

Psychosocial risk factors for the onset of abdominal pain. Results from a large prospective population-based study

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Objective	To determine the psychosocial risk factors for the development of abdominal pain and to determine whether, in those people who consulted, symptoms had been attributed to an organic cause.
Design	Prospective population-based postal survey with follow-up survey at 12 months.
Setting	A mixed sociodemographic suburban area of Manchester, UK.
Participants	Subjects aged 18–65 years were randomly selected from a population-based primary care register who had responded to a detailed pain questionnaire, which included a pain manikin drawing. They also completed the following psychosocial instruments: General Health Questionnaire, Somatic Symptom Checklist, Fatigue Questionnaire and the Illness Attitude Scales (including the 'health anxiety' and 'illness behaviour' sub-scales).
Main outcome measures	The onset of new abdominal pain.
Results	Of the 1953 participants at baseline, 1763 were free of abdominal pain: 1551 were followed up at 12 months (adjusted follow-up rate of 92%) of which 69 subjects reported new abdominal pain (new onset rate 4.6%). New abdominal pain was similar in females (4.9%) and males (4.2%), and did not vary by age group. Baseline factors which predicted onset were high levels of fatigue (odds ratio [OR] = 3.3, 95% CI: 1.9–5.8), psychological distress (OR = 3.4, 95% CI: 1.9–6.0), high scores on the illness behaviour scale (OR = 3.3, 95% CI: 1.7–6.7) and high levels of health anxiety (OR = 2.1, 95% CI: 1.1–3.9). Reporting low back pain at baseline was also associated with an increased risk of reporting abdominal pain (OR = 2.0, 95% CI: 1.2–3.3). On multivariate analysis, high levels of psychological distress and aspects of prior illness behaviour were the major independent predictors of outcome. Of those who sought health care, only one consultation led to a definite diagnosis.
Conclusion	In subjects free of abdominal pain, psychological distress, fatigue, health anxiety and illness behaviour are predictors of future onset rather than merely a consequence of symptoms. These results suggest that abdominal pain shares some common features of onset with pain at other sites thought not to be primarily organic in origin.
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Chronic, medically unexplained symptoms have a high prevalence in the adult population of most countries of Western Europe and the US.¹ Those relating to the gastrointestinal (GI) tract are particularly common. In the UK, 25% of the population at any time report symptoms of abdominal pain or altered bowel habit^{2,3} and over 30% report dyspepsia.^{4,5} In the great

majority, no structural disorder is ever identified and it is assumed that these symptoms are due to disordered GI function. The term Functional Gastrointestinal Disorder (FGID) has been developed to include these symptoms. It is usually subdivided according to symptom clusters, although there is considerable overlap between these groups.⁶

Functional gastrointestinal disorders are a common reason for presentation in primary care.^{2,5} It has been estimated that 50% of all consultations in primary care for GI problems are identifiable as FGID.⁷ Cross-sectional studies have shown that increased anxiety, depression, and worries about illness are associated with consulting a doctor with FGID.⁸ However, despite strong theoretical grounds for believing that a combination of psychosocial and biomedical factors are involved in their occurrence and prolongation, relatively little is known about their aetiology or pathophysiology.

Abdominal pain is the commonest presenting symptom for patients with FGID. The influence of psychosocial factors has not been extensively studied with respect to the onset of abdominal pain. Psychosocial factors do have a strong influence on onset⁹ and chronicity¹⁰ of pain at other sites which are thought not to be primarily organic in origin such as low back pain and chronic widespread pain. Whether psychological and social factors in population-based subjects with abdominal pain are a consequence of pain symptoms or are associated with pain onset remains to be elucidated. The only way to disentangle this relationship is to conduct a population-based prospective study.

The aim of the current study was therefore, in an unselected population sample, to prospectively examine whether psychosocial factors predict future onset of abdominal pain. Our secondary aim was to investigate whether, for those reporting a new episode of abdominal pain, subjects had consulted their general practitioner (GP) and, if so, whether any diagnosis had been made.

