

## IRRITABLE BOWEL SYNDROME, ANXIETY, DEPRESSION AND PERSONALITY CHARACTERISTICS

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### SUMMARY

**Background:** Numerous studies have suggested that 54%-100% of patients with IBS may have associated psychiatric illness and personality pathology. This transversal controlled study was realized in order to evaluate anxiety and depression levels, as well as the personality characteristics of patients with IBS and to compare the results obtained with patients with episodes of depression and healthy individuals.

**Subjects and methods:** The experimental group consisted of 30 IBS patients, while two control groups consisted of the same number of inpatients with episodes of depression and healthy individuals from the general population. There were equal number of men and women in the study sample and all subjects were aged between 25 to 65 years. Standard psychometric instruments employed included Hamilton anxiety scale, Zung depression scale, Hamilton depression scale, Minnesota Multiphasic Personality Inventory (MMPI), Eysenck Personality Inventory (EPI).

**Results:** The average Hamilton and Zung depression scores were significantly higher in patients with depressive episodes compared with the IBS patients, while the mentioned scores among them were also significantly higher compared with the healthy controls. There were no significant differences between IBS and the group with depressive episodes in the average Hamilton anxiety levels, EPI neuroticism and extraversion levels and MMPI neurotic scales levels (Hs, D, and Hy). The significant differences were observed comparing the IBS patients to healthy individuals.

**Conclusion:** The patients suffering from irritable bowel syndrome who asked for medical help (consulters) because of their intestinal symptoms, presented emotional problems such as depression and anxiety and expressed neurotic personality characteristics.

**Key words:** anxiety – depression - irritable bowel syndrome - personality characteristics

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### INTRODUCTION

Irritable Bowel Syndrome (IBS) is a functional disorder characterized by a set of gastrointestinal symptoms often associated with extradigestive symptoms with unknown organic basis. It is a prototypic functional bowel disorder in terms of its heterogeneous nature, multifactor pathogenesis and requirement for individualized diagnosis and treatment (Bennett et al. 1998). Estimated prevalence for the general population is 8% to 17%, while only half of these asked for medical attention, as a result of some psychological factors that may play an important role in determining health care-seeking behaviour (Creed 1999). Several clinical studies and reports from different researchers have shown that, among patients seeking medical attention for IBS, 70-90% may have psychiatric co-morbidity, most commonly mood disorders, anxiety disorders and somatization disorder and this co-occurrence has added to controversy about the validity of the IBS diagnosis (Fullwood & Drossman 1995, Longstreth 1998, Lydiard 2001). The nature of the

relationship between IBS and other functional bowel syndromes to psychiatric disorders remains uncertain. Psychiatric disturbance among persons with IBS might represent a reaction to the stress of chronic gastrointestinal illness, but this possibility seems to have been excluded by the findings of lesser rates of psychiatric illness among patients with inflammatory bowel disorder (Walker et al. 1995, Kurina et al. 2001). Alternatively, IBS might represent an association feature of various psychiatric syndromes. This has been suggested by a number of investigations and is supported by the findings of high rates of IBS among persons with anxiety disorders (Lydiard 1997, Blomhoff et al. 2001). It is also possible that the association between IBS and psychiatric disorders observed in clinical populations does not exist in the wider community. Several community studies comparing the psychological profiles of consulters, non-consulters, and controls free of symptoms from the same population, showed that the consulters with IBS had significantly higher anxiety and depression scores than either the non-consulters or the controls (Whitehead et al. 1988,

Jones & Lydeard 1992, Gomborone et al. 1993, Thompson et al. 1997). Despite the lack of consensus on what are the specific emotional variables in IBS, certain personality factors (emotional hypersensitivity, inadequate stress coping, high neuroticism, covert aggression and hostility) have been regarded as being of importance for the course of the disorder (Bennet et al. 1998, Talley et al. 1998). The clinical manifestations of such personality factors increase the level of stress, anxiety, conflicts and aggression in the individuals (Tannum & Malt 2001). A few previous papers have suggested that personality factors are more linked to the way patients deal with their disorder and not the severity or quality of the symptoms, as well as to the psychiatric disorders (Talley et al 1990, Herschbach et al. 1999). Thus, people with IBS who also have a psychiatric illness may be more likely to ask for treatment. Clarification of this relationship has important diagnostic and treatment implications and may be sought through community surveys, family studies or by studying a group of IBS patients without comorbid psychiatric disorder.

