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The Irritable Bowel Syndrome and Psychiatric Disorders in the Community: Is There a Link?

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OBJECTIVE: Psychiatric morbidity is high among patients who present to referral centers with irritable bowel syndrome (IBS). However, few studies have investigated the relationship between psychiatric disturbance and IBS in community samples. We hypothesized that psychiatric disorders are linked to IBS in the general community, but this is influenced by the criteria used to establish a diagnosis of IBS.

METHODS: The data were collected from a birth cohort born in Dunedin (New Zealand) between April 1972 and March 1973. This cohort consisted of 1037 members (52% male), who were assessed at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, and 26 yr. GI symptoms were recorded at age 26 yr, using an abbreviated version of the Bowel Symptom Questionnaire; psychiatric history was obtained at ages 18 and 21 yr, using a modified version of the Diagnostic Interview Schedule.

RESULTS: The prevalence of IBS was 12.7% according to the Manning criteria and 4.3% according to the Rome II criteria. The IBS was not significantly related to a diagnostic history for psychiatric illness overall, nor to a history of anxiety disorders, depressive disorders, and substance dependence. These results were independent of the IBS criteria used; there was no association between psychiatric history and IBS when IBS was defined according to the Manning criteria ($p = 0.11$ to 0.98) or the Rome criteria ($p = 0.18$ to 0.92); Rome and Manning criteria subjects did not significantly differ from each other in terms of psychiatric history ($p = 0.16$ to 0.89).

CONCLUSION: In a cohort of young adults with IBS from New Zealand, IBS appears to not be related to psychiatric disorders. (Am J Gastroenterol 2001;96:1072–1079. © 2001 by Am. Coll. of Gastroenterology)

INTRODUCTION

The irritable bowel syndrome (IBS) is a common yet still poorly understood disorder (1–3). In studies from referral centers, the frequency of depression, anxiety, and other major *Diagnostic and Statistical Manual* (DSM) Axis 1 psychiatric disorders is high in patients with IBS (1). Indeed, up to 60% with IBS have been reported to have a psychiatric disorder, which was considerably higher than the rate of psychiatric disorders in organic disease or healthy controls (4–10), suggesting a causal association. However, it is largely unknown whether this rate of psychiatric disorders is as high in the community, or whether psychiatric disorders apply exclusively to those subjects who have sought health care. This issue can only be addressed in adequate population-based studies.

Studies from volunteers in the United States have reported that psychological disturbances were higher in IBS patients than in those who had the symptoms but who had not sought medical care (IBS nonpatients) (11, 12). However, these studies did not evaluate psychiatric diagnoses. We postulated that psychiatric disorders would be highly prevalent in subjects from the community who meet diagnostic criteria for the IBS compared to controls.

Following the recognition by Manning *et al.* that symptoms could positively identify patients with IBS (13, 14), the Manning criteria have been applied in epidemiological studies to determine the prevalence of IBS; approximately 10–15% of the population report IBS symptoms using these criteria (15). Subsequently, the more restrictive Rome criteria have been applied for diagnosis; the prevalence of IBS is 4–9% applying these new criteria (16). Whether those subjects who only fulfill the Manning but not Rome criteria truly have IBS is unclear. Moreover, whether applying more rigorous symptom criteria identifies those with higher or lower rates of psychiatric disturbance is unknown. We hypothesized that those subjects who fulfill the Rome II criteria for IBS would have less psychiatric disturbance than those fulfilling the Manning criteria but not the Rome criteria. We speculated that subjects fulfilling the Manning criteria alone would be those with a somatic disorder rather than a true functional disorder of the GI tract. We tested these hypotheses in a birth cohort that has very carefully categorized subjects in the first 26 yr of life in terms of both psychiatric diagnoses and GI tract symptoms.

MATERIALS AND METHODS

Sample

Participants were members of the Dunedin Multidisciplinary Health and Development Study. This is a longitudinal investigation of the health, development, and behavior of a complete cohort born between April 1, 1972, and March

31, 1973, in Dunedin, a city of approximately 120,000 on New Zealand's South Island (17).