Methods

Design

The study was a population-based prospective postal survey. At baseline, subjects with and without abdominal pain were identified. Levels of psychological distress and other indicators of somatization were measured. Twelve months after the baseline survey, subjects who were initially free of abdominal pain were re-surveyed and new cases of abdominal pain were ascertained.

Study subjects

Subjects aged 18–65 years were selected from a population-based primary care register, covering a mixed sociodemographic suburban area of Manchester. In all, 1953 subjects who responded to the baseline questionnaire comprised the study population.¹¹

Questionnaire

At baseline each subject was sent a questionnaire by post that enquired whether, during the previous month, they had experienced any pain that had persisted for ≥ 24 hours. Four drawings of the body were included (front, back and sides) on which subjects were asked to indicate the site(s) of pain. This information was coded using a template. These methods have been used previously to determine the location and duration of pain.^{11,12}

Those subjects who had shaded within the abdominal area on the body manikin were considered to have abdominal pain (Figure 1). In addition to pain, data on other physical and psychological features of the process of somatization were obtained.

Features of somatization

The baseline pain questionnaire included sections to assess aspects of physical complaints, illness attitudes and behaviours, and levels of psychological distress which have been associated with the process of somatization. These were:

*The Somatic Symptom Checklist*¹³

This was originally validated as a screening test for somatization disorder. The scale includes six items: trouble breathing, frequent vomiting (when not pregnant), loss of voice for >30 minutes, being unable to remember what you have been doing for hours or days (without the influence of alcohol or drugs), difficulty swallowing, and frequent pain in the fingers or toes, and an additional item for females: frequent trouble with menstrual cramps. These symptoms are included in the American Psychiatric Association's criteria for somatization disorder.¹⁴ In the original validation study a threshold of between 3 and 4 resulted in a sensitivity of 73% and specificity of 94% for identifying cases of somatization disorder. To avoid spurious associations with new cases of abdominal pain only those 'non-pain' somatic symptoms were examined (i.e. frequent trouble with menstrual cramps and frequent pain in the fingers and toes were excluded). The total score was therefore between 0 and 5 for both males and females.

*The Illness Attitude Scales (IAS)*¹⁵

These nine scales assess attitudes and concerns about illness and health. Each scale includes three items, each scored from 0 to 4, providing a total score between 0 and 12. Individual scales assess worry about health, concern about pain, health habits,

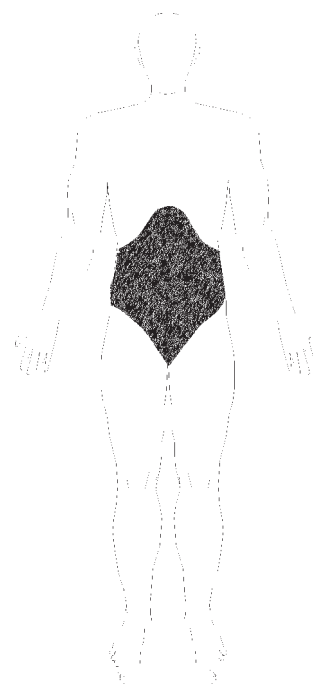


Figure 1 Anatomical area used to define abdominal pain

hypochondriacal beliefs, thanatophobia (fear of death), disease phobia, bodily preoccupation, treatment experience and effect of symptoms. A recent study¹⁶ based on a principal components analysis demonstrated that the IAS measures two dimensions reflecting 'health anxiety' and 'illness behaviour'. The 'health anxiety' sub-scale consists of 11 items (such as 'Are you worried that you may get a serious illness in the future?') and has a total score between 0 and 44 with a general population mean score of 9.1 (s.d. 6.9). The 'illness behaviour' sub-scale consists of six items (such as 'How often do you see a doctor?') and has a total score between 0 and 24 with a general population mean score of 4.7 (s.d. 4.2).

