Management of recurrent abdominal pain

In his preface to *The Child with Abdominal Pains* John Apley wrote: '... I started with a bias towards organic causes ... but the accumulating evidence gradually convinced me that in most cases an organic cause cannot be found'. In recent years, however, a number of reports have appeared in the medical literature that have suggested that careful investigation of children with recurrent abdominal pain may reveal previously unsuspected functional or morphologic abnormalities of the gastrointestinal tract. These have included reports of dysmotility, malabsorption, and mucosal inflammation.

**Recurrent abdominal pain – clinical studies**

Abdominal pain recurring over a period of at least three months, and sufficiently severe to interfere with normal activities, has been widely reported to affect at least 10% of children over the age of 5 years. Apley reported that an organic cause could be identified in fewer than 10% of such children. This relatively low frequency of detectable pathology had been noted previously, and subsequent reports have generally confirmed it. These studies have rightly encouraged a conservative approach to investigation. However, they may also have led to a degree of diagnostic nihilism. There is some evidence that children presenting with abdominal pain due to various organic disorders including peptic ulceration and Crohn's disease may be subject to an undue delay in diagnosis.

Whatever the conclusions to be drawn from the important studies by Apley, it must be emphasised that there is little evidence that the children he described were suffering from any single specific disorder. Indeed the clinical descriptions provided suggest that this was a heterogeneous group of patients. In two thirds of cases the pain was localised to the periumbilical region, but in many it radiated to other sites, and in some it was clearly localised to the epigastrum. The character of the pain also varied; the commonest description was of a dull ache, but colic was also frequent, while others described a burning sensation. The intensity of pain differed considerably between individuals, being mild in 50%, and severe in 25% of cases. Similarly the duration of pain ranged from minutes to days, and there was no consistency in terms of frequency or periodicity. Eight children were wakened from sleep by their pain – a feature now believed to suggest a diagnosis of peptic ulceration. Perhaps most significant were the associated phenomena, which included nausea, vomiting, diarrhoea, fever, headache, pallor, and sleepiness after attacks; these symptoms were all reported in a proportion of the children.

Despite this apparent clinical heterogeneity, Apley was ultimately drawn to the conclusion that in a large proportion of cases recurrent abdominal pain was a 'stress disorder'. He reported that compared with controls, children with recurrent abdominal pain showed characteristic personality traits – they were often considered anxious, timid, apprehensive, or 'highly strung'. Emotional disturbances were also said to be frequent; in this regard, nightmares, sleep walking, and nocturnal enuresis were considered to be abnormal emotional expressions. In coming to this conclusion Apley was aware that he was following in the footsteps of others. In this context it is interesting to note that at that time many physicians held the view that emotional disorders were at the root of inflammatory bowel disease. Subsequent studies have in general failed to provide convincing evidence that psychological disturbance is the predominant cause of recurrent abdominal pain in childhood.

It is not surprising, therefore, that speculation about the aetiology of recurrent abdominal pain has continued. In recent years a number of interesting studies have been described that purport to have identified significant organic abnormalities in these children.

**Gastro-oesophageal reflux**

A high incidence of gastro-oesophageal reflux has been reported in adults with dyspepsia not caused by an ulcer. Surprisingly, until recently no information was available with regard to the prevalence of reflux in children with recurrent abdominal pain. Van der Meer et al recently performed 24 hour intraoesophageal pH monitoring on 25 children with recurrent abdominal pain (age range 5–12 years), and demonstrated abnormal reflux in 14. Oesophageal biopsy specimens were unfortunately not obtained. In general symptomatology was not helpful in identifying those with reflux. Only two complained of regurgitation, and one was suffering from recurrent respiratory infections. Other symptoms such as retrosternal pain, vomiting, and water brash were absent. Implementation of antireflux measures, together with antacids was associated with prolonged clinical improvement in 10 cases. The treatment was however uncontrolled and unblinded, making interpretation of the results difficult.
Small bowel dysmotility
Adults with idiopathic chronic abdominal pain have been reported to experience excessive discomfort in response to gastric or intestinal distention.13 14 There is also evidence that some adults with unexplained abdominal pain and nausea or vomiting may have abnormal patterns of gastric and small bowel motility.15 Pineiro-Carrero et al recently studied gastroduodenal motility in children and adolescents with recurrent abdominal pain.16 Eight subjects aged 9 to 17 years, and seven controls aged 17 to 19 years, were investigated. Manometry was performed in the fasting state, and the migrating motility complex pattern was analysed. The patients with recurrent abdominal pain had more frequent migrating motility complexes, but these were of shorter duration and had slower propagation velocities than the control group.

