

Depression, Anxiety, Stress, Anger in IBS Patients

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(Received: 15 July 2012; accepted: 30 September 2012)

Irritable Bowel Syndrome (IBS) is one of the most common gastrointestinal (GI) disorders seen by primary care physician and gastroenterologist. Gender-specific prevalence rates for IBS are approximately two female to one male in most studies, and all population based. It is commonly accepted that IBS seems to be influenced by psychosocial stressors and affective factors, whose role may contribute to the predisposition, precipitation and perpetuation of IBS symptoms, affecting also the clinical outcome. Forty-five patients with irritable bowel syndrome (5males, 40 females) and 50 healthy volunteers from the community (7males, 43females) matched for age, level of education and social-status were enrolled. After an examination by a gastroenterologist and a total colonoscopy, all IBS subjects evaluated with clinical interview conducted by psychiatrist. All the subjects were administered the STAXI- 2 and DASS 21 tests. Participants included 45(47%) IBS patients (40% GAD, 24% depression, 18% OCD, 13% panic and 5% somatization disorder) with mean and standard deviation age of 38.44 (10.57) and 50 (53%) control with mean and standard deviation age of 35.42 (9.37). The results show significant differences in trait anger and Anger expression-out between IBS patients and the controls. From the present study it seems that IBS patients, compared with control subjects, were more psychologically distressed with higher degrees of depression, anxiety and anger. We suppose that psychological management are very important for reducing IBS symptoms, and it is clinically important to assess the psychological factors contributing to inducing IBS.

Key words: Depression, Anxiety, Stress, Anger, IBS patients.

Irritable bowel syndrome (IBS) is a common and chronic functional bowel disorder that is characterized by abdominal pain and/or discomfort accompanying with altered bowel habits in the absence of detectable structural abnormalities¹. The prevalence of IBS is about 10% to 15% in western² and 6% in Iranian general populations³. With considerable amount of visits

to primary-care physicians and also referrals to gastroenterologists, IBS imposes a substantial economic burden on both developed and developing countries⁴. The etiology of IBS is complex and still unclear, nevertheless, IBS may be viewed as resulting from the interactions of a number of factors, such as abnormal gastrointestinal motility, visceral hypersensitivity, and psychosocial factors.

A growing attention on the interaction between the central and enteric nervous systems has lead to the suggestion that the disease could be related to a hyperreactivity of the braingut axis, which is a model describing bidirectional pathways

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linking emotional and cognitive areas in the central nervous system with visceral afferent sensation and intestinal function .

It is commonly accepted that IBS seems to be influenced by psychosocial stressors and affective factors, whose role may contribute to the precipitation and perpetuation of IBS symptoms, affecting also the clinical outcome⁵. Subjects with IBS have showed a prevalence of psychiatric disorders at least 10% higher than controls⁶.

Negative affective and emotional states, such as anger, have been shown to be related to a decrease of antral motor activity in IBS patients, whereas in controls the same activity increased in anger-provoking situations⁷. Intestinal motility patterns may suffer emotional stimulation and, particularly, an exaggerated gastrocolic reflex, altered gastric emptying, increased small intestinal transit and small bowel contractions following stressful events have been documented in IBS patients⁸. The proposed rationale for this vulnerability is that IBS patients may have a lower threshold for coping with stressful events and negative emotions⁹; however, regarding defensiveness, IBS patients did not show significant differences in defensive profiles when compared to controls¹⁰.

Patients with IBS are more likely to report greater lifetime and daily stressful events than are those with organic disease or healthy controls and may be more susceptible to stress altering gastrointestinal function.

Anxiety and depression, rather than being a primary problem, might occur secondary to production of proinflammatory cytokines¹¹.

Studies indicate that anger as well as fear, pain, and anxiety increase colon motor activity in both IBS patients and normal subjects, although IBS patients respond to these emotions with higher motor activity^{12,13}.

Evans et al demonstrated a relationship between anger coping styles, abdominal pain, and postprandial dysmotility. These investigators observed increased postprandial dysmotility among IBS patients who had a higher sensitivity to abdominal pain and a greater tendency to suppress anger. While evidence suggests that colon motor activity in IBS patients may be part of a broader motor disturbance in other regions of the gut, the role of emotion in gastric antral motility

in this population remains unclear¹⁴.

The present study was designed to assess depression, anxiety, stress, anger, in a sample of IBS patients.

METHODS

Subjects

Healthy controls. Fifty healthy control subjects (43 women, 7 men) without evidence of acute or chronic illness were selected. In particular, there was no psychiatry history and no history of irritable bowel syndrome or abdominal symptoms on physical examination.

IBS patients

Forty -five IBS patients (40 women, 5 men) were selected and enrolled in the study. The diagnosis was established after a stool exam, clinical evaluation, and total colonoscopy by a gastroenterologist using ROME II criteria for IBS, then all subjects evaluated with clinical interview conducted by psychiatrist .The psychometric examination was conducted at the conclusion of the psychiatric interview. Although colonoscopy is not needed to make a diagnosis of IBS, it was performed to rule out other diseases of the gastrointestinal tract.

All subjects gave written consent prior to their participation in the assessment study which had been approved by the local ethics committee.

Instruments

All the patients were administered the following tests:

*State—Trait Anger Expression Inventory 2, (STAXI 2): The STAXI-2 was used to measure Trait Anger, State Anger, and Anger Expression. The STAXI-2 is a 57-item scale which uses 4-point Likert scales. The first part of the STAXI2 is the State Anger (SANG) scale. It consists of 15 items measuring individual experiences anger. The Likert scale for the State Anger scale ranges from 1 (not at all) to 4 (very much so).

Depression Anxiety Stress Scales (DASS-21)

The Depression, Anxiety, and Stress Scale (DASS) is a self-report scale that measures depression, anxiety, and stress. A short Persian version of the scale (Persian DASS-21) with seven items per subscale, was used. The Depression subscale measures dysphoria, hopelessness, devaluation of life, selