

Recurrent abdominal pain in childhood

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SUMMARY. One hundred and sixty-two children (57 boys and 105 girls), aged between three and 15 years and suffering from recurrent abdominal pain, were seen in general practice in Thamesmead during a seven-year period. Only five were found to have possible organic causes for the pain. Comparison with a control group showed that the close relatives of children with pain consulted doctors more often, had had more abdominal complaints and operations, a higher rate of psychiatric illness and referral, and more known marital problems. Relations between mothers and children with recurrent pain were often unstable and inconsistent. The clinical picture was unhelpful and investigation unproductive.

Recurrent abdominal pain in childhood is often a reflection of family disorder, and assessment of the state of the family should precede decisions on management.

Introduction

RECURRENT episodes of abdominal pain are common in childhood. Miller and colleagues (1974) reported that 18 per cent of the children studied in the 1,000 family survey in Newcastle upon Tyne had had recurrent pain. Other studies (Apley and Naish, 1958; Pringle *et al.*, 1964; Øster, 1972) all found a high rate, and in general it seems that at least one boy in 10 and one girl in seven are likely to suffer from it.

Suggested causes of recurrent pain are numerous. They include neurovegetative dystonia, tension fatigue syndrome, lactase deficiency, superior mesenteric artery syndrome, periodic syndrome, cyclical vomiting, mesenteric adenitis, abdominal migraine, and abdominal epilepsy.

Investigations in some published studies have been exhaustive. Stone and Barbero (1970) reported 102 cases; a total of 102 barium meals, 90 proctoscopies, and 40 intravenous pyelograms were performed on the children, whose stay in hospital averaged two weeks. The diagnosis ultimately made was irritable colon.

Apley (1975), in his classic study, investigated children referred to paediatric outpatients because of recurrent pain. His criteria for inclusion were children aged between three and 15 years who had had at least three attacks of pain, recurring during a period of not less than three months, and severe enough to restrict normal activities. Among 200 cases only 14 children were found to have organic lesions causing pain, seven each in the gastrointestinal and genitourinary tracts. Apley felt that pain usually resulted from anxiety. In most studies there is some mention of anxiety and family problems as factors in causing abdominal pain, but perhaps because most work has been done on children attending hospital little effort has been made to explore this further.

Aim

This review was devised to see how often children with recurrent abdominal pain were seen in one general practice, and whether information about the children and their families gained through contact with them was helpful in determining its cause.

Method

Medical records of all children attending the Lakeside Health Centre, Thamesmead, between 1 January 1971 and 31 December 1977 were reviewed. All those aged between three and 15 years and with recurrent abdominal pain satisfying Apley's criteria were accepted for the study. Each child was matched with a control of the same sex, using the practice age/sex register to obtain as a control the child whose date of birth followed his or hers most closely. Records of all other members of the children's and controls' families, if

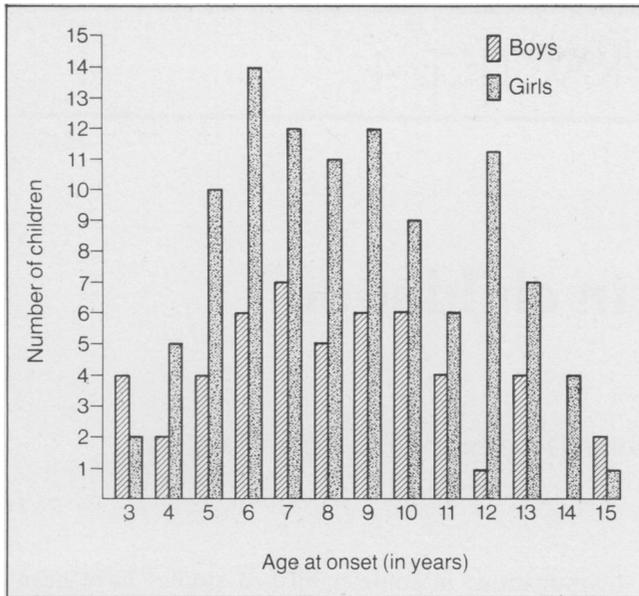


Figure 1. Age at onset of abdominal pain.

living at the same address and registered with the practice, were also reviewed.