Perinatal data were obtained at delivery. The children were traced for follow-up at the age of 3 yr, and 91% of the eligible births participated in the assessment. This provided a base sample of 1037 (52% male) for the longitudinal study (17). The cohort has been reassessed with a diverse array of psychological, medical, and sociological measures at ages 3 (n = 1037), 5 (n = 991), 7 (n = 954), 9 (n = 955), 11 (n = 925), 13 (n = 850), 15 (n = 976), 18 (n = 993), 21 (n = 992), and most recently at age 26 yr (n = 980).

The children's fathers were representative of the social class distribution in the general population of similar age in New Zealand. The study members were predominantly of European ancestry. Fewer than 7% of the sample identified themselves at age 18 yr as Maori or Polynesian, which matches the ethnic distribution of the South Island of New Zealand (17).

Definition of IBS

IBS was evaluated at age 26 yr using an abbreviated version of the Bowel Symptom Questionnaire (18, 19). The Bowel Symptom Questionnaire is a reliable and valid instrument that has been used extensively in epidemiological studies of disorders of the GI tract. The abbreviated version was self-administered and took approximately 10 min to complete.

Both the Rome II criteria and the Manning criteria were evaluated in the prior 12 months. The Rome II criteria required two of the following three symptoms (20): abdominal pain or discomfort relieved with defecation; onset associated with a change in stool frequency; or onset associated with a change in form (appearance) of stool.

The Manning criteria required abdominal pain or discomfort plus two of the following six symptoms (15): pain relief by defecation; looser stools at onset of pain; more frequent bowel movements at onset of pain; abdominal distension; mucus per rectum; and feelings of incomplete rectal emptying.

Mental Health

Mental health diagnoses were obtained at ages 18 and 21 yr using a modified version of the Diagnostic Interview Schedule (21 and Robin LN, Helzer JE, Cottler L, Goldring E. Diagnostic Interview Schedule, Version III-R. Unpublished manuscript, Washington University, St. Louis, 1989). The modifications consisted of: 1) including only those questions pertaining to the assessment of DSM-III-R criteria; 2) assessing only the symptoms that occurred within the past 12 months; 3) assessing only the more commonly occurring diagnoses for this age group; and 4) limiting options to "0 = no," "1 = yes, sometimes," and "2 = yes, definitely." Only those responses receiving a "2" were considered severe enough to be entered into the diagnostic algorithms. Diagnoses were determined by computer-run algorithms that followed explicit criteria specified by the DSM-III-R.

Diagnoses were derived for the following 15 disorders at age 21 yr: 1) six anxiety disorders: generalized anxiety disorder (n = 18, 1.9%), obsessive-compulsive disorder (n = 67, 7.1%), panic disorder (n = 6, 0.6%), agoraphobia (n = 36, 3.8%), social phobia (n = 92, 9.7%), and simple phobia (n = 80, 8.4%); 2) three mood disorders: major depressive episode (n = 161, 16.8%), manic episode (n = 19, 2.0%), and dysthymia (n = 28, 3.0%); 3) two eating disorders: anorexia nervosa (n = 4, 0.4%) and bulimia nervosa (n = 9, 1.0%); 4) two substance disorders: alcohol dependence (n = 94, 9.8%) and cannabis dependence (n = 91, 9.6%); 5) one Axis-II DSM-III-R disorder: antisocial personality disorder (n = 31, 3.2%); and 6) one category of nonaffective psychosis (n = 39, 4.1%), which consisted of the positive psychotic symptoms (criterion A of the DSM-III-R, pp. 194–195) for the diagnosis of schizophrenia and schizophreniform disorders, with the exclusion of such symptoms occurring solely under the influence of alcohol or drugs, or during a major depressive episode (22).

The same set of diagnoses were derived at the age 18-yr assessment, with the exception that information concerning mania and nonaffective psychosis was not sought, and conduct disorder (n = 51, 5.5%) was diagnosed instead of the Axis II, DSM-III-R antisocial personality disorder category used at age 21 yr (23).

The mental health interviewers were tertiary qualified and were trained in the administration of the Diagnostic Interview Schedule. Reliability of the age 18-yr and age 21-yr mental health assessments was very good; at age 18 yr, the average kappa coefficient across three families of disorders (anxiety, depressive, and substance dependence disorder) was 0.70 and was >0.85 across the same three families at age 21 yr (23).