Inspired by numerous studies from the literature, as well as with a variety of methodology and contradictory dates and results, we developed our transversal controlled study with the aim of assessing anxiety and depression, as well as the personality characteristics among patients with IBS.

## **SUBJECTS AND METHODS**

Our study was realized at Psychiatry Clinic Nis, as well as at the Clinic for Gastroenterology and Hepatology of Clinic Centre Nis from 2004 to 2006. All the evaluated subjects were between the ages of 25 and 65. The experimental group consisted of 30 IBS patients, 15 men and the same number of women. All the patients from the experimental group exhibited bowel symptoms suggestive of IBS and were asking for treatment at the gastroenterology service (consulters or clinical population). After gastroenterology examination (history and physical examination, sigmoidoscopy, contrast barium enema or colonoscopy, laboratory studies) patients were diagnosed according to the Rome symptom-based diagnostic criteria for IBS (pain eases after defecation, stools loose when pain present and more frequent with pain, feeling of incomplete evacuation, mucus per rectum and frequent abdominal bloating) (Drossman 1999a). They were consecutively referred for psychiatric and psychosomatic examination and evaluation. Entry criteria were: diagnosed IBS by the gastroenterologist based on symptoms criteria and examinations, age 20-60, primary education minimum, the absence of serious psychical disorder (psychoses, dementia, mental retardation, substance abuse disorders, a history of seizures), the absence of gastrointestinal disorder of organic nature or coexisting medical

illnesses that were not considered well-controlled, no history of abuse of laxatives or antidiarrheal agents.

The first control group consisted of 30 inpatients (15 men and the same number of women), recently hospitalized during a two-year study period at Psychiatry Clinic Nis, diagnosed as suffering from a depressive episode-F32.1, F32.2 according to ICD X. The second control group consisted of 30 healthy individuals from the general population. We tried to make a homogenization of our sample and took care about the entry criteria, mentioned above, as well as about sociodemographic, age and gender matching.

All psychological assessments were focused on the areas of anxiety and depression at the moment of evaluation and personality characteristics. Standard psychometric instruments employed included Hamilton scale for anxiety, Hamilton depression scale, Zung depression scale, Minnesota Multiphasic Personality Inventory (MMPI) and Eysenc Personality Inventory (EPI). MMPI was scored on 3 validity scales (L, F, K) and 7 clinical scales (Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, Paranoid, Psychasthenia, Schizophrenia). EPI consisted of four scales, of which neuroticism, extraversion and lie scales were used. In this way we measured the personality characteristic-neuroticism which we hypothesised could be the key vulnerability factor in IBS. All examined individuals also responded to questionnaire items devised by the authors, focused on their socio-demographic characteristics.

The study was approved by the Regional Ethical Committee, all subjects gave written consent and the study was performed in full accordance with Declaration of Helsinki (1965) and later revisions. Within-and between-group comparison were performed using ANOVA. SPSS version 8.0 was used for all analysis.

## **RESULTS**

The average age among patients with IBS was 43.867, 47.267 among patients with depression episode and 41.633 among healthy individuals. Using ANOVA the statistically significant differences in the sociodemographic characteristics were not observed among the study groups with the exception of economic status. Most of the examined individuals were married, had finished secondary school, lived in towns, were employed and the differences were not statistically significant (Table 1). Economic status in 53.33% patients with IBS was medium, while the greatest number of patients with depressive episode, as well as healthy individuals had bad economic status. The differences were significant among all groups ( $F=5.86$ ,  $p=0.004$ ), with high significant difference between IBS group and the group of patients with depressive episode ( $t=3.74$ ,  $p=0.0004$ ).