The practice list grew from 2,000 at the beginning of 1970 to its present size of over 9,500, which was reached by the end of 1975. Throughout the seven-year period children under 15 years of age accounted for 36 to 38 per cent of the practice population.

The histories were reviewed to see whether features of recurrent pain were consistent. This could not be done in all cases, either because records were deficient or because accounts varied at different times. Hospital diagnoses of the 50 children referred were varied and often vague. Eleven intravenous pyelograms were performed on inpatients and one on a child not seen at hospital at all. Routine physical examination always included a urine culture, and this was often repeated.

In the summary of clinical features which follows, the number of cases in which reliable information is available is given in parenthesis.

Results

1. Age at onset (155).

In Apley's series the age at onset of pain reached a peak at five years; in boys the number then fell, but in girls there was a later and greater peak, half of them experiencing pain for the first time between eight and 10, and none starting after 10 years. The Thamesmead cases showed no such pattern (Figure 1).

It should be stressed that Apley's was a hospital series, and also that Thamesmead in its early years was relatively deficient in children aged over 10 years.

There were no significant differences in the clinical features at different ages of onset. As no variations between boys' and girls' experience of abdominal pain could be detected, figures for the sexes are combined in all tables.

Table 1. Site of pain.

Site of pain	Number
Epigastrium	9
Central, periumbilical	28
Central and right side	3
Central and left side	3
Right side	13
Left side	11
Lower abdomen	14
Variable, moves around	11
Unknown	70
Total	162

2. Length of history (155).

The shortest history was three months and the longest nine years. Eighty-seven children had attacks of pain for more than a year.

3. Duration of episodes (59).

These ranged from a few minutes to two or three days.

4. Frequency of episodes (47).

Most followed no regular pattern. Some children complained of pain on most days while others had attacks months apart.

5. Character of pain (77).

This was described as spasmodic and intermittent (63), brief and sharp or severe (10), or continuous (4).

6. Site of pain (92).

The site of pain is given in Table 1. This was usually constant for each child, though it varied in 11.

7. Other symptoms (116).

Up to five symptoms each were reported by 116 children as accompanying pain on some or all occasions (Table 2).

Table 2. Associated symptoms.

Symptom	Number
Vomiting	46
Headache	29
Pallor	21
Nausea	17
Anorexia	11
Diarrhoea	11
Pain on micturition	9
Limb pains	6
Frequency	6
Fever	5
Constipation	4
Chest pain	2

Children experienced up to five symptoms each.

Table 3. Hospital referrals.

Referrals	Number	Admissions
By former family doctors	6	3
By Lakeside doctors:		
surgical emergency	17	17*
to paediatric outpatients	16	6
to surgical outpatients	4	1
By parents, direct to casualty	7	4

*Two children were admitted twice and one three times.

Referrals

Fifty of the 162 children are known to have reached hospital at some time during the course of their illness. Six were referred by former doctors and 44 after the family had registered at Lakeside (Table 3).

Eleven appendicectomies were performed. Four children had undoubted acute appendicitis. One of them has not been seen again with pain in the three years since his operation, having had 18 months of recurrent pain previously; the other three, who all had long histories of pain, have continued to have attacks after operation, as have the seven who each had a normal appendix removed.

Organic causes of pain

Five girls were found to have recurrent urinary infections. Two had renal abnormalities treated surgically: the other three all had ureteric reflux. Only two of the five had complained of pain before the infection was discovered, yet despite appropriate and effective treatment of the infection pain recurred in both, and in one it continues still after seven years. The remaining three girls had no pain until after treatment of a urinary infection, when pain developed without evidence of reinfection. Siblings of two of them also had recurrent pain and are included in the series.