Four categories of psychiatric diagnosis were evaluated:

- Any psychiatric disorder: This included all subjects who had received a diagnosis of psychiatric disorder (any DSM-III-R Axis I or Axis II diagnosis) at age 18 or 21 yr;
- Any anxiety disorder: All subjects who had received a diagnosis of anxiety disorder (*i.e.*, any one or more of generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, agoraphobia, social phobia, or simple phobia) at age 18 or 21 yr;
- Any depression: All subjects who had received a diagnosis of major depressive episode or dysthymia at age 18 or 21 yr;
- Any substance dependence: All subjects who had received a diagnosis of alcohol or cannabis dependence at 18 or 21 yr.

Subjects with psychiatric comorbidities were included in all analyses, and were coded to each diagnostic category as appropriate. For example, subjects with a diagnosis of both anxiety and depression were included in three categories—any psychiatric diagnosis, any anxiety disorder, and any depression. We recognize that subjects with comorbid con-

ditions may represent a more severe psychiatric group. However, sample numbers were too small to evaluate these subjects separately.

Statistical Analysis

Preliminary analyses showed problems with small cell counts in cross-tabulations of IBS with psychiatric diagnosis, when psychiatric diagnosis was classified as no diagnosis *versus* diagnosis at age 18 yr only *versus* diagnosis at age 21 yr only *versus* diagnosis at both age 18 and 21 yr. Accordingly, the data were recoded to reflect three groups—no diagnosis, episodic psychiatric disorder (a diagnosis at age *either* 18 *or* 21 yr) and chronic psychiatric disorder (a diagnosis at *both* age 18 *and* 21 yr). This approach was adopted for all four categories of diagnosis.

The data for any psychiatric disorder and for specific psychiatric diagnoses is presented as prevalence rates, stratified by group membership (no IBS, Rome criteria IBS, and Manning criteria IBS). Associations between psychiatric diagnoses and group membership were summarized using Pearson's χ^2 test.

Three sets of *a priori* comparisons were performed. Separate analyses examined: 1) psychiatric history among subjects with Manning criteria IBS (this group included those who simultaneously met the Rome criteria) compared to non-IBS controls: 2) psychiatric history among subjects with Rome criteria IBS compared to controls (the control group included those who met Manning but not Rome criteria for IBS); and 3) and psychiatric history among Rome criteria IBS compared to Manning criteria IBS. Comparisons were expressed as gender-adjusted odds ratios (OR) with 95% confidence intervals (CI). For each category of diagnosis (any psychiatric diagnosis, anxiety, depression, and substance dependence), those with no diagnosis formed the reference group; odds ratio reflect the odds of reporting IBS (as defined) among those with a history of episodic and chronic psychiatric disorder.

The analyses were completed using the SPSS (Chicago, IL) statistical package. All p values calculated were two-tailed; effects were assessed at the 5% α level of significance.

RESULTS

In total 890 subjects had complete data concerning IBS at age 26 yr and psychiatric diagnosis at ages 18 and 21 yr. Of these, 452 subjects were male and 438 were female. The prevalence of IBS was 4.3% according to the Rome II criteria (Table 1); a further 12.7% met the Manning criteria for IBS, but failed to meet the Rome II criteria. The association between IBS group membership and gender was not significant ($\chi^2 = 5.31$, $p = 0.07$), although the rates of Rome and Manning criteria IBS were somewhat higher among females compared to males (Rome: 5.3% *vs* 3.3%; Manning: 14.6% *vs* 10.8%).

Prevalence estimates for the four categories of psychiatric diagnosis are shown in Table 2. The prevalence of psychiatric diagnosis at 18 and/or 21 yr was 53.7% for any disorder, 32.7% for anxiety disorder, 29.7% for depression, and 21.2% for substance dependence. Gender was significantly associated with diagnosis for any disorder ($\chi^2 = 22.17$; $p < 0.0001$), anxiety ($\chi^2 = 39.65$; $p < 0.0001$), depression ($\chi^2 = 45.90$; $p < 0.0001$), and substance dependence ($\chi^2 = 35.60$; $p < 0.0001$). The general trend suggested higher rates of diagnosis among females for any disorder, anxiety and depression, but higher rates of diagnosis among males for substance dependence.