The clinical symptoms in these patients were varied, suggesting that a single pathological entity was unlikely. Pain was located in the periumbilical region in four, in the left or right upper quadrant in three, and in both lower quadrants in one of these patients. Four complained of vomiting, one of nausea, four of constipation, one of diarrhoea, and two had no associated symptoms. Again this apparent clinical diversity makes interpretation of the findings difficult. Moreover, the patients' mean age was greater than that in most of clinical reports of childhood recurrent abdominal pain. Finally the age difference between patients and controls introduces some uncertainty about the significance of the differences in motility.

Gastritis
There is strong evidence that Helicobacter pylori is the aetiological agent in chronic antral gastritis, and perhaps also in peptic ulcer disease. Gastric colonisation with H pylori is found in almost all patients with otherwise unexplained chronic antral gastritis, and in many with peptic ulceration.17 18 Ingestion of H pylori has been shown to cause gastritis, and successful eradication of the organism predictably results in resolution of the inflammation. With regard to peptic ulceration the role of this organism is less clear, although there is evidence that its elimination reduces the frequency of ulcer recurrence.17

Despite widespread assumptions to the contrary, the clinical significance of chronic antral gastritis is uncertain. It has been shown that while H pylori colonisation is rare below the age of 5 years, it becomes gradually more frequent thereafter, and by 60 years of age more than 50% of individuals are affected.17 The high prevalence of H pylori associated gastritis in adult life certainly indicates that it is frequently if not always asymptomatic. Studies have not shown that the frequency of H pylori gastritis is increased in children with recurrent abdominal pain compared with asymptomatic controls, and there are no adequately controlled studies demonstrating resolution of pain with eradication of the organism.

Duodenitis
Van der Meer et al studied small bowel permeability in children with recurrent abdominal pain using 51Cr-EDTA.19 20 Intestinal absorption and hence urinary excretion of orally administered 51Cr-EDTA, is increased in a variety of gastrointestinal disorders where there is a loss of mucosal integrity, such as Crohn's disease and coeliac disease. The patients in this study appear quite similar to those described by Apley. 51Cr-EDTA excretion was significantly increased in 106 children with recurrent abdominal pain compared with paediatric controls. Endoscopy with duodenal biopsy was performed on 39 children, and duodenitis was reported in 28, although the histological changes were minimal in 15 cases. There was a significant association between the presence of duodenitis, and increased intestinal permeability as evidenced by enhanced 51Cr-EDTA excretion. It is disconcerting to note, however, that the increase in permeability was pronounced in those with minimal duodenitis, but was not significant in those with unequivocal inflammation.

The authors themselves pointed out that both subtle and obvious duodenitis may occur in asymptomatic adults. The findings in previous studies of duodenitis in children with recurrent abdominal pain have been inconsistent.21 22 These varying observations may reflect differences in histological interpretation, or they may again reflect clinical heterogeneity.