Associated conditions. Two girls and one boy were diagnosed as having migraine. The boy and one of the girls have since developed classical attacks in which headache and vomiting predominate.

Table 4. Sibling order.

Position in family	Survey	Controls
Only child	6	13
Eldest	64	62
Intermediate	52	46
Youngest	39	41
Living with grandparents	1	0

Table 5. Annual average contact rates. (Figures in brackets show the total number of individuals in each group.)

Family members	Survey	Controls
Patients	5.6 (162)	2.5 (162)
Fathers	4.1 (141)	2.9 (148)
Mothers	8.2 (147)	4.3 (155)
Siblings	3.9 (290)	2.3 (310)

The only other significant organic conditions were asthma in two children and epilepsy in one. There was a history of migraine in close relatives of 10 children.

Families and households

The 162 children with abdominal pain came from 149 families; in one family three children had pain and in 11 others two. The 162 controls came from 156 families, six of them contributing two each. Families in both groups comprised almost exclusively parents and from one to 10 children; only one survey and four control households included other adults as permanent residents. Two survey and three control families had only one parent at the time of registering with the practice, the father having left in all five. One child lived with her grandparents, having left her divorced mother because she disliked her mother's new partner.

Sixteen survey and nine control families were known to include children either born to the mother before marriage or the product of a previous marriage of either partner. One survey child was adopted.

Sibling order

This was similar in both groups (Table 4).

Contact rates

The mean annual contact rates of survey children and their parents and siblings, from registration with the practice until 31 December 1977, were compared with the rates of controls and their families. Only contacts between patients and doctors were counted, attendance at antenatal, family planning, or children's clinics being excluded.

All members of survey families consulted more often than did their opposite numbers in control families, survey mothers having a consultation rate nearly double that of the mothers of controls (Table 5).

Organic illness in families

Comparison of the histories of close relatives of survey children and controls showed an increased incidence among survey families of two organic conditions,

Table 6. Abdominal complaints.

Condition	Survey families	Control families
Peptic ulcer	10	10
Appendicectomy	43	28
Recurrent urinary infection	11	8
Termination of pregnancy	17	8
Sterilization (female)	23	14
Recurrent abdominal pain (adults: no diagnosis)	27	11
Miscellaneous	49	17
Total	180	96
Number of individuals	112	69
Number of families involved	94	63

p < 0.01

asthma and epilepsy, and a greater number of abdominal complaints (Table 6). The figures for asthma were 15 in survey and eight in control families; for epilepsy the figures were 10 and three.

The figures for abdominal operations in the two groups showed the same emphasis (Table 7).

Psychiatric illness in families

All patients in whom a formal psychiatric diagnosis was made after registration with the practice, or in whom there was a past history of psychiatric referral, were included (Table 8).

In 52 survey families both parents had had some psychiatric disturbance, compared with 26 control families. The diagnosis was usually anxiety or depression or both. Three parents of survey children and one of a control were schizophrenic and one mother of a survey child was subnormal. Heavy drinking was known in 20 parents of survey children and seven of controls.

Table 8. Psychiatric illness.

Family members	Survey families	Controls
Patients	24	11
Fathers	70	32
Mothers	126	79
Siblings	54	32
Total	274	154
Total families involved	145	101

p < 0.001

Table 7. Abdominal operations. (Figures in brackets show the total number of abdominal operations performed.)

Group	Fathers	Mothers	Siblings	Total
Survey families	23 (28)	62 (91)	7 (8)	92 (127)
Controls	12 (13)	29 (39)	8 (9)	49 (61)

p < 0.001

Only four families including children with recurrent abdominal pain were free from known psychiatric disorder. In one of these families the mother was not registered with the practice; in one a boy had his first pain shortly after his father had an abdominal operation; the other two families were apparently stable and happy. Fifty-five control families had no psychiatric problems.