General Health Questionnaire

The 12-item version of the General Health Questionnaire¹⁷ (GHQ) was included as a measure of psychological distress. Each item has four possible responses but for scoring these were dichotomized at the midpoint. Scores for individual items are summed to give a total score ranging between 0 and 12 with high scores indicating higher levels of psychological distress.

Fatigue Questionnaire¹⁸

This is an 11-item instrument developed for use in population studies to measure physical and mental aspects of fatigue, a feature commonly observed in many somatizing patients. Each item has four response options. In a similar manner to the GHQ, scores for individual items were dichotomized at the midpoint and these individual scores are summed to provide a total score between 0 and 11, with high scores corresponding to high levels of fatigue.

Follow-up

Subjects free of abdominal pain at baseline were eligible for follow-up and were mailed an identical questionnaire after 12 months. The same methods for recording and categorizing pain were used as those for the baseline survey. The observer categorizing pain status was blind to the information included in the baseline questionnaire. Subjects reporting a new episode of abdominal pain were identified.

General Practice record check

We were interested in examining whether those subjects who had reported new abdominal pain at follow-up had consulted a GP with symptoms and, if so, whether a diagnosis had been made. Two of the authors (SLSH and JM) conducted a review of medical records for subjects who reported new abdominal pain. All assessments were made blind to all psychosocial measures included in the questionnaire.

Statistical analysis

Those subjects who provided complete data at baseline and follow-up were included in the analysis. The distribution of the baseline psychosocial scale scores was not Gaussian. Thus subjects scoring zero on the GHQ and Fatigue scales were classified as one group (the referent group) with the remaining subjects dichotomized at the midpoint. For the IAS sub-scales, subjects' scores were divided by thirds. The association between new abdominal pain and the scale scores of those subjects scoring in the middle and highest thirds were compared to those in the lowest third. Since no significant heterogeneity was evident (Mantel-Haenszel tests for heterogeneity¹⁹ $P > 0.05$) the results

are presented as summary odds ratios (OR) with 95% CI which, under the rare disease assumption, provide a valid estimate of the relative risk. Those risk factors associated with abdominal pain were entered into a multiple logistic regression model to examine the relative contribution of those to the presence of new abdominal pain. All analyses were conducted using the STATA statistical software.²⁰

Results

After excluding those subjects for whom pain status was not available (n = 43), 147 (7.7%) subjects reported abdominal pain at baseline with a higher prevalence rate in women when compared to men (9.3% versus 5.6%, χ^2 test for difference $P = 0.003$). A total of 1763 subjects were identified, free of abdominal pain. At 12-month follow-up, 1551 subjects (667 males, 884 females) returned the questionnaire. After adjustment for those subjects who had moved to another address or died and therefore did not receive a questionnaire (n = 82), the response rate was 92%. Complete baseline and follow-up data was available for 1501 (97%) of these subjects.

As shown in Table 1, 69 subjects reported new onset abdominal pain (new onset prevalent rate = 4.6%) at follow-up with similar proportions in men and women (4.9% versus 4.2%, χ^2 test for difference $P = 0.47$) and with little effect on prevalence of age (χ^2 test for difference $P = 0.75$) (Table 2).

Predictors of new onset abdominal pain

Table 3 shows the age- and gender-adjusted univariate associations of the baseline measurements with the presence of new onset abdominal pain. Those subjects with the highest levels of psychological distress were more than three times as likely to have new onset abdominal pain symptoms when compared to those with the lowest levels of distress. Subjects scoring in the highest range of the Fatigue Questionnaire were again over three times as likely to have new onset abdominal pain symptoms. Similar associations were observed for those scoring in the top third of the Illness Behaviour Scale, whereas high Health Anxiety scores were associated with a 2.1 times increase. Of the