Carbohydrate malabsorption
In many individuals there is a decline in brush border lactase values with maturation, so that the prevalence of lactose malabsorption increases during childhood and adolescence. It has been suggested on the basis of breath hydrogen studies that lactose malabsorption may have a role in the aetiology of recurrent abdominal pain,23 but recent studies that have included more satisfactory controls have generally failed to confirm this proposition.24

Breath hydrogen analysis has also demonstrated incomplete absorption of the various monosaccharides present in certain fruit juices, and of the polyalcohol sugar sorbitol, which is present in certain 'sugar-free' food products. Any of these has the potential to cause intestinal cramping.25 26

Although some degree of carbohydrate malabsorption is very common, only a minority of subjects appear to be affected symptomatically. It may be that the occurrence of intestinal cramping is dependent on the individual's intrinsic response to gaseous bowel distension.25 It is certainly reasonable to consider the possible role of carbohydrate malabsorption in individual children with a history of intestinal cramping, particularly if there is also a history of loose stools. Simple dietary modification might prove beneficial in some such cases.

Conclusion
Apley did not claim to have resolved the enigma of recurrent abdominal pain in childhood. Rather, he set the problem in context, as a common complaint that in many cases ran a relatively benign course, and for which an organic cause was not often found. He did place a great deal of emphasis on the apparent role of psychological factors in the aetiology of the complaint. The inherent difficulties in proving such an hypothesis, together with the results of subsequent psychological studies, should at least raise some questions about this conclusion. There is little doubt that emotional factors are of great importance in some cases, but in evaluating the child it is of course necessary to consider that psychological disturbances and organic pathology may coexist.

The recent reports of organic abnormalities outlined above should certainly provide food for thought. Nevertheless, the aetiology of abdominal pain will likely remain obscure in many children for the foreseeable future. Naturally, rigid guidelines cannot be outlined for the management of recurrent abdominal pain, and as Apley suggested, the physician is dependant on clinical judgment in deciding the proper course of action. Recurrent abdominal pain does not represent a single entity, and so the approach adopted is based on a thorough clinical assessment of the individual patient. Pain that is unusual in terms of its localisation, character, frequency,
Management of recurrent abdominal pain

or severity should receive close attention. The presence of associated symptoms, or of relevant issues in the family history, or the physical findings may each prove helpful in determining which children require further evaluation, and in deciding the most appropriate direction for investigation.

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Commentary

Recurrent abdominal pain remains frustrating for both patient and doctor. This review draws attention to five organic disorders which can present with abdominal pain. At one time or another or from one author or another all of these have been suggested as possible causes for the periodic syndrome.

What is so interesting, and it can only be taken as a tribute to John Apley, is that despite greater understanding of these disorders the enigma remains. If physicians are to have guidance on how to manage individual patients with recurrent abdominal pain then it would be helpful if an unselected series of such patients were studied to discover what the incidence might be of the various conditions outlined by Murphy and whether treatment made any difference to the outcome. Only then would we know whether to go further than we currently do in investigating this mysterious complaint.

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Adoption, genetic disease, and DNA

Many paediatricians, both in hospital and in the community, have contact with children who are subject to the adoption process. For those who are medical advisers to adoption agencies their professional opinion is sought, usually in the assessment of a child before placement. The assessment includes family medical history, recognising the importance of genetic disease, although in many cases little or no information is available from the putative father. In most instances the gathering of information is heavily dependent on history taken by social workers, and on notes recorded by family doctors. If a genetic disease is highlighted during this process, before the placement, then appropriate investigations and counselling can be undertaken. If the disease emerges after the placement, however, there are no guidelines, either in law or practice, which address the issues of confidentiality that might arise.

A new dimension has been added to this area by the advances in molecular genetics that make it possible to track faulty genes through families by linkage or mutation analysis. It is now accepted that these advances challenge traditional principles of medical ethics concerning an individual’s right to confidentiality of information by virtue of the fact that we share our genes with relatives. Genetic information about an individual is potentially of direct interest to biological relatives, as highlighted by the Report of the Committee on the Ethics of Gene Therapy, section 4.15.1 Delicate issues of confidentiality may arise where the possible retrieval of information is prevented by placement of a child from a biological family into an unrelated family by adoption, or when there is a need to trace long separated biological relatives who are at risk of genetic disease. These ethical issues are unique to adoption in so far as there is special consideration given to rights and confidentiality for the child, as well as the adoptive, and birth, parents, and the break from the biological family has been given legal sanction. Yet clinicians may increasingly face