As the higher incidence of recorded psychiatric illness in survey families might represent a wider knowledge of their problems gained from their more frequent attendances, the number of referrals to psychiatrists of members of survey and control families was compared, since this gives a more reliable indication of the severity of the disorder (Table 9).

Psychiatric referrals involved nearly one third of survey families. In six both husband and wife had been referred.

The state of the marriage

An attempt was made to assess the state of the marriage of parents in both groups. In a number of instances this could not be done; in five survey and four control families one or both parents were not registered with the practice. Twenty-four parents of children in the survey were known to have had previous marriages, 20 subsequently divorcing and four being bereaved. Nineteen parents of controls had had previous divorces and two had been widowed.

Marital disharmony was known in a number of

Table 9. Psychiatric referrals.

Referrals	Survey families	Controls
Patients	5	1
Fathers	14	6
Mothers	28	13
Siblings	9	4
Total	56	24
Total families involved	45	23

p < 0.001

Table 10. Marital problems.

Family problem	Survey families	Controls
Marital disharmony	51	22
One-parent families	2	3
With grandparents	1	0
Total	54	25

$p < 0.001$

families, and in all, 33 per cent of survey families were known to be in some disarray, compared with 15 per cent of control families (Table 10).

Since registration with the practice nine marriages of the parents of survey children and five of the parents of controls have broken down, apparently permanently. One father of two survey children and one of a control have died.

Unreported cases

Parents from 75 families, which included a total of 198 children, attending the surgery for consultation, were asked whether any of their children had suffered from recurrent pain. Replies indicated that 14 children from 13 families had probably had pain satisfying Apley's criteria, although medical advice had never been sought. There was known psychiatric disturbance in members of all 13 families, while among the 62 families without complaint of pain in the children 19 had never had evident psychiatric problems. It seems, therefore, that recurrent pain may often go unreported and that the figures quoted from this practice are an underestimate of the prevalence of the condition in Thamesmead. Retrospective review of medical records also revealed at least six cases where the history was suggestive but lacking in sufficient detail to warrant inclusion.

Discussion

Reviewing the cases of recurrent pain revealed the absence of consistent features in the history or on examination. The account given by child or mother might have varied from time to time; description of the length of history, of the site and duration of pain, and of any symptoms associated with the pain, might all have changed at different interviews. Apley found that the probability of an organic cause was increased with the distance from the umbilicus at which the pain was felt. This was not the case in this series.

Comparison with control families showed some important contrasts. An increase in consultation rates with doctors affected all members of survey children's families; experience of abdominal pain and operations was also much greater, especially among mothers. The higher rate of psychiatric symptoms and referrals

suggests a greater degree of anxiety. Known marital difficulties affected more than twice as many of the survey children's families compared with controls. However, since the distribution of family size, ages of parents and siblings and the records of the survey families were more detailed than those of the controls, care should be taken in interpreting the results.

Information about marital problems and an assessment of their seriousness depended upon evidence provided not only by the couple themselves, but also by neighbours, health visitors, social workers, or probation officers.

The larger numbers of survey families known to be in trouble may have been due to parents being more ready to resort to doctors than the control parents, this being apparent already from their respective consultation rates. This may have led to problems being reported which control parents would have managed without help. Alternatively, the greater vulnerability of parents of children in the survey to stress may create more genuine unhappiness through their inability to deal with everyday problems of family life.

There is similar uncertainty over the significance of the high incidence of abdominal complaints in the survey families. This could have resulted from a low threshold of tolerance of symptoms, leading to early and frequent consultation and a greater number of doctor diagnoses; or increased experience of abdominal pain may have resulted in greater parental concern over similar symptoms in their children; or there may have been a family pattern of recurrent pain in successive generations.

The inference which can be drawn from these findings is that stress within the family may be important in the aetiology of recurrent abdominal pain in children. Often both mother and child blamed difficulties at school as contributing to the general unhappiness, yet where there seemed to be substance to their complaint enquiry at the school produced little evidence of any real problem. At further interviews the emphasis on school as the source of the trouble faded and it appeared less important than the domestic environment.

