Peptic Ulcer Disease in Children: Report of a Case and a Problem-Oriented Review

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The family physician who sees many children with vague abdominal pain must include peptic ulcer disease in the differential diagnosis. A case report is presented and the characteristics of primary and secondary ulcers in children are reviewed with respect to symptoms, signs, diagnosis, and treatment. Ulcers in children may be primary or secondary (stress) ulcers. Clinical and radiographic diagnosis is difficult. Medical therapy suffices in most cases, but there is a high recurrence rate in adolescence and adulthood. Peptic ulcer disease in children is a diagnostic dilemma, but the family physician may be in an excellent position to make the diagnosis since he/she is often the first physician to see the patient and is aware of altered family dynamics, which may play a role in this disease.

How many children complaining of vague abdominal pain does the family physician see in an average week—five to ten? Certainly, most of these children are found to have "functional pain" or mild gastroenteritis, and require little treatment other than understanding, tender loving care, and perhaps some clear liquids. Some children with such complaints, however, turn out to have significant disease, as illustrated by the following patient.

Case Report

A six-year-old, previously well, 39 lb, black girl complained to her parents of vague generalized abdominal pain unrelated to meals, bowel movements, apparent emotional stresses, or other factors. There was no vomiting, nausea, constipation, or diarrhea. Her past medical history and family history were negative. She belonged to a middle class family, with a concerned mother and father and one younger healthy sibling, all of whom accompanied the child to the office on her initial visit. Physical examination revealed only a somewhat quiet, shy, small child (third percentile for weight, 25th percentile for height), who was afebrile and did not appear ill. The head, ears, eyes, nose, and throat were normal and the chest and heart were normal to auscultation. The abdomen was soft without masses, tenderness, or hepatosplenomegaly. Bowel sounds were normal. Gentle digital rectal examination revealed soft brown guaiac negative stool. A diagnosis of functional pain was made and it was decided to observe the child without further treatment. The pain resolved spontaneously. She was not seen again by a physician until three months later when she again complained of vague abdominal pain. The same family physician saw her, again noting that she was accompanied by both parents, who seemed almost excessively concerned with the child's welfare. The examination was still nega-

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tive, but because of the recurrence of pain a complete blood count was done which surprisingly revealed a hemoglobin of 6.7 gm/100 ml and a hematocrit of 22.3 percent. The white blood cell count was 5,000 per cu mm with a normal differential, and red blood cell indices revealed a marked microcytosis and hypochromia. Urinalysis was normal. The stool remained guaiac negative and was negative for ova and parasites on three examinations. A sickle cell test revealed sickle cell trait with hemoglobin AS.

On further questioning the child's parents now stated that she was a somewhat anxious perfectionistic child who did not do very well in school and seemed to worry about this a great deal. The parents stated that they did not drive the child too hard, but admitted that they expected her to make good grades. They also stated that the child's younger male sibling was quite active, and "aggravated" the patient a great deal.

Because of the anemia and abdominal pain, tests for serum iron and total iron binding capacity (TIBC) were performed and an upper gastrointestinal series (UGI) was scheduled. Serum iron level was 13 mg/100 ml with a TIBC of 380 μ/100 ml. Upper gastrointestinal series demonstrated a benign appearing antral gastric ulcer. A diagnosis of gastric ulcer and iron deficiency anemia secondary to occult gastrointestinal bleeding was made. Gastroenterology consultants agreed with antacid and iron therapy, with close follow-up of the ulcer by frequent UGI series, and gastroscopy if the ulcer did not heal adequately.

With antacid and iron therapy the child improved steadily. After three weeks of therapy, she had gained 3 lb, her hemoglobin had risen from 6.7 to 9.6 gm/100 ml, and a repeat UGI series demonstrated a healing ulcer. One month later the hemoglobin had risen to 12.6 gm/100 ml with hematocrit 35.7 percent, and red blood cell indices were normal. By this time the child had gained 4 lb and was subjectively without symptoms; her parents noted a much happier, playful child, and her teachers noted marked improvement in her school performance. The parents were counseled about demanding too much of the child, and advised to pay more attention to peacemaking efforts between the children. They were warned about the possibility of recurrence of the disease, and agreed to bring the child in regularly for follow-up care to include family counseling when necessary.

This case demonstrates that peptic ulcer disease indeed does occur in childhood and must be differentiated from the myriad of other problems that can present to the family physician as abdominal pain in children.

Problem-Oriented Review

It is useful to examine this disease through a problem-oriented method, ie, to examine the subjective symptoms, the objective findings, the assessment and differential diagnosis, and the plan for treatment, including patient education and prognosis.

Incidence

A survey of 29 hospitals showed about two cases per hospital per year of peptic ulcer disease in children.[1] Other investigators have reported that the incidence is recently increasing, and even some older studies stated that the incidence of peptic ulcer disease in children was as high as 11.8 percent.[2] In the Virginia study,[3] encompassing a two-year period from 1973 to 1975, 82 family practice residents and 36 practicing family physicians documented 33 cases of gastric or duodenal ulcers in children 14 years or younger. Perhaps the recognition of the disease is increasing secondary to physician awareness, or perhaps estimates of incidence vary so considerably because it is such a difficult diagnosis to make, both clinically and radiographically. The male-to-female ratio is about 1.3-2:1. The disease is most common in the 12-to-18-year-old age group.