Table 1 Prevalence of new abdominal pain at follow-up by gender

	Gender		
	Male	Female	All subjects
No. in group	650	851	1501
No. with new abdominal pain	27	42	69
Prevalence (%)	4.2	4.9	4.6
(95% CI)	(2.9–5.9)	(3.6–6.6)	(3.6–5.8)

Table 2 Prevalence of new abdominal pain at follow-up by age

	Age			
	18–37	38–49	50–65	All subjects
No. in group	531	482	488	1501
No. with new abdominal pain	23	25	21	69
Prevalence (%)	4.3	5.2	4.3	4.6
(95% CI)	(2.8–6.4)	(3.4–7.6)	(2.7–6.5)	(3.6–5.8)

Table 3 Predictors of new abdominal pain at follow-up. *Univariate model*

Exposure	Scale range	N ^a	n with new abdominal pain	OR ^b	95% CI
Psychosocial scales					
'Illness Behaviour'					
	0-3	461	11	1	-
	4-7	560	22	1.7	0.8-3.5
	8-21	480	36	3.3	1.7-6.7
Somatic symptoms					
	0	887	30	1	-
	1	385	25	1.9	1.1-3.2
	2-5	188	14	2.1	1.1-4.1
General Health Questionnaire					
	0	799	21	1	-
	1-2	312	15	1.9	1.0-3.8
	3-12	390	33	3.4	1.9-6.0
Fatigue					
	0	905	27	1	-
	1-3	307	15	1.7	0.9-3.2
	4-11	289	27	3.3	1.9-5.8
'Health Anxiety'					
	0-9	542	15	1	-
	10-14	431	24	2.0	1.1-4.0
	15-44	528	30	2.1	1.1-3.9
Other regional pain syndromes					
Low back		398	27	2.0	1.2-3.3
Shoulder		380	19	1.2	0.7-2.1
Knee		310	16	1.3	0.7-2.3

^a Total group size.

^b Odds ratio of having new abdominal pain by scale score, age- and gender-adjusted.

other musculoskeletal regional pain syndromes (low back pain, shoulder and knee pain) measured at baseline, low back pain was the only symptom associated with an increased risk of new abdominal pain at one-year follow-up.

Multivariate analysis (Table 4) indicated that high levels of distress and high Illness Behaviour scores were significant independent predictors of onset. Of those subjects exposed to none of these factors at baseline only 2.8% reported new abdominal pain at follow-up, rising to 4.9% in those exposed to one and 11.4% in those exposed to both.

Table 4 Combined regression model of risk factors for new onset of abdominal pain. Adjusted for age and gender

Exposure	Odds ratio	95% CI
Illness Behaviour		
0-3	1	-
4-7	1.5	0.7-3.2
8-21	2.4	1.2-5.1
General Health Questionnaire		
0	1	-
1-2	1.6	0.8-3.3
3-12	2.7	1.5-4.9

General Practice record review

Of the 69 subjects who reported new abdominal pain at follow-up, medical record information was available for 59 (86%: 36 female, 23 male). Of those, 8 (14%) people had consulted with GI symptoms. Women (n = 6, 17%) were more likely to consult with symptoms than men (n = 2, 9%). A definitive diagnosis of traveller's diarrhoea was made during one consultation. The remaining seven consultations were for four cases of diarrhoea and three cases of non-specific abdominal pain.

Methodological issues

Although the follow-up rate was very high, we wished to examine the potential for non-participation bias. We therefore compared the baseline characteristics of those 1551 subjects who participated with the 130 who were lost to follow-up (Table 5). The latter group were found to be more likely to be male but did not differ on any of the psychosocial variables which predicted new abdominal pain onset.