**Table 1.** Sociodemographic characteristics of examined groups

	IBS		Depression episode		Healthy controls		Statistics
	N	%	N	%	N	%	
<b>Marital status</b>							
Married	22	73.33	21	70.00	24	80.00	F=0.82 p=0.44
Single	5	16.67	2	6.67	2	6.67	
Divorced	2	6.67	5	16.67	4	13.33	
Widow	1	3.33	2	6.67	0	0.00	
<b>Education</b>							
Primary school	3	10.00	7	23.33	6	20.00	F=2.30 p=0.11
Secondary school	15	50.00	18	60.00	14	46.67	
Higher school	4	13.33	2	6.67	4	13.33	
University	8	26.67	3	10.00	6	20.00	
<b>Place of living</b>							
Urban	23	76.67	25	83.33	27	90.00	F=0.20 p=0.82
Rural	7	23.33	5	16.67	3	10.00	
<b>Employed status</b>							
Employed	18	60.00	16	53.33	16	53.33	F=0.14 p=0.87
Un employed	8	26.67	9	30.00	10	33.33	
Pension	4	13.33	5	16.67	4	13.33	
<b>Economic status</b>							
Bed	5	16.66	17	56.67	12	40.00	F=5.860 p=0.004
Medium	16	53.33	11	36.67	9	30.00	
Good	9	30	2	6.67	9	30.00	
Average age	43.867 ±11.01		47.267 ± 9.314		41.633 ± 10.397		F=2.291 p=0.110

The average Hamilton depression score was 20.23 in the IBS group, 26.63 among patients with depressive episode, 7.63 among healthy individuals (Table 2). All patients suffering from depressive episode had Hamilton depression score over 15, while 83.33% of IBS patients and none among healthy individuals had such a high score. Kruskal-Wallis ANOVA showed high statistical differences among the study groups (Table 2) and using Mann-Whitney test the significant differences were reported between IBS and the group with depressive

episode ( $z=3.87$ ,  $p=0.000$ ), between IBS and healthy individuals ( $z=6.23$ ,  $p=0.000$ ), as well as between patients with depressive episode and healthy individuals ( $z=6.63$ ,  $p=0.000$ ). Highly significant differences among all examined groups were observed using Zung depression scale (Table 2). The score over 0.74, a score that is usually met among depressive patients that need hospitalization, was found in 13.33% of IBS patients and 43.33% of patients with depressive episode and none among healthy individuals.

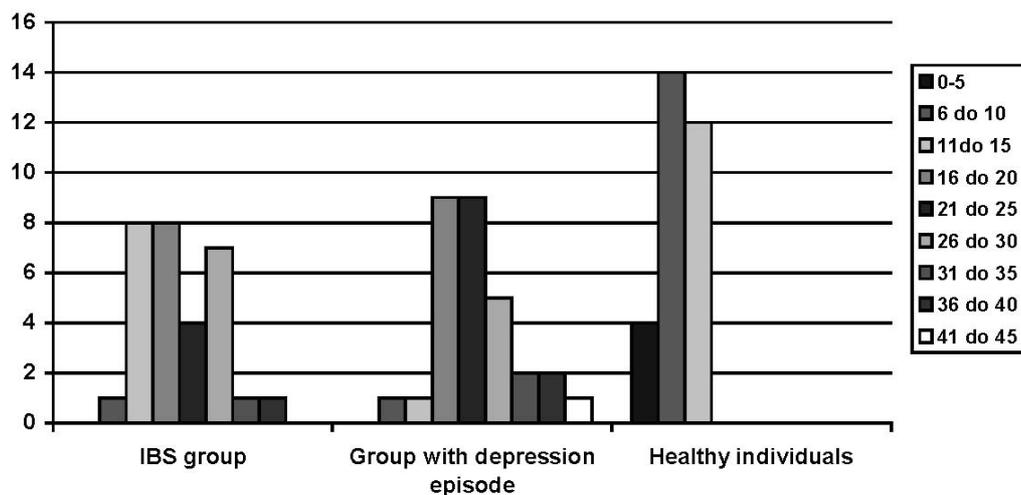
**Table 2.** The average scores for depression and anxiety among examined groups

