Psychoneurotic symptomatology in the irritable bowel syndrome: a study of reporters and non-reporters

G W WELCH, L C HILLMAN, E W POMARE

Abstract

An appreciable proportion of the general population have the irritable bowel syndrome but do not report it. Results of psychological assessments showed that outpatients with the syndrome and non-reporters of it were psychologically similar, but both groups showed more somatic distress than normal controls. Anxiety, depression, obsessive compulsion, and interpersonal sensitivity were similar in both groups with the syndrome and the normal controls.

The preponderance of women referred to outpatient clinics may reflect sociological factors rather than the severity of the irritable bowel syndrome.

Introduction

The irritable bowel syndrome is one of the most commonly encountered disorders in gastroenterological practice.[1,2] Screening of gastrointestinal function in samples of the general population has shown the prevalence of the syndrome to be as high as 17% and that equal numbers of men and women are affected.[3,4] Only a small proportion of these subjects, however, are referred to outpatient clinics for their symptoms, and most of those referred are women.[5,6] Previous studies have shown that patients with the irritable bowel syndrome score consistently higher than normal subjects and other patients on various psychometric scales and psychiatric ratings.[7-13] The patients with the syndrome in these studies have all, however, been patients referred either to outpatient clinics in hospitals or to private medical practices. Specialists may therefore be seeing either a psychoneurotic subset of the total population with the syndrome or those who are temporarily psychoneurotic as a result of living with its distressing physical symptoms.

We compared the psychological state of an outpatient group with the syndrome both with subjects with the syndrome who had not reported having it and with normal controls to test the hypothesis that outpatients with the syndrome are a psychoneurotic subgroup of the larger population with the syndrome.

Subjects and methods

This study was conducted with the approval of the research ethical committee of the Wellington Hospital Board.

Outpatients with the irritable bowel syndrome—This group comprised 26 consecutive outpatients diagnosed in the gastroenterology outpatient department, Wellington Hospital, as suffering from the irritable bowel syndrome as defined by Drossman *et al.*[1] At presentation a full clinical history was taken and a physical examination and sigmoidoscopy performed on each patient. Routine investigations included a full blood count; liver function tests; measurement of sedimentation rates and serum concentrations of protein, creatinine, and electrolytes; and a barium enema. Other investigations were carried out as necessary to exclude any underlying disease. The group comprised six men and 20 women, giving a ratio of men to women of 0·3. Their ages ranged from 17 to 60 with a mean of 36.

Non-reporters of the irritable bowel syndrome—This group comprised a normal population sample of 41 subjects with the syndrome who had not reported having it. These subjects were selected using Thompson and Keaton's method of screening for disorders of gastrointestinal function in 287 consecutive blood donors at the Wellington blood donor centre.[3] Symptoms that characterised the syndrome were abdominal pain relieved by defecation, mucus on the stools, abdominal distension, a feeling of incomplete bowel evacuation, and a change in frequency and consistency of stools at the onset of pain.[3] The blood donor centre was chosen as a source of normal population samples because psychometric research has shown donors to be similar to non-donors with regard to measures of psychoneurotic symptomatology[13,14] and also because the people attending the centre could get to the hospital easily. The sample comprised 20 men and 21 women, giving a ratio of men to women of 0·95. Their ages ranged from 17 to 62 with a mean of 30. The 41 non-reporters represented 14·1% of the total population screened, a prevalence similar to that found in other studies.[3,4]

Normal controls—This group comprised 60 subjects selected by using random numbers tables[15] from the 287 blood donors seen. There were 27 men and 33 women, giving a ratio of men to women of 0·82. Their ages ranged from 20 to 80 with a mean of 35. They provided a normal baseline for the psychometric tests administered to the two groups of patients with the irritable bowel syndrome.