Table 1. Irritable Bowl Syndrome (IBS) Group Membership by Gender

	No IBS % (n)	Rome II Criteria IBS % (n)	Manning Criteria IBS* % (n)
Women	80.1 (351)	5.3 (23)	14.6 (64)
Men	85.8 (388)	3.3 (15)	10.8 (49)
Total	83.0 (739)	4.3 (38)	12.7 (113)

* Excludes those who also met the Rome Criteria for IBS.

Psychiatric Diagnoses by Group Membership

Table 3 shows prevalence estimates for episodic and chronic psychiatric disorder stratified by IBS group membership. There was a tendency for higher rates of chronic psychiatric disorder, but lower rates of episodic disorder, among Rome II criteria subjects compared to Manning criteria subjects and controls. However, IBS group membership was not significantly related to a history of *any* psychiatric disorder ($\chi^2 = 3.03$; $p = 0.55$), or to a history of anxiety disorder ($\chi^2 = 2.55$; $p = 0.64$), depression ($\chi^2 = 6.48$; $p = 0.17$), or substance dependence ($\chi^2 = 0.76$; $p = 0.94$).

Rome Criteria IBS Versus *Manning Criteria IBS*

Table 4 shows comparisons between those who met the Rome II criteria for IBS and those who met the Manning criteria alone. The odds ratios suggested that Rome II criteria IBS was slightly more common among those with chronic psychiatric disorder than among those with no disorder or episodic illness. When compared to the relevant reference groups, the odds of meeting the Rome II criteria were modestly elevated among those with chronic psychiatric illness (any diagnosis: OR = 1.17; 95% CI: 0.48–2.86), among those with chronic anxiety (OR = 1.35; 95% CI: 0.45–4.00), and among those with chronic depression (OR = 1.45; 95% CI: 0.45–4.69), but were not statistically significant. There was no evidence that the Rome II criteria was linked to a history of substance dependence.

Psychiatric History and Manning Criteria for IBS

There was no relationship between psychiatric history and IBS defined according to the Manning criteria (Table 5). The odds ratios were close to unity for episodic and chronic psychiatric illness (any diagnosis: OR = 1.00 and 1.02, respectively), for episodic and chronic anxiety (OR = 1.05 and 1.04, respectively), and for episodic and chronic substance dependence (OR = 0.88 and 1.06, respectively). Episodic and chronic depression were associated with an

Table 2. Prevalence of Psychiatric Diagnosis by Gender

	No Diagnosis % (n)	Age 18 only % (n)	Age 21 only % (n)	Age 18 and 21 % (n)
Any disorder				
Women	40.0 (175)	18.0 (79)	18.5 (81)	23.5 (103)
Men	52.4 (237)	8.8 (40)	16.6 (75)	22.1 (100)
Total	46.3 (412)	13.4 (119)	17.5 (156)	22.8 (203)
Anxiety				
Women	57.5 (252)	15.3 (67)	11.6 (51)	15.5 (68)
Men	76.8 (347)	9.7 (44)	7.1 (32)	6.4 (29)
Total	67.3 (599)	12.5 (111)	9.3 (83)	10.9 (97)
Depression				
Women	59.8 (262)	15.5 (68)	15.1 (66)	9.6 (42)
Men	80.5 (364)	7.7 (35)	7.5 (34)	4.2 (19)
Total	70.3 (626)	11.6 (103)	11.2 (100)	6.9 (61)
Substance dependence				
Women	85.8 (376)	5.5 (24)	4.6 (20)	4.1 (18)
Men	71.9 (325)	4.9 (22)	14.2 (64)	9.1 (41)
Total	78.8 (701)	5.2 (46)	9.4 (84)	6.6 (59)

elevated odds of meeting IBS criteria (OR = 1.31 and 1.67, respectively), although the effects were not statistically significant.