Average score	IBS	Depression episode	Healthy controls	Statistics	
Hamilton depression scale	20.233± 5.71	26.633± 5.36	7.633± 4.0	H=62.73	p=0.00001
Zung depression scale	0.626± 0.102	0.72± 0.124	0.37± 0.068	H=61.98	p=0.00001
Hamilton anxiety scale	20.233±7.065	23.6±7.5	9.00±3.2	H=53.97	p=0.00001

The average Hamilton anxiety score in the IBS group was 20.23, 23.6 among patients with depressive episode and 9.0 among healthy individuals (Table 2). 23.3% patients had high anxiety scores ranging from 26 to 30, while such a range of scores occurred in 16.67% of patients suffering from a depressive episode and none among healthy individuals (Figure 1). Kruskal-Wallis ANOVA showed high statistical differences between the study groups (Table 2), while using Mann-Whitney test the significant differences were not reported between IBS and the group with depressive episode ( $z=1.86$ ,  $p=0.06$ ).

16.67% of IBS patients and 43.33% of patients with depressive episode showed a very high neuroticism

score on Eysenck Personality Inventory, while such a high score was not observed among healthy individuals. Most of the IBS patients, 53.33% and 70% of patients with depressive episode showed low extraversion scores, while such scores were observed in 26.67% healthy individuals. The average neuroticism and extraversion scores among the examined groups are shown in the table 3. Kruskal-Wallis ANOVA showed high statistical differences between the neuroticism scores and the extraversion scores among the study groups (Table 3). Using Mann-Whitney test the significant differences were not reported between the IBS group and the group with depressive episode regarding neuroticism ( $z=0.03$ ,  $p=0.98$ ), as well as extraversion ( $z=0.9$ ,  $p=0.37$ ).



**Figure 1.** Distribution of individuals with higher scores on all neurotic MMPI scales

**Table 3.** Personality characteristics among examined groups

Average score	IBS	Depression episode	Healthy individuals	Statistics
MMPI Hs	20.50±5.31	21.76±4.53	15.70±3.84	H=26.17 p=0.00001
MMPI D	24.50±5.90	26.83±4.34	15.20±5.96	H=33.90 p=0.00001
MMPI Hy	21.64±4.61	21.04±4.48	15.03±4.41	H=29.00 p=0.00001
Extraversion-EPI	9.37 ±5.334	8.1± 5.3	12.7± 3.6	H=12.02 p=0.00200
Neuroticism -EPI	18.3 ±3.71	18.4 ±3.51	12.633± 4.37	H=28.57 p=0.00001

The average scores for MMPI neurotic scales (Hs, D, Hy) are shown in Table 3. The differences were highly significant. 60% of the IBS patients and 63.33% of patients with depressive episode, had higher scores on all three MMPI neurotic scales (Hs, D, Hy), while only 10% of healthy individuals had such scores. Using Man-Whitney test significant differences between the IBS group and the group with depressive episode were not reported regarding MMPI Hs scale ( $z=0.97$ ,  $p=0.34$ ), MMPI D scale ( $z=1.04$ ,  $p=0.3$ ), and MMPI Hy scale ( $z=1.6$ ,  $p=0.11$ ).