Psychometric measurements—The Hopkins symptom check list is a self administered questionnaire of psychoneurotic symptoms that has been widely used since its introduction and is highly reliable. It has been used as a sensitive measure of the response to treatment with psychotropic drugs, as an index of stress, as a measure of psychiatric symptoms in various populations of patients and non-patients,[16-20] and in previous psychometric studies of the irritable bowel syndrome.[21,22] The five scales of the check list relate to somatisation, obsessive compulsion, depression, anxiety, and interpersonal sensitivity. Recent research by Walkey and McCormick using an improved analytical technique showed that three factors can replace the original five.[23] These are: general feelings of distress, which covers anxiety, depression, and interpersonal sensitivity; somatic distress, which corresponds with somatisation; and performance difficulty, which corresponds with the obsessive compulsion. The Walkey and McCormick modification of the check list was used in this study.

Procedure—All subjects completed the modified questionnaire. The outpatients with the irritable bowel syndrome did this after the second interview with the gastroenterologist, when all investigations had been completed and the syndrome diagnosed. The 41 blood donors who satisfied Thompson and Keaton's criteria for the syndrome[3] and the 60 normal controls were followed up by post and given the questionnaire and instructions. They were asked to complete the forms unaided to prevent others influencing their response and were assured of confidentiality.

Data analyses—After a non-parametric one way analysis of variance each group was compared with the others using the Mann-Whitney non-parametric U test to establish whether a significant overall difference existed between the groups.[24] Probability was set at the $\alpha^{-}=0{\cdot}05$ level of significance for the non-parametric analysis of variance and adjusted for the subsequent multiple pairwise comparisons to the $\alpha^{-}=0{\cdot}15$ level from the formula $\alpha^{-}=2\alpha/K(K-1)$ where K is the number of groups.[25]

Results

The table shows the results of the questionnaires in all three groups. For comparison, results from groups of American psychiatric outpatients,[18] American outpatients with the irritable bowel syndrome,[21] and student controls[23] are shown, but these were not included in the statistical analyses.

Somatic distress—Comparison of the scores showed a significant overall difference ($F=7{\cdot}18$, $p<0{\cdot}001$). Subsequent pairwise analysis showed that the score in the outpatients with the syndrome was significantly higher than that in the normal controls ($p<0{\cdot}01$) but not that in the non-reporters. The non-reporters also scored significantly more than the controls ($p<0{\cdot}001$).

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Mean (SD) scores for Hopkins symptom check list in six groups of subjects

	Present study					
	Outpatients with irritable bowel syndrome (n=26)	Non-reporters with irritable bowel syndrome (n=41)	Normal controls (n=60)	American psychiatric outpatients (n=1200)[18]	American outpatients with irritable bowel syndrome (n=17)[21]	Student controls (n=287)[23]
Somatic distress	18·1 *(4·0)	18·8 **(4·1)	15·8 (2·3)	22·5 (9·7)	18·9 (7·3)	15·9 (4·3)
General feelings of distress	35·9 (9·7)	36·1 (8·4)	33·2 (5·2)	56·7 (21·8)	41·6 (15·2)	35·9 (8·8)
Performance difficulty	12·7 (3·2)	14·7 (3·9)	12·3 (2·9)	17·7 (7·7)	17·8 (3·3)	13·1 (3·7)

*p<0·01 compared with normal controls.
**p<0·001 compared with normal controls.

General feelings of distress—Although an overall significant difference between groups was found (F=2·61, p<0·05), subsequent pairwise analysis showed no significant differences.

Performance difficulty—Overall, a significant difference between groups was found (F=5·40, p<0·002). Subsequent pairwise analysis, however, showed no significant differences.

Discussion

The hypothesis that patients with the irritable bowel syndrome are an atypical psychoneurotic group was tested here by comparing such patients with both a sample of non-reporters of the syndrome and normal controls. We found that patients with the syndrome and non-reporters both had significantly more somatic distress than normal controls. Comparison of our results with two reference groups, a sample of American patients with the syndrome[21] and a sample of American psychiatric patients,[18] showed that the group of American patients with the syndrome had scores similar to those of our two groups with the syndrome, while the group of psychiatric patients had much higher scores than all other groups.