Psychiatric History and Rome Criteria for IBS

Table 6 shows comparisons between Rome II criteria subjects and the remaining sample (Manning criteria and controls). The odds of meeting Rome II criteria were modestly elevated among those with chronic psychiatric illness (any diagnosis: OR = 1.13; 95% CI: 0.53–2.44), among those with chronic anxiety (OR = 1.27; 95% CI: 0.50–3.23), and among those with chronic depression (OR = 2.01; 95% CI: 0.73–5.55), when compared to their respective reference groups. However, the odds ratios failed to achieve statistical significance. There was no evidence that IBS by the Rome II criteria was linked to higher rates of episodic psychiatric disorders, or a history of substance dependence.

DISCUSSION

These results suggest that a diagnosis of IBS at age 26 yr is not associated with psychiatric history as reflected by DSM-III-R diagnoses at ages 21 and 18 yr. These findings held for all diagnoses combined, and for the individual diagnoses of anxiety disorder and depression. Moreover, the Rome and Manning criteria failed to discriminate between IBS subjects with and without a history of psychiatric illness.

In this sample, the number of subjects who met the Manning or Rome criteria were not large (n = 113 and 38, respectively). Did a lack of study power account for the negative findings? We anticipated based on the available literature that subjects with IBS would have a prevalence of psychiatric disorders at least 10% higher than controls; indeed, much larger differences have been reported (4–10, 25–32) (Table 7). Applying this effect size, the present study

Table 3. Prevalence of Psychiatric Diagnosis by IBS Group Membership

	No IBS % (n)	Rome II Criteria IBS % (n)	Manning Criteria IBS* % (n)
Any diagnosis			
No diagnosis of pyschiatric disorder†	46.5 (344)	50.0 (19)	43.4 (49)
At 18 or 21 yr	30.7 (227)	21.1 (8)	35.4 (40)
At 18 and 21 yr	22.7 (168)	28.9 (11)	21.2 (24)
Anxiety diagnosis			
No diagnosis of anxiety disorder	67.8 (501)	68.4 (26)	63.7 (72)
At 18 or 21 yr	21.5 (159)	15.8 (6)	25.7 (29)
At 18 and 21 yr	10.7 (79)	15.8 (6)	10.6 (12)
Depression			
No diagnosis of depression	71.9 (531)	63.2 (24)	62.8 (71)
At 18 or 21 yr	21.9 (162)	23.7 (9)	28.3 (32)
At 18 and 21 yr	6.2 (46)	13.2 (5)	8.8 (10)
Substance dependence			
No diagnosis of substance dependence	78.3 (579)	81.6 (31)	80.5 (91)
At 18 or 21 yr	15.0 (111)	13.2 (5)	12.4 (14)
At 18 and 21 yr	6.6 (49)	5.3 (2)	7.1 (8)

* Excludes subjects also meeting Rome II Criteria for IBS.

† This group consists of individuals who did not meet criteria for any psychiatric diagnosis in the 12-mo period before either the age 18 or the age 21 assessments (*i.e.*, a cumulative figure from these two assessments).

Table 4. Psychiatric Diagnosis: Rome IBS *Versus* Manning IBS

Diagnosis	Odds Ratio	95% CI	*p* Value
Any diagnosis			
No diagnosis of pyschiatric disorder	1.00		
At 18 or 21 yr	0.51	0.20–1.30	0.16
At 18 and 21 yr	1.17	0.48–2.86	0.72
Anxiety diagnosis			
No diagnosis of anxiety disorder	1.00		
At 18 or 21 yr	0.57	0.21–1.53	0.26
At 18 and 21 yr	1.35	0.45–4.00	0.59
Depression			
No diagnosis of depression	1.00		
At 18 or 21 yr	0.82	0.34–1.97	0.66
At 18 and 21 yr	1.45	0.45–4.69	0.54
Substance dependence			
No diagnosis of substance dependence	1.00		
At 18 or 21 yr	1.08	0.36–3.28	0.89
At 18 and 21 yr	0.77	0.15–3.90	0.75

was powered to detect a difference between controls and IBS as defined by the Manning criteria with a power of ≥80% for anxiety, depression, and substance dependence at ages 18 and 21 yr. We observed that when classified according to the Rome criteria, IBS subjects were slightly more likely to report a history of chronic psychiatric illness, as well as a history of chronic anxiety and chronic depression. This finding held in comparison with population controls, as well as in comparisons with subjects who met the Manning criteria alone. We acknowledge that only 38 subjects met the Rome criteria, and that comparisons involving this group are likely to be influenced by a lack of statistical power. However, the effect sizes are too small to be of theoretical or clinical importance, and we contend that our conclusions will not be influenced by any type 2 error.

