurrent abdominal pain : how do they grow up ? BMJ 1973; 3: 7-9.
7. Ashorn M, Maki M, Ruuska T, et al. Upper gastrointestinal endoscopy in recurrent abdominal pain of childhood. J Pediatr Gastroenterol 1993; 16: 273-7.
8. Mavromichalis I, Zanaramboukas T, Richman PI, Slavin G. Recurrent abdominal pain of gastrointestinal origin. Eur J Pediatr 1992; 151: 560-3.
9. Quak SH, Low PS, Wong HB. Upper gastrointestinal endoscopy in children with abdominal pain. Ann Acad Med Singapore 1985; 14: 614-6.
10. Ament ME, Berquist WE, Vargas J, Perisic V. Fiberoptic upper intestinal endoscopy in infants and children. Pediatr Clin North Am 1988; 25: 141-55.
11. Ament ME, Christie DL. Upper gastrointestinal fiberoptic endoscopy in pediatric patients. Gastroenterology 1977; 72: 1244-8.
12. Blecker H, Hauser B, Lanciers S, et al. The prevalence of Helicobacter pylori positive serology in asymptomatic children. J Pediatr Gastroenterol Nutr 1993; 16: 252-6.
13. Cadranel S, Goossens H, De Boeck M, et al. Campylobacter pyloridis in children. Lancet 1986; 1: 735-6.
14. Oderda G, Vaira D, Holton J. Age - related increase of Helicobacter pylori frequency in symptom free and in dyspeptic children. Lancet 1992;

340: 371-2.
15. Radhakrishnan S, al Nakib B. Kalaoui M, Patric J. Helicolacter pylori associated gastritis in Kuwait : endoscopy based study in symptomatic and asymptomatic children. J Pediatr Gastroenterol Nutr 1993; 16: 126-9.
16. Oderda G, Vaira D, Holton J, et al. Serum pepsinogen I and IgG antibody to Campylobacter pylori in non - specific abdominal pain in chilhood. Gut 1989; 30: 912-6.
17. Perez - Perez GI, Tayler DN, Bodhidatta I, et al. Seroprevalence of Helicobacter pylori infections in Thailand. J Infect Dis 1990; 161: 1237-41.
18. Bo-Linn GW, Vendrell DD, Lee E, Fordtran JS. An evaluation of the significance of microscopic colitis in patients with chronic diarrhea. J Clin Invest 1985; 75: 1559-69.
19. Elliot PR, Williams CB, Lennard - Jones JE, et al. Colonscopic diagnosis of minimal change colitis in patients with normal sigmoidoscopy and normal air-contrast barium enema. Lancet 1982; 1: 650-1.
20. Heyman MB, Perman JA, Ferrell LD, Thaler MM. Chronic nonspecific inflammatory bowel disease of the cecum and proximal colon in children with grossly normal appearing colonic mucosa; diagnosis by colonoscopic biopsies. Pediatrics 1987; 80: 255-61.
21. Talley NJ. Phillips SF. Non-ulcer dyspepsia : potential causes and patho physiology. Ann Intern Med 1988; 108: 865-79.
22. Dimson SB. Transit time related to clinical findings in children with recurrent abdominal pain. Pediatrics 1972; 47: 666-74.
23. Kopel FB, Kim IC, Barbero GJ. Comparison of rectosigmoid motility colitis. Pediatrics 1967; 39: 539-44.
24. Pineiro-Carrero VM, Andres JM, Davis RH, Mathias JR. Abnormal gastroduodenal motility in children and adolescents with recurrent functional abdominal pain. J Pediatr 1988; 113: 820-5.
25. Andrews PLR. Vagal afferent innervation of the gastrointestinal tract. Prog Brain Res 1986; 67: 65-86.
26. Rubin LS, Barbero GJ, Sibinga MS. Pupillary reactivity in children with recurrent abdominal pain. Psychosom Med 1967; 26: 111-20.

การส่องกล้องทางเดินอาหารส่วนต้นในเด็กที่ปวดท้องเรื้อรัง

ประพันธ์ อ่านเปรื่อง, พ.บ., คณิต อธิสุข, พ.บ.**,*
*ภาวิณี สุวรรณกูล, พ.บ.**, จิราศรี วัชรดุลย์, พ.บ.**

ช่วงระยะเวลา 3 ปี ตั้งแต่ พ.ศ. 2536 – 2538 ผู้ป่วยเด็กที่มีปัญหาปวดท้องเรื้อรังจำนวน 62 ราย ได้รับการตรวจโดยการทำ gastrointestinal endoscopy และพบว่ามีผลปกติ 30 ราย (46.4 %), gastroduodenitis 17 ราย (27.4 %), *H. pylori* gastritis 11 ราย (17.7 %) และ esophagitis 4 ราย (6.5 %) โดยไม่พบ duodenal ulcer หรือ gastric ulcer การศึกษานี้ช่วยสนับสนุนข้อมูลที่กล่าวว่าจะพบ pathology ที่ผิดปกติของทางเดินอาหารส่วนต้นในผู้ป่วยเด็กปวดท้องเรื้อรังได้เพิ่มมากขึ้นกว่าที่เคยรายงานไว้ ระยะเวลาของการปวดท้องเป็น ๆ หาย ๆ นานกว่า 1 ปี และอาการอาเจียนจะพบได้บ่อย ใน *H. pylori* gastritis ส่วนอาการอุจจาระร่วง, ท้องผูก, ปวดท้องเวลากลางคืนหลังจากนอนหลับและปวดที่สัมพันธ์กับอาหารไม่สามารถช่วยแยก organic cause จาก functional cause ได้. ผู้ป่วยที่มี *H. pylori* gastritis และ gastroduodenitis ส่วนใหญ่จะตอบสนองต่อการรักษาด้วย triple drug therapy และ H_2 blocker ตามลำดับ

* ภาควิชากุมารเวชศาสตร์,
** ภาควิชาพยาธิวิทยา, คณะแพทยศาสตร์ศิริราชพยาบาล, มหาวิทยาลัยมหิดล, กรุงเทพมหานคร 10700