The somatic distress subscale detects concern and worry associated with multiple somatic complaints, including headaches, breathlessness, and palpitations. Given that outpatients with the irritable bowel syndrome are generally in good physical health,[5] our finding of moderate levels of somatic distress in both reporters and non-reporters of the syndrome suggests that people who have experienced a painful, chronic relapsing condition such as the irritable bowel syndrome find additional non-gastrointestinal symptoms more distressing than normal subjects experiencing the same symptoms. In other words, these raised levels of somatic distress may reflect sensitisation to non-gastrointestinal symptoms as a result of the chronic disease. The actual incidence and severity of the non-gastrointestinal symptoms may not differ from those in normal subjects, but the perception of such symptoms may be associated with greater distress, compelling some patients to report their symptoms.

Our results for somatic distress showed, however, that subjects with unreported irritable bowel syndrome are similar to outpatients with the syndrome. It would therefore be unlikely that somatic distress alone determined who was referred to outpatient clinics. Given that most of the outpatients with the syndrome in this study were women (19 women, six men) and that earlier studies reported a ratio strongly in favour of women,[5] sociological factors rather than the severity of symptoms and associated somatic distress may have influenced referral. Research in sociological medicine has shown differences between the sexes in the reporting of illness[26,27] and bias of doctors in evaluation and treatment according to the sex of patients.[28,29] Such factors may be important in the irritable bowel syndrome and contribute to the distinct bias favouring referral of women. A study of patients with the syndrome reporting to general practitioners and of those subsequently referred would help to clarify this.

The comparisons of group means for performance difficulty and general feelings of distress showed two main points. Firstly, for these subscales no significant differences existed between the three groups in the study. The items that make up these two subscales are comparable with the subscales on the Hopkins symptom check list of anxiety, depression, interpersonal sensitivity, and obsessive compulsion. The scores of a group of American outpatients with the syndrome[19] and a group of American psychiatric outpatients[18] were included for reference purposes, and, interestingly, the scores of the American group with the syndrome were similar to those of the two groups with the syndrome in this study, and the scores of the psychiatric group were appreciably higher than those of all other groups. These results were unexpected, given the importance attributed to depression and anxiety by earlier researchers.[7,10-13]

These differences may be explained by differences in the psychometry used. Walkey and McCormick have developed an analytical technique that has enabled them to improve both the clarity and the reproducibility of the factors making up the Hopkins sympton check list. Other measures used in assessing psychoneuroticism in patients with the irritable bowel syndrome need further refinement. For example, the six factor Middlesex Hospital questionnaire[30] has been used to show that a moderate degree of psychoneuroticism exists among patients with the syndrome compared with normal controls.[8,13] Although the subscales of this questionnaire have been shown to discriminate between psychiatric patients and normal subjects, however, they have not been convincingly analysed and were validated only in as far as the scores of psychiatric patients accorded with clinical ratings of independent psychiatrists.[30] Furthermore, there is evidence that psychiatric outpatients with anxiety states cannot be distinguished from those with depressive illness on the anxiety and depression subscales[31] and that the hysteria subscale appears to measure extraversion.[32]

It is also important to consider the methods of statistical analysis used when discussing weaknesses of earlier psychometric studies. It is evident that when three or more groups have been compared using a particular psychometric test[7,8] few researchers have performed an initial analysis of variance to establish whether any overall differences existed before proceeding with pairwise comparisons using a suitably corrected level of significance.[24] Failure to do this would increase the probability of researchers detecting chance differences between pairs of groups.