A population-based study from the Epidemiological Catchment Area project in the United States has reported that lifetime psychiatric disorders were more common in those with possible lifetime functional GI symptoms than those without, including major depression (8% *vs* 3%), agorophobia (10% *vs* 4%), and panic disorder (3% *vs* 1%) (32). Similarly, Lydiard *et al.* (33) reported that individuals with panic disorder also endorsed significantly higher rates of IBS-like symptoms. North *et al.* (31) found that women reported more medically unexplained chronic GI symptoms and those with two or more symptoms endorsed higher rates of lifetime psychiatric disorders. However, adequate research criteria for the functional GI disorders including IBS were not applied; in particular, the GI symptoms did not necessarily occur together and may have been present at anytime in the past, and the prevalence of symptoms was significantly lower than found in the general population (15, 16, 19).

Contrary to our expectations, a history of psychiatric disorder was less common among subjects who met the Manning criteria alone, compared to those who met the Rome criteria (21% *vs* 29% for chronic disorder *vs* any diagnosis), although the differences were not significant. We predicted that the Rome criteria would "select" those subjects with a true functional disorder and exclude those

Table 5. Psychiatric Diagnosis: Manning Criteria IBS* *Versus* Controls

Diagnosis	Odds Ratio	95% CI	*p* Value
Any diagnosis			
No diagnosis of psychiatric disorder	1.00		
At 18 or 21 yr	1.00	0.67–1.51	0.98
At 18 and 21 yr	1.02	0.65–1.60	0.93
Anxiety diagnosis			
No diagnosis of anxiety disorder	1.00		
At 18 or 21 yr	1.05	0.68–1.61	0.84
At 18 and 21 yr	1.04	0.59–1.84	0.88
Depression			
No diagnosis of depression	1.00		
At 18 or 21 yr	1.31	0.86–1.98	0.21
At 18 and 21 yr	1.67	0.89–3.14	0.11
Substance dependence			
No diagnosis of substance dependence	1.00		
At 18 or 21 yr	0.88	0.52–1.49	0.63
At 18 and 21 yr	1.06	0.52–2.17	0.87

* Includes those who simultaneously met Rome II criteria.

Table 6. Psychiatric Diagnosis: Rome IBS *Versus* Controls*

Diagnosis	Odds Ratio	95% CI	*p* Value
Any diagnosis			
No diagnosis of psychiatric disorder	1.00		
At 18 or 21 yr	0.57	0.24–1.33	0.19
At 18 and 21 yr	1.13	0.53–2.44	0.75
Anxiety diagnosis			
No diagnosis of anxiety disorder	1.00		
At 18 or 21 yr	0.64	0.26–1.60	0.34
At 18 and 21 yr	1.27	0.50–3.23	0.61
Depression			
No diagnosis of depression	1.00		
At 18 or 21 yr	1.05	0.47–2.34	0.90
At 18 and 21 yr	2.01	0.73–5.55	0.18
Substance dependence			
No diagnosis of substance dependence	1.00		
At 18 or 21 yr	0.95	0.36–2.51	0.92
At 18 and 21 yr	0.85	0.20–3.66	0.83

* Includes all subjects who failed to meet Rome II criteria for IBS.

with a history of psychiatric disorder. Although we applied the Rome II criteria, which are less complex when compared to the Rome I criteria, these are now the gold standard in clinical research (1, 20). Hence, the Rome and Manning criteria may identify slightly different IBS populations (16), and this needs to be considered when conducting research in the field, but the criteria seem not to be strongly confounded by psychiatric diagnoses.