In some cases there was evidence of emotional strife between mother and child. Children with pain were described as impossible, difficult, jealous, or rude, yet at other times the same children were excessively clinging and affectionate. The most commonly expressed view was that they were different from the other children in the family, and were regarded by mothers with mingled bafflement, irritation, and guilt. The reactions of the children varied, but a number of them showed how deeply affected they were by family troubles. Fear of their mother's ill health (usually depression), of the death of a parent, or of their father and mother divorcing, were voiced. Some children had intervened physically between their parents during a quarrel; others had retired miserably out of earshot.

Recurrent abdominal pain is worrying to parents and

doctor alike. Diagnostic doubt, the fear of missing organic illness, and pressure from anxious parents may lead either to emergency hospital admission or to referral to outpatients. Pursuit of an organic cause for symptoms is unrewarding and expensive; investigation may be traumatic and in this series it was not encouraging. Only five urinary infections were discovered, and their relation to the pain was in all five cases questionable.

The natural history of the condition was described by Apley (1975), who reported 30 patients presenting in childhood with abdominal pain and seen again between eight and 20 years later. By that time nine had no symptoms; in nine the pain had ceased but other symptoms, chiefly migraine, recurrent headaches, or nervous disorders, had appeared; and 12 continued to have abdominal pain, almost all of them with additional symptoms. In Apley's words, "Little bellyachers grow into big bellyachers". The adult patient with longstanding abdominal symptoms and medical records bulging with letters and reports is familiar in hospital and in general practice. Gomez and Dally (1977), in a review of 96 adults attending medical or surgical clinics because of recurrent or persistent abdominal pain, found that only 15 had organic disease; 69 were suffering from tension, depression, or hysteria, and one third of them had a history of abdominal pain in childhood.

One girl in this series presented with pain at the age of 12. An emergency admission and removal of a normal appendix was followed by more pain and she was seen subsequently by another surgeon, a paediatrician, a gynaecologist, a general physician, and a psychiatrist. At the age of 18 she is still having pain. Two other children have been having pain for nine years.

If the evidence of underlying family disorder as a cause of recurrent abdominal pain is acceptable, it seems rational to spend time exploring the social background and family life of children before embarking on investigation of possible physical causes. Discussion of the best way to help the family as a whole may lead to a decision that the problem might be handled more appropriately by a health visitor or a social worker. The effort is worth making; much later suffering and hardship might be averted if the problem could be identified and dealt with effectively when it first presents, in childhood.

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Vitamin C and acute illness in Navajo schoolchildren

To evaluate earlier observations, including our own, showing usefulness of vitamin C for managing the common cold, we performed a double-blind trial of vitamin C versus placebo in 868 children. There was no difference in number becoming ill (133 versus 129), number of episodes (166 versus 159) or mean illness duration (5.5 versus 5.8 days) between the groups. Children receiving vitamin C had fewer throat cultures yielding β -haemolytic streptococcus (six versus 13, $p < 0.10$), but no difference in overall complicated illness rate (24 versus 25). Plasma ascorbic acid levels were higher in the vitamin group 24 to 26 hours after supplementation (1.28 versus 1.04 mg per 100 ml, $p < 0.01$). Children with high plasma ascorbic acid concentrations had longer mean illness (6.8 versus 4.0 days, $p < 0.05$) than those with low levels. Vitamin C does not seem to be an effective prophylactic or therapeutic agent for upper respiratory illness.

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Status of the family practitioner

The independent contractor status of the family doctor is as essential to the freedom of the patient from the State as it is to the freedom of the doctor. Any proposal to depart from it into a State salaried service should be viewed with alarm and resisted by both parties.

There is already much criticism of the role of the family practitioner committees in controlling the number of family doctors in a district and the right of partnerships to choose a partner. There are also problems over the control of prescribing and delays in payment for services provided. A greater rather than a lesser degree of independence would seem in the best interests of good family practice.

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