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Original Article

Natural history of irritable bowel syndrome

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Abstract ***Background***: Chronic diarrhea and functional abdominal pain (FAP) in childhood could be an early manifestation of adult irritable bowel syndrome (IBS). The aim of this study was to investigate the presence of chronic functional digestive symptoms in childhood, interviewing adult patients diagnosed with IBS, in an attempt to establish a relationship between them.

Methods: By means of a questionnaire, the history of colic, chronic diarrhea, functional abdominal pain, constipation and migraine in childhood, was analyzed in patients diagnosed with IBS according to the current Rome III criteria, and in control patients without known chronic digestive disorders. Fisher's exact test was used for comparison of frequencies.

Results: The IBS study group was made up of 40 patients (24 women; average age, 33.03 years), and the control group by 40 adults (22 women; average age, 29.62 years). IBS-diagnosed adults spoke about a significantly higher prevalence of chronic diarrhea (32.5/7.5%; odds ratio [OR], 7.01; 95% confidence interval [CI]: 26.84–1.80), and FAP (37.5/15%; OR, 4.30; 95%CI: 12.67–1.43) in their childhood, than the control group. There were no differences in the presence of other childhood functional symptoms. Interestingly, the present patients, when asked about the onset of symptoms that led to the diagnosis of IBS, referred to them mostly beginning in adulthood, not linking their current diagnosis of IBS with their background in childhood.

Conclusions: In a proportion of adults with IBS the natural history of their symptoms probably began during their childhood.

Key words children, functional abdominal pain, irritable bowel syndrome.

According to the diagnostic criteria defined by the recent Rome III Committee recommendations, irritable bowel syndrome (IBS) is a functional bowel disorder, in which there is a change in bowel habit or abdominal pain associated with defecation, with symptom onset at least 6 months prior to diagnosis.[1] IBS is the most common gastrointestinal diagnosis in adults experienced by 10–15% of the general population, with a predominance in women.[2–4]

The pathogenesis of adult IBS remains uncertain. Studies of twins generally support a genetic component in IBS, but social environment has an equal or greater contribution. The concordance for IBS between monozygotic twins was significantly greater than that between dizygotic twins, but the concordance between mothers and their respective children was greater than that between monozygotic twins.[5] A large number of mothers of children with functional gastrointestinal disorders (FGID) have the same FGID as their children.[6] In addition, epidemiological studies have implicated psychosocial factors, such as life and psychological stresses; and various early childhood adverse life events also may carry an increased risk of IBS as an adult.[6–8]

Abdominal pain-related FGID, including recurrent functional abdominal pain (FAP) and IBS, are also observed in childhood, and the updated Roma III criteria for children aged 4–18 years have recently been published.[9] In clinical practice, the proportion of patients diagnosed with IBS is still very low in the pediatric age group, but recurrent FAP is often diagnosed. Many children and adolescents with FAP, however, will also meet criteria for IBS or other FGID.[10]

FAP is the most common recurrent pain in childhood, and approximately 10% of children experience FAP at any one time.[2] The long-term outcome of this condition has not been determined,[11] although these children are more likely than their peers (without this symptom) to have lifelong psychiatric disorders as well as other painful somatic symptoms such as migraine headache.[12–14]

Population-based studies have demonstrated that these children with FAP will report abdominal pain or symptoms of IBS 5–30 years later,[10,15–24] in approximately one-third to one-half of affected children; a significantly higher proportion than that in adults who did not have FAP in childhood. There is an increased risk of IBS if there is recurrent abdominal pain during childhood

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(adjusted OR, 2.01).[25] A systematic review for prospective cohort studies published from 1960 until 2005 included >1000 children who had experienced pain during childhood and were followed up for 5 years (range 1–29 years). In total, 29.1% of these patients had abdominal pain after follow up.[26]

In contrast, there are only some retrospective studies of adults with IBS who recalled experiencing abdominal pain in childhood, also suggesting that at least a subset of adult IBS may represent the persistence of symptoms from childhood.[15,24] For all these reasons, and because of the similar characteristics of the two conditions, chronic FAP in childhood could be an early manifestation or precursor of adult IBS.[24]

Methods

We carried out a study by means of a questionnaire, to investigate the presence of chronic functional digestive symptoms in childhood, interviewing adult patients diagnosed with IBS, in an attempt to establish a relationship between them.