Discussion

The present population-based, prospective study has demonstrated that approximately 1 in 20 of a general population sample, who were free of abdominal pain at baseline, reported new onset abdominal pain at follow-up. Baseline levels of

Table 5 Distribution of age, gender and psychosocial scale scores of participants and non-participants to the follow-up questionnaire

Demographics	Non-participants (n = 130)		Participants (n = 1551)		P-value ^a	
	n	(%)	n	(%)		
Age						
18–37	45	34.6	538	34.7		
38–49	40	30.8	497	32.0		
50–65	45	34.6	516	33.3	0.96	
Gender						
Female	90	69.2	884	57.0	0.01	
Psychosocial scales						
	Range	Median	IQR	Median	IQR	
GHQ ^b	0–12	0	0–3	0	0–3	0.71
Somatic symptoms	0–5	0	0–1	0	0–1	0.56
Fatigue	0–11	0	0–2	0	0–2	0.15
Health Anxiety	0–44	11	7–15	12	8–17	0.60
Illness Behaviour	0–24	4	2–8	5	3–9	0.73

^a All P-values were by Mann-Whitney U test except those for age and gender which were by χ^2 test.

^b General Health Questionnaire.

psychological distress, illness behaviour, health anxiety and fatigue were strong predictors of the new onset of abdominal pain in this group. In addition, reporting low back pain at baseline, a pain symptom thought not to be primarily organic in origin, significantly predicted new abdominal pain, while knee and shoulder pain, which are symptoms more likely to be associated with trauma, did not. Further analysis indicated that a high score on the Illness Behaviour scale and high levels of psychological distress were the two most important factors in predicting new onset abdominal pain at follow-up. The prospective nature of our study ensured that these factors were not a result of abdominal pain as the subjects did not have such pain when first studied.

Of the people who reported new abdominal pain at one-year follow-up, and for whom medical record information was available, one in seven consulted with GI symptoms. Of those who did consult, only one person was given a definite diagnosis by their GP. These findings strongly support the idea that a large proportion of presentations with abdominal pain in general practice may be functional in origin.

In interpreting our results it is important to consider the limitations of the present study. First, we aimed to identify those risk factors that were associated with reports of any abdominal pain in a general population sample. We have concluded that a functional disorder was the possible underlying diagnosis for the majority of people who complained of non-specific pain, as borne out in our GP records review. However, we do not have additional data to allow us to further classify these possible functional disorders according to published criteria, for example the Rome II criteria,²¹ and are therefore unable to comment on risk factors for specific disorders. The merit of the present findings is in identifying psychosocial risk factors for new onset cases of abdominal pain, which is often the primary presenting symptom to general practice, the majority of which appear to be unexplained.

Second, it is almost certain that we have missed new onset episodes of abdominal pain experienced during the 12-month period between the baseline survey and the follow-up survey. We were concerned about the validity of self-reported pain

symptoms over time. Respondents were therefore asked to report episodes of pain lasting at least 1 day during the previous month. Recall is more likely to be accurate by focussing on current pain and pain in the recent past and is notoriously inaccurate over a 12-month period.²² With this in mind we believe that asking subjects about their pain experience over a shorter period of time has provided us with more accurate information with regard to symptoms.

Third, in the present study, we identified new onset prevalent, not true incident, or first ever, cases of abdominal pain at follow-up. Risk factors for the onset of an incident case of abdominal pain may be different to those demonstrated in this study and we are unable to comment directly upon that hypothesis. However, first ever episodes of abdominal pain are likely to occur early in childhood²³ and may lead to functional disorders in adulthood.²⁴ Previous studies have shown that recurrent abdominal pain in children is associated with similar psychosocial factors such as illness behaviour and psychological distress as we have demonstrated in an adult population.²⁵ Whether these factors predict incident cases in children remains to be examined. Nevertheless, we have demonstrated that for the group of subjects who were pain free at baseline but who showed features of illness behaviour characterized by the prior propensity to seek medical care for symptoms, high levels of psychological distress, health anxiety and fatigue, a significant proportion reported a new onset abdominal pain 1 year later.