## DISCUSSION

IBS is a chronic and recidivant disorder that affects all everyday contexts and gives rise to high social and health service costs and emotional problems among sufferers (Simren et al. 2001). High rates for psychiatric disorders among IBS patients have been reported: for depression - 46%, generalized anxiety disorder - 34%, panic disorder - 31%, somatization disorder - 26% (Farthing 1995). On the other hand, almost a half of patients with anxiety disorders and depression met criteria for IBS, where severities of both psychiatric and intestinal symptoms were closely correlated (Lydiard & Falsetti 1999).

Results of our study suggested that the majority of the IBS patients (83.33%), all patients with depressive episode and a minority (3.33%) among healthy

individuals showed very high levels of Hamilton depression score (over 15). Highly significant differences among all examined groups were observed using the Zung depression scale too. We have to point out that the individuals from our study ranged in their degree of depression. Hence, the score of over 0.74 (a score that is usually met among depressive patients that need hospitalization), occurred in 13.33% of IBS patients and 43.33% of patients with depressive episode and not at all among the healthy individuals. The explanation for this is the different depression severity among the hospitalized patients with depressive episode, as well as because of various reasons for hospitalization, such as family, social reasons, assessment of work ability, ect. These findings confirm what other studies of clinical IBS populations have found, and are at the upper end of the reported range (38-100%) for depression (Chaudhury & Truelove 1962, Whitehead et al. 1988, Masand et al. 1995, Drossman 1996).

The most commonly observed psychiatric disorders found in IBS patients, apart from major depression, are anxiety disorders (panic disorder, social phobia, generalized anxiety disorder) (Toleffson et al. 1991). Some evidence suggested that anxiety may be more prominent early in the course of IBS, whereas depression is more common in patients suffering from chronic IBS symptoms (Camilleri 2001). The results of our study showed that nearly one third of IBS patients had high anxiety scores ranging from 26 to 30, while

such a range of score occurred in 16.67% of patients suffering from a depressive episode and none among healthy individuals. There were no significant differences of anxiety levels between the IBS group and the group with depressive episode ( $z=1.86$ ,  $p=0.06$ ). These results are also consistent with older and more recent studies that have used diagnostic criteria and structured interviews (Young et al. 1976, Fullwood & Drossman 1995, Lydiard 2001).

The bulk of the published literature indicates that individuals asking for treatment for IBS-consulters have high levels of neurotic or other abnormal psychological traits, exhibit more illness behaviour, use ineffective coping styles, consume more health services, than individuals with IBS symptoms who do not seek medical treatment (Drossman et al. 1993, Longstreth 1998, Creed 1999, Tannum & Malt 2001). IBS was strongly associated with neuroticism and psychological morbidity. We proposed that neuroticism had predisposed to the developing and reporting of IBS symptoms (Totic-Golubovic et al. 2005a). Nevertheless, it has been suggested that the apparent link between psychological factors and IBS is explained by selection bias, as more psychologically disturbed persons tend to present for care (Gamborone et al. 1993, Gick & Thompson 1997). One third of IBS patients and almost two thirds of patients with depressive episode from our study showed high and very high neuroticism score on EPI. Over a half of IBS patients and 70% of the patients with depressive episode showed very low levels of extraversion. The mentioned differences in the levels of neuroticism and extraversion, comparing with the levels among healthy controls were highly significant ( $p=0.000$ ), while the significant differences were not reported between IBS and the group with depressive episode regarding neuroticism ( $z=0.03$ ,  $p=0.98$ ), as well as extraversion ( $z=0.9$ ,  $p=0.37$ ). Neuroticism is most likely a marker of vulnerability to IBS, and not merely a reflection of being chronic ill, or explained by sample bias secondary to illness behaviour (Totic-Golubovic et al. 2005b).