We do not consider that selection bias will have influenced the present results. The population cohort assembled has been very carefully followed-up over 26 yr with more than 90% of the sample providing prospective data at regular intervals. This is a relatively unique resource for evaluating the natural history and risk factors for fluctuating conditions such as IBS. We applied a validated symptom measure and well-standardized research criteria for IBS. The prevalence of IBS in our study for both the Rome and Manning criteria was comparable to estimates obtained in the U.S., Australia, and Europe (15, 16, 19, 34–37). Similarly, the total 12-month prevalence of mental disorder in the Dunedin sample at age 21 yr (40.4%) closely matches the 12-month prevalence for young adult subjects in the U.S.

Table 7. Prevalence of Pyschiatric Disorder in Functional Bowel Disorder and Irritable Bowel Syndrome Using Standarized Research Pyschiatric Interviews

Author (yr) (reference number)	Number of Subjects	Instrument for Psychiatric Disorder	Functional Bowel Disorders (%)	Organic Gastrointestinal Disorders (%)	Healthy Controls (%)
Liss *et al*. (1973) (29)	25 [IBS]	SI	92		
Young *et al*. (1976) (30)	29 [IBS]	SI	72		
Fava and Pavan (1976) (26)	20 [IBS]	SI	70		
McDonald and Boucher (1980) (4)	32 [FBD]	CIS	53	20	
Latimer *et al*. (1981) (24)	16 [IBS]	SI	100		0
Wender and Kalm (1983) (25)	22 [IBS]	SADS	73		
Craig and Brown (1984) (7)	79 [FBD]	PSE	42	18	
Ford *et al*. (1987) (8)	48 [FBD]	PSE	42	6	8
Colgan *et al*. (1988) (5)	37 [FBD]	CIS	57	6	
Corney and Stanton (1990) (6)	48 [IBS]	CIS	48		
Blanchard *et al*. (1990) (10)	68 [IBS]	DIS	56	25	18
Toner *et al*. (1990) (9)	44 [IBS]	DIS	61		21
Walker *et al*. (1990) (27)	28 [IBS]	DIS	93	19	
Talley *et al*. (1993) (28)	32 [IBS]	SCID	50	30	25
North *et al*. (1996) (31)	10% males 19% females (n = 13,537) [FBD]	DIS	51 (males) 45 (females)		34 (males) 27 (females)
Talley *et al*. (present study)	151 [IBS]	DIS	29† 21‡		23

SI = structured interview; CIS = clinical interview schedule; DIS = diagnostic interview schedule; SCID = structured clinical interview for DSM-III-R; PSE = present state examination; FBD = functional bowel disorder; IBS = irritable bowel syndrome.

† Rome II; ‡ Manning criteria.

National Comorbidity Survey (38, 39). We did not measure lifetime psychiatric diagnoses, as this tends to underestimate the true prevalence of psychiatric comorbidity (because of recall bias) (40). On most sociodemographic indicators, the New Zealand population in our Dunedin cohort is very similar to mid-sized cities in the United States (17, 41). Our results, however, are limited to younger adults with IBS; it is conceivable that advancing age might be associated with greater psychiatric morbidity. Data from the Epidemiological Catchment Area from the United States showed a peak of depression incidence in 30 yr olds with a second peak in 50 yr olds, and prodromal symptoms were common (42). Further follow-up of the present cohort will determine whether an association has been overlooked.

The present study did not collect information on health care seeking for abdominal symptoms among the subjects with IBS. Other researchers have reported that although persons with IBS are more neurotic and anxious than controls without IBS (43, 44), this may be explained at least in part by psychological distress driving health care seeking (11, 12, 45, 46). Hence, it is not possible to ascertain whether higher rates of psychiatric disorder were present in consulters, as would be expected. However, the present results are important as they suggest that psychiatric disorders may not be a major cause of IBS.

In conclusion, psychiatric disorders are common in the community. However, no convincing link between IBS and psychiatric disorders were evident in this cohort community study of young adults in New Zealand. We conclude that the high rates of psychiatric disorders in IBS reported from referral centers probably reflects referral bias. Our results suggest that nonpsychiatric factors are more important in the pathogenesis of IBS.

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