Finally, we have classified new onset abdominal pain according to symptoms outlined on a whole body manikin. It may be argued that this is an over simplistic way to classify abdominal pain and may lead to a degree of misclassification of subjects. However, these methods of classifying manikin-derived pain are routinely used in large scale epidemiological surveys and have construct validity.^{26,27} Research has demonstrated high inter-rater reliability between judges for quantifying clinical data found in pain drawings²⁸ and established them to be reliable measures of pain extent and location over time.²⁹ Nevertheless there may be a degree of misclassification of subjects although this is likely to be non-differential and lead to an underestimate of the reported associations.

Abdominal pain plays a large part in the symptomatology of functional GI disorders such as Irritable Bowel Syndrome (IBS). Psychological factors and adverse life events are often implicated in the aetiology of IBS.^{30,31} There is also evidence for the overlap of symptoms in different functional disorders. In one study of people with chronic fatigue, there was a point prevalence of IBS symptoms of 63%.³² As the majority of these studies have been cross-sectional, it is difficult to demonstrate whether these factors are predictors of onset, or merely a consequence, of symptoms. Furthermore, research into IBS has mainly taken place in primary or secondary care settings. The findings, therefore, cannot be easily extrapolated to a population level as consultation and referral behaviour, and recall bias of adverse life events render the subjects highly selected and unrepresentative of the general population.^{33,34}

The present population study has demonstrated that in a group of people free of abdominal pain, aspects of illness behaviour, psychological distress, health anxiety and fatigue were important predictors of new onset abdominal pain. These factors are features of somatization, the process through which distress manifests as bodily symptoms. A recent study carried out in the same centre demonstrated that indicators of somatization were the key predictors in the development of new chronic widespread pain, the symptomatic presentation of the fibromyalgia syndrome.³⁵ This gives weight to the hypothesis that FGID may be part of a wider spectrum of chronic unexplained disorders with some overlap in causality.³⁶ It may be that certain people with a susceptibility to chronic illness manifest symptoms across different disease modalities, but that the underlying pathogenesis and aetiology are essentially the same.

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Commentary: Functional abdominal pain: another unexplained physical symptom

Roger Jones

Hannay's concept of the symptom iceberg is widely recognized.¹ Well-being and asymptomatic disease are located at the broad base of the iceberg, or pyramid, above which lies that section of the population who are symptomatic but do not seek medical advice for their symptoms—the non-consulters. Symptom diary studies in the UK and the US have suggested that as few as 1 in 40 symptoms ever becomes the subject of a formal medical consultation. Instead individuals employ a range of strategies, involving formal and informal advisers and care-givers, before entering the process that turns people into patients. Above this self-care segment is primary care—first-contact care provided by general practitioners (GPs), emergency departments, other community-based health care professionals and, increasingly, telephone and web-based health advice services such as NHS Direct and NHS Direct on-line. Approaching the apex of the pyramid, patients may enter secondary and, finally, tertiary care, where they represent a highly-selected minority of the patient population.

This model encourages us to consider not only the descriptive and aetiological epidemiology of symptoms and disorders, but also to think about the factors leading to both illness onset and illness declaration, the recognition of symptoms, the inter-relationships between social, psychological and physical factors, the interplay of symptoms and health beliefs, the modulating effects of advice from kinship and kithship networks, the influence of health information, and the configuration of healthcare services which may encourage or obstruct access to care.

Many of these issues have been studied in relation to gastrointestinal symptoms. Castell has applied the 'iceberg' model to

gastro-oesophageal reflux disease² and the factors contributing to the decision to consult for dyspepsia and irritable bowel syndrome (IBS) have also been studied. These conditions have 1-year population prevalences of around 40% and 20%, respectively,^{3,4} but only one-third to one-quarter of individuals with these problems consult a GP. In the case of dyspepsia the impact of pain severity as a determinant of consultation is greatly outweighed by patients' concerns about the possibility of serious disease, including cancer and heart disease.⁵ In IBS pain severity plays a more prominent role, but anxiety and depression and fear of cancer are also important factors contributing to the decision to consult.⁶