We conclude that the improvements in the psychometric tests, the statistical analysis, and the type of control groups used in this study have clarified the psychoneurotic state of both outpatients with the irritable bowel syndrome and subjects with unreported symptoms of the syndrome. As measured by the subscales of performance difficulty and general feelings of distress, the irritable bowel syndrome does not appear to be associated with depression, anxiety, obsessive compulsion, or interpersonal sensitivity, as reported in earlier studies. Subjects with the syndrome, whether they do or do not report their symptoms, are, however, more somatically distressed than normal subjects. We suggest that the chronic relapsing nature of the syndrome sensitises sufferers to the psychological impact of other bodily symptoms and leads to worry and distress, which manifest as somatic distress. The preponderance of women referred to outpatient clinics may reflect sociological factors rather than the severity of the syndrome, but further studies are needed to clarify this point.

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References

1 Drossman DA, Powell DW, Sessions JT. The irritable bowel syndrome. *Gastroenterology* 1977;73:811-22.
2 Ferguson A, Sircus W, Eastwood MA. Frequency of 'functional' gastrointestinal disorders. *Lancet* 1977;ii:613-4.
3 Thompson WG, Keaton KW. Functional bowel disorders in apparently healthy people. *Gastroenterology* 1980;79:283-8.
4 Drossman DA, Sandler RS, McKee DC, *et al*. Bowel patterns among subjects not seeking health care. *Gastroenterology* 1982;83:529-34.
5 Fielding JF. The irritable bowel syndrome. Part I. Clinical spectrum. *Clinical Gastroenterology* 1977;6:607-22.
6 Hillman LC, Stace NH, Pomare EW. Irritable bowel patients and their long-term response to a high fiber diet. *Am J Gastroenterol* 1984;79:1-7.
7 Esler MD, Goulston KJ. Levels of anxiety in colonic disorders. *N Engl J Med* 1973;288:16-20.
8 Palmer RL, Stonehill E, Crisp AH, *et al*. Psychological characteristics of patients with the irritable bowel syndrome. *Postgrad Med J* 1974;50:416-9.
9 Latimer P, Sarna S, Campbell D, *et al*. Colonic motor and myoelectrical activity: a comparative study of normal subjects, psychoneurotic patients and patients with irritable bowel syndrome. *Gastroenterology* 1981;80:893-901.
10 Hislop IG. Psychological significance of the irritable colon. *Gut* 1971;12:452-7.
11 Liss JL, Alpers DH, Woodruff RA. The irritable colon syndrome and psychiatric illness. *Diseases of the Nervous System* 1973;34:151-7.
12 Young ST, Alpers DH, Norland CC, *et al*. Psychiatric illness and the irritable bowel syndrome. *Gastroenterology* 1976;70:162-6.
13 Welch GW, Stace NH, Pomare EW. Specificity of psychological profiles of irritable bowel syndrome patients. *Aust NZ J Med* 1984;14:101-4.
14 Boe GP, Ponder LD. Blood donors and non-donors: a review of the research. *Am J Med Technol* 1981;47:248-53.
15 Diem K, ed. *Documenta Geigy. Scientific tables*. 6th ed. St Leonards, New South Wales: Geigy Pharmaceuticals, 1962.
16 Lipman RS, Cole JO, Park LC, *et al*. Sensitivity of symptom and non-symptom-focused criteria of outpatient drug efficacy. *Am J Psychiatry* 1965;122:24-7.
17 Covi L, Lipman RS, Pattison JH, *et al*. Length of treatment with anxiolytic-sedatives and response to their sudden withdrawal. *Acta Psychiatr Scand* 1973;49:51-64.
18 Derogatis LR, Lipman RS, Rickels K. The Hopkins symptom check list. *Behav Sci* 1974;19:1-14.
19 Jacobs R, Kafry D, Zedeck S. Expectations of behaviourally anchored rating scales. *Personnel Psychology* 1980;33:595-640.
20 Taylor AJW. Adaption of New Zealand research personnel in the Antarctic. In: OG Edholm, EK Gunderson, eds. *Polar human biology*. London: Heinemann Medical Books, 1973:417-29.
21 Whitehead WE, Engel BT, Schuster MM. Irritable bowel syndrome. Physiological and psychological differences between diarrhoea-predominant and constipation-predominant patients. *Dig Dis Sci* 1980;25:404-13.
22 Wise TN, Cooper JN, Ahmed S. The efficacy of group therapy for patients with irritable bowel syndrome. *Psychosomatics* 1982;23:465-9.
23 Walkey FH, McCormick IA. Multiple replication of factor structure. A logical solution for a number of factor problems. *Multivariate Behavioural Research* (in press).
24 Downie NH, Heath RW. *Basic statistical methods*. 3rd ed. New York: Harper International, 1970.
25 Hettmansperger TP. *Statistical inference based on ranks*. New York: J Wiley, 1984.
26 Nathanson CA. Sex illness and medical care: a review of data theory and method. *Soc Sci Med* 1977;11:13-25.
27 Lewis CE, Lewis MA. The potential impact of sexual equality on health. *N Engl J Med* 1977;297:863-9.
28 Bernstein B, Kane R. Physicians' attitudes towards female patients. *Med Care* 1981;19:600-8.
29 Hooper EM, Loretto MC, Goodwin JM, *et al*. Patient characteristics that influence physician behaviour. *Med Care* 1982;20:630-8.
30 Crown S, Crisp AH. A short clinical diagnostic self-rating scale for psychoneurotic patients. The Middlesex Hospital questionnaire. *Br J Psychiatry* 1966;112:917-23.
31 Crisp AH, Jones M, Gaynor P, *et al*. The Middlesex Hospital questionnaire. A validity study. *Br J Med Psychology* 1978;51:269-80.
32 Crockett R. A short self-rating scale in the remand setting. *Br J Psychiatry* 1969;115:1141-50.