This study analyzed the history of early colic, chronic diarrhea, FAP, constipation and migraine in childhood, in patients >18 years of age, controlled at consultations of gastroenterology, and diagnosed with IBS according to the current Rome III criteria. All of them had normal colonoscopy and celiac serology, and lacked signs of alarm. None of the patients declined their participation.

We also enrolled adults without known chronic digestive disorders who consecutively attended a primary care center, and carried out the same procedure. All the participants were under the age of 45, to minimize the memory factor.

Having created a structured questionnaire, the doctors questioned the patients about all the pathologies under analysis, having previously explained and clarified to the patients any possible doubts about them.

We used the Fisher exact test for comparison of frequencies. We analyzed responses regarding the existence or not of the symptoms, after excluding those patients who could not recall the data asked for. This research was approved by the Ethics Committee of University Clinic Hospital, Valladolid, Spain, and conformed to the provisions of the Declaration of Helsinki, and verbal informed consent was requested in all cases.

Results

The IBS study group was made up of 40 patients: 16 men and 24 women (average age, 33.03 ± 7.45 years; range, 19–45 years), and the control group by 40 adults: 18 men and 22 women (average age, 29.62 ± 8.17 years; range, 17–44 years). There were no statistically significant differences in age, sex, or prevalence of breastfeeding between the IBS and control group (72.5% vs 85%, respectively).

The clinical characteristics are given in Table 1. The onset of IBS symptoms and diagnosis occurred at an average age of 21.9 years (range, 7–43 years) and 26.6 years (range, 11–45 years) respectively. The predominant symptoms were: intermittent chronic diarrhea (72.5%), abdominal pain (60%), bloating (60%), sensation of incomplete evacuation (50%) and constipation (25%). Seven of these patients presented diarrhea alternating with constipation (17.5%), and 60% recognized that the problem alters their quality of life and leads them to seek medical advice frequently for this reason.

Table 1 Clinical IBS patient characteristics ($n = 40$)

	Yes		No	
	n	%	*n*	%
Intermittent chronic diarrhea	29	72.5	11	27.5
Constipation	10	25.0	30	75.0
Diarrhea and constipation	7	17.5	33	82.5
Recurrent abdominal pain	24	60	16	40
Bloating	24	60	16	40
Sensation of incomplete evacuation	20	50	20	50
Seek medical advice frequently	24	60	16	40
This problem alters their quality of life	24	60	16	40
Often fail to work or study	4	10	36	90
Migraine headache	3	7.5	37	92.5

IBS, irritable bowel syndrome.

With regard to the presence of chronic functional digestive symptoms and migraine in childhood, the main results are listed in Table 2. IBS-diagnosed adults spoke about a significantly higher prevalence of chronic diarrhea (32.5% vs 7.5%, odds ratio [OR], 7.01; 95% confidence interval [CI]: 26.84–1.80; $P < 0.01$), and recurrent abdominal pain (37.5% vs 15%; OR, 4.30; 95%CI: 12.67–1.43; $P < 0.01$) in their childhood, than the adults in the control group. There were no differences in the presence of constipation (OR, 1.30; 95%CI: 3.38–0.71), or migraine headache (OR, 1.26; 95%CI: 3.97–0.39) in children between the two groups. In the case of early infant colic, the data were not assessable due to the large number of patients who did not remember this aspect.

The higher prevalence of "don't know" answers to all the questions in the IBS group compared to those of the control group is striking. There were statistically significant differences in the case of early colic ($P < 0.001$), constipation ($P < 0.05$) and migraine ($P < 0.01$).

Discussion

Irritable bowel syndrome is a frequent problem that has major implications for patient wellbeing and health-care system load, and it occurs in all age groups but there appears to be a modest decline in prevalence as age advances. IBS can be diagnosed also in children, based on the Roma III criteria, and few tests are required for patients who have typical IBS symptoms and no alarm features. All the present patients, however, had normal colonoscopy, among other medical tests, and lacked signs of alarm. In the present series, predominance of female sex was observed, as traditionally described.