Much less is known about the origins, incidence and experience of abdominal pain in the community, and Halder *et al.*'s paper from Manchester raises a number of interesting questions about the prevalence, incidence and causality of abdominal pain in the general population, and generates further questions about the impact of psychosocial factors on the onset and declaration of organic and non-organic abdominal syndromes.⁷ Although the baseline prevalence of abdominal pain appears low, particularly when considered in relation to the figures for dyspepsia and IBS, this is largely explained by their chosen definition of abdominal pain, namely pain lasting at least 24 hours. This is quite a restrictive definition, given the cyclical nature of many abdominal symptoms and the intermittent nature of more 'organic' abdominal pain, such as ulcer-like and reflux-like dyspepsia. However, some support for this population estimate comes from a larger survey of chronic pain in the community, conducted in the Grampian region of Scotland, in which over 50% of patients self-reported chronic pain, but to which figure abdominal pain contributed only a tiny proportion.⁸ Halder and colleagues followed up their community sample for 12 months, and found that approaching 5% of men and women reported new onset abdominal pain at

follow-up. These individuals were more likely to have high scores on fatigue, illness behaviour, and health anxiety scales, and multivariate analysis indicated that higher levels of psychological distress and prior illness behaviour were the major independent predictors of the onset of new abdominal pain. Although the numbers were small, it appears that only one in seven of these people consulted their GP with any kind of gastrointestinal symptoms ($n = 8$), and that five of these people had diarrhoea and three were described as having non-specific abdominal pain. These data are consistent with the very low incidence of new-onset dyspepsia in a 1-year follow-up of a community sample in the south of England.⁹

The Manchester group also found that back pain was positively associated with the onset of abdominal pain, and have gone on to speculate that not only were more of these patients suffering from a functional gastrointestinal disorder (FGID), but that the FGIDs form part of a continuum of non-physical symptoms which also include fibromyalgia, tension headache, chronic fatigue, atypical facial pain and non-cardiac chest pain.⁷ Publications in the psychological literature increasingly support this view, although caution is now expressed about the use of the term 'somatization' or the search for a single aetiological factor.¹⁰ Instead, the emphasis is on the potential contributions of biological, psychological, interpersonal and healthcare factors, and the need to construct an individualized aetiological formulation for each patient with unexplained chronic pain. Iatrogenic factors are particularly potent in the development and persistence of medically unexplained symptoms; doctors who appear uncertain about the problem and are unable to provide an explanation, who fail to convince patients that their complaints are regarded as genuine, who provide reassurance without a positive explanation, give ambiguous and contradictory advice, and indulge in excessive investigation and treatment are likely to launch their patients into a successful illness career.¹¹

The managements of patients with unexplained physical symptoms, including FGIDs, hinges on adequate assessment and the choice of an appropriate intervention. The identification of patients' health beliefs and concerns about their symptoms, with an open discussion of 'organic' and 'functional' diagnoses, combined with appropriate examination and investigations and a full explanation of the (usually negative) findings, are essential. In particular it is important to understand the patient's reaction to their symptoms and the way they cope with them, and to look carefully for psychiatric and social problems and family factors. The findings in the Manchester paper clearly support this approach, and given the importance of the psychosocial

factors identified in their survey, their findings also have implications for the design of therapeutic interventions in non-specific abdominal pain.

The low incidence of abdominal pain in the population reported in this study may deter further research into the natural history of the symptoms in the community and the subsequent design of intervention trials, because of the size of the population base required to identify a study cohort large enough for meaningful analysis. However, an alternative approach might be to assemble a cohort of patients with new-onset symptoms affecting other organ systems, including back pain, non-cardiac chest pain, generalized muscle and joint pain, tension headache, and atypical facial pain. The natural history of these symptoms could be documented in a longitudinal study and, with more information available from psychometric testing and the application of some of the psychosocial measures used by the Manchester group, general and system-specific interventions could be designed and trialled.

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