Although patients with IBS were psychologically more distressed than healthy subjects, had significantly higher scores on neurotic MMPI scales and showed lower ego strength, they do not have a common psychological profile (Drossman et al. 1999b). Most of IBS patients and patients with depressive episode from our study had higher scores on all three MMPI neurotic scales (Hs, D, Hy), while only 10% of healthy individuals had such scores. The significant differences between the IBS group and the group with depressive episode were not reported regarding MMPI neurotic scales (MMPI Hs scale ( $z=0.97$ ,  $p=0.34$ ), MMPI D scale ( $z=1.04$ ,  $p=0.3$ ), and MMPI Hy scale ( $z=1.6$ ,  $p=0.11$ )). It has been suggested that patients with these abnormal profiles frequently reported pain and other somatic complaints, particularly when under stress, tended to deny or minimize emotional concerns, displayed concern about health and bodily functions, and required

reassurance about their health. (Drossman et al. 1999b). However our findings should not imply that a distinct personality profile exists, but similar personality profiles were observed in our study among IBS patients from the population of consulters and patients with depressive episode.

A relationship between affective disorders and IBS is likely to be mediated by mechanisms that might operate via the locus ceruleus, though to be dysfunctional in anxiety and depressive disorder and by their well known links with gastrointestinal activity (Lydiard 1997). Neurotic personality characteristic and comorbid affective disorders may well determine whether non-consulters (individuals with IBS symptoms who do not seek medical treatment) become consulters (individuals seeking treatment for IBS), but the abnormal attitudes to illness also may be present in IBS consulters making them more likely to seek medical advice, even in the absence of affective disorder. Psychiatric illnesses such as mood, anxiety, and somatisation disorders share many common features with IBS, so it has been suggested that IBS is an epiphenomenon or form fruste of psychiatric disorder (a »psychosomatic« model). This view is compatible with the idea that symptoms like those of IBS are common in the general population and when amplified by psychiatric illness, reach the status of a disease (Gamborone et al. 1993). The association between bowel symptoms and psychological symptoms that is often seen in studies of medical clinic patients, such as our study, appears to be due to psychologically distressed patients selecting themselves for inclusion by going to physicians for treatment of bowel symptoms that other people ignore (Herchbach et al. 1999). Patients with abnormal psychological scores may amplify symptom reports and illness behaviour (Drossman et al. 1999b).

There are a number of study limitations: small sample size, self-selection of IBS subjects (we observed only consulters with IBS), reliability of the diagnosis of IBS. An epidemiological study, using a large community-acquired sample, may be the next logical step, and this would eliminate selection bias that may operate in a tertiary-care population. It would also determine whether an association between psychiatric disorders and IBS exists in the community. Further efforts are needed to validate the current diagnostic criteria for IBS, including follow-up studies and diagnostic boundary studies. To establish a causal path between psychiatric and psychological disturbances and IBS would require a prospective cohort study of thousands of individuals with a several decade long-follow up period. Our findings are based on a limited number of patients, which makes our data vulnerable to statistical biases and increases the threshold for obtaining statistical significance between groups. Data reaching statistical significance may therefore be viewed as highly indicative, though not conclusive.

## CONCLUSION

This study supports a relationship between psychiatric disorders and IBS, based on the increased levels of depression, anxiety and neurotic personality characteristic. The patients suffering from irritable bowel syndrome who ask for medical help (consulters) because of their intestinal symptoms, presented emotional problems such as depression and anxiety and expressed neurotic personality characteristics. It can be concluded that patients with IBS have premorbid personality characteristics that modulate the way that they perceive and become distressed by physiological causes, resulting in depression, anxiety symptoms and more health-care-seeking behaviour. In the complex treatment of IBS patients, involving psychiatrist is of great importance, especially if IBS is to be treated as a biological vulnerability. Such vulnerability can be worsened during distress requiring psychiatry treatment of a coexisting psychiatric disorder, maladaptive illness behaviour, as well as conducting a multimodal treatment strategy consisted of psycho and pharmacotherapy. Clinicians treating IBS should be aware of the continuing risk of mental illness and its complications, even when gastroenterological symptoms remit.

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