Types of Ulcers

Ulcers in children are of two types: primary and secondary. The cause of primary ulcers is unknown; they occur most commonly in older children and are located in the duodenum six times more commonly than in the stomach. When a primary ulcer does occur in a child less than six years old, however, it usually involves the stomach rather than the duodenum. Secondary (stress) ulcers are more common in infants and young children. They are secondary to extensive burns, sepsis, meningitis, respiratory distress syndrome, or central nervous system disease. They occur with about equal frequency in the stomach and duodenum and account for as many as 80 percent

Table 1. Characteristics of Types of Peptic Ulcers in Children

Type	Age	Location	Cause
Primary ulcer	Infants and young children (<3 years old)	Gastric>duodenal	Unknown
	Older children (common)	Duodenal:gastric=6:1	? Anxiety
Secondary (stress) ulcer	Infants and young children (common)	Duodenal=gastric	Respiratory distress syndrome, sepsis, meningitis
	Older children	Duodenal=gastric	Drugs, sepsis, central nervous system disease

(>more often than)
(=equally as often as)

of peptic ulcers in infants. In older children these ulcers are associated with drug treatment (aspirin, indomethacin, immunosuppressives, and steroids), sepsis, or central nervous system disease (Table 1).

Subjective

Primary ulcers often occur in tense, anxious, compulsive children. Preschool children with ulcers complain of generalized vague abdominal discomfort usually relieving spontaneously and not related to meals, thus making it difficult to differentiate them from children with functional pain or gastroenteritis. Nocturnal pain is an important symptom and vomiting is also very common. In older children, symptoms are similar to those in adults, that is, pain occurs one to two hours after meals and is relieved by antacids. In primary peptic ulcer disease, bleeding occurs in 60 or 65 percent of the cases. This bleeding is in the form of hematochezia of melena in 30 to 50 percent, and presents as occult bleeding in another 10 to 15 percent.[4,5] No bleeding, gross or occult, occurs in as many as 35 percent of patients. It is, therefore, not surprising that the patient presented above had negative stools for occult blood though some bleeding was present, as evidenced by the iron deficiency anemia. Almost all children with secondary peptic ulcer disease will bleed, but fewer will have acute pain.

Ulcers occur in other family members in 20 percent[4] or as many as 65 percent[6] of patients; there is a higher incidence in monozygous than dizygous twins; and emotional factors undoubtedly contribute. There is a higher incidence in passive, overdependent children with overprotective mothers.[4] Because of these factors the family physician is in an ideal position to make the diagnosis since he/she is familiar with the family history and family dynamics.

Objective

The x-ray diagnosis is difficult to make, often requiring repeat films if the diagnosis is strongly suspected. Duodenal scarring is presumptive evi-

dence of an ulcer when a clinical history and a response to treatment is found.[1] Gastric analysis is unrewarding as a diagnostic measure,[4,7] and basal acid output (BAO) correlates poorly with x-ray findings, unless the rare Zollinger-Ellison syndrome is suspected. Basal acid output may be valuable as a follow-up test after surgery for the Zollinger-Ellison syndrome. Gastroscopy is a valuable diagnostic tool for patients who are unimproved after acceptable medical therapy. Gastric cancer in children is so rare that a lesion can be assumed benign and therapy initiated, with only those lesions which do not improve rapidly requiring evaluation endoscopically and with biopsy techniques.

Assessment

As noted above, the main differential diagnoses are gastroenteritis and functional abdominal pain. Other considerations are hereditary causes of gastrointestinal bleeding, hemangioma and telangiectasia, multiple polyposis of the colon, benign tumors, and many others.

Plan

1. Therapeutic plan

Medical therapy is the treatment of choice. Aluminum hydroxide and magnesium hydroxide combination drugs (Mylanta and Maalox) are effective in a dose of 10 to 15 cc per hour for two to three weeks, then every two or three hours. These drugs can be alternated with aluminum hydroxide products (Gelusil and Amphogel) if diarrhea becomes a problem. Antispasmodic medicine, such as propantheline bromide (Pro-Banthine) 7.5 to 15 mg three times a day before meals, may enhance the therapeutic regimen. Cimetidine, the new H-2 receptor inhibiting agent, is not yet approved for use in children because of insufficient studies in this age group. Treatment should continue for three months and then a repeat upper gastrointestinal series should be done with gastroscopy performed if the ulcer does not show signs of healing. Surgical treatment is necessary in only about 7.5 percent of patients.[8] Surgery is necessary for the same indications as in adult patients: uncontrolled bleeding, perforation, pyloric obstruction, or intractable pain. Often these complications develop because the diagnosis is made very late. Vagotomy and pyloroplasty is the surgical treatment of choice in primary ulcer disease.[9,10] A secondary ulcer usually requires less extensive surgery, since often only a perforation is present and also since these ulcers do not characteristically recur. Total gastrectomy is necessary in the rare Zollinger-Ellison syndrome, as is the case in adults.

2. Patient education and prognosis

Fifty to 70 percent of primary ulcers recur in adolescents or adults despite therapy.[4,11] This is another area in which the family physician must use expertise in family medicine as coordinator of the family's health care. As the family's health advisor he/she may continue to remind patients to avoid ulcerogenic drugs, and to warn them about the earliest signs of recurrent disease or of complications.

The family physician is in a position to detect areas of conflict in family dynamics and, through helping the family resolve these conflicts instead of just treating the patient with the ulcer, might decrease the likelihood of recurrence of the ulcer disease. Without adequate studies one can only speculate about the family physician's role in preventing recurrence, but it is an idea which should not be ignored.

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