Irritable bowel syndrome may present various symptoms that could change depending on age. The long-term maintenance of abdominal pain reported in surveys of children with FAP suggest that FAP may be a childhood precursor of IBS.[2] A family history of IBS is the major determinant of persistent abdominal complaints in adults with a history of pediatric FAP.[27]

It is true, however, that many of the studies are old and may be biased due to the lack of standardized assessments and uniform

Table 2 Functional symptoms in childhood

	IBS ($n = 40$)		Control ($n = 40$)		P
	n	%	n	%	
Early colic	Yes: 6	15.0	Yes: 10	25.0	
	No: 6	15.0	No: 22	55.0	
	Don't know: 28	70.0	Don't know: 8	20.0	
Chronic diarrhea	Yes: 13	32.5	Yes: 3	7.5	<0.01
	No: 21	52.5	No: 34	85.0	
	Don't know: 6	15.0	Don't know: 3	7.5	
Recurrent abdominal pain	Yes: 15	37.5	Yes: 6	15.0	<0.01
	No: 18	45.0	No: 31	77.5	
	Don't know: 7	17.5	Don't know: 3	7.5	
Constipation	Yes: 13	32.5	Yes: 13	32.5	0.594
	No: 20	50.0	No: 26	65.0	
	Don't know: 7	17.5	Don't know: 1	2.5	
Migraine	Yes: 7	17.5	Yes: 7	20.0	0.898
	No: 26	65.0	No: 33	80.0	
	Don't know: 7	17.5	Don't know: 0	0.0	

IBS, irritable bowel syndrome.

diagnostic criteria, and the direct link between childhood and adult complaints remains to be established. Although prospective and systematic longitudinal studies of a larger birth cohort that would follow individuals from childhood to adulthood, using validated definitions of FGID, are required to establish a relationship, these studies can provide information only after a long period of observation.[4,15]

Furthermore, there are fewer retrospective studies of patients with IBS, such as the present one, which, although logically would also involve recall bias and weakness, provide information more quickly. We must also take into account that the experience of pain symptoms may positively influence selective recollections of past memories of pain during childhood.[15]

Attention may be drawn to the strikingly higher percentage of IBS patients who claim that they do not remember the existence of symptoms in childhood compared to those patients in the control group. In theory, however, IBS patients should feel more committed to the present study because they are chronic sufferers of the illness. It is likely that the control group patients, who do not usually suffer from painful upsets, are more able to identify these previous pathological disorders, and the "don't know" answer could, in fact, be expected or could foretell the development of IBS to a greater extent.

The present study provides evidence that the recollection of FAP and chronic diarrhea during childhood is specifically associated with adults reporting symptoms of IBS. Interestingly, the present patients, when asked about the onset of symptoms that led to the diagnosis of IBS, referred to them mostly beginning in adulthood, not linking, in general, their current diagnosis of IBS with their background in childhood.

Lowman *et al*., also in a semi-structured interview of adults with IBS, reported poorer general health and higher prevalence of headache, stomach ache, and bowel complaints during childhood.[24] It has been suggested that environmental influences in early life are important factors in the pathogenesis of FGID,[28] and that these patients may later have a chronic visceral hypersensitivity, either particular sensitivity to life stress or an early social reinforcement of illness behavior.[15]

Despite the limitations of this type of study, the present findings support the hypothesis that in a proportion of adults with IBS probably the natural history of their symptoms began during their childhood, and recurrent pediatric FAP or functional chronic diarrhea can predict later IBS development.[15,17,27] FAP or functional chronic diarrhea in childhood, and adult IBS, could be different stages of the same disease, with a developmental continuum between them,[2,13,18,29] or at least the two are pathogenically linked.[30] The recognition of this relationship may allow early intervention to reduce the subsequent impact of the disorder.[4,31,32] Furthermore, using the current criteria, it should be possible to make a diagnosis of IBS more frequently than is currently occurring.

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