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Early neurological complications of coronary artery bypass surgery

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Abstract

A prospective study of 312 patients undergoing elective coronary artery bypass surgery was undertaken to determine the incidence, severity, and functional impact of postoperative neurological complications. Detailed evaluation of the patients showed that neurological complications after surgery were common, occurring in 191 of the 312 patients (61%). Although such a high proportion of the total developed detectable changes, serious neurological morbidity was rare. Neurological disorders resulted in death in only one patient (0·3%) and severe disability in only four (1·3%). Forty eight patients were mildly disabled during the early postoperative period, and the remaining 138 with neurological signs had no serious functional disability.

The postoperative neurological disorders detected included one death from cerebral hypoxic damage. Prolonged depression of conscious level was observed in 10 patients (3%) and definite stroke in 15 (5%); 78 (25%) developed ophthalmological abnormalities and 123 (39%) primitive reflexes; postoperative psychosis was observed in four (1%); and 37 (12%) developed disorders of the peripheral nervous system.

The incidence of serious neurological problems such as fatal cerebral damage, stroke, and brachial plexopathy is in accordance with experience elsewhere. Lesser abnormalities, whose detection required detailed neurological examination, were much commoner than expected from previous reports.

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Introduction

Neurological complications of heart surgery have been recognised since the early description by Fox *et al* in 1954.[1] Extracorporeal circulation has been implicated as a source of neurological morbidity in many subsequent studies.[2-8] The neurological disorders detected have affected all levels of the nervous system. Their reported incidence has varied widely, from 0 to 100%,[9,10] depending mainly on the timing of postoperative assessment, the neurological skill of the assessors, and other differences in study design. The incidence of severe neurological complications has undoubtedly decreased owing to improvements in surgical and anaesthetic methods and particularly in extracorporeal circulation equipment.[11,12] Milder complications have attracted less attention, perhaps because they are transient or are less of a threat to life than the primary cardiac disorder.

Coronary artery bypass surgery using saphenous vein grafts was introduced by Favaloro in 1967.[13] This procedure has become increasingly important in the management of patients with ischaemic heart disease. Compared with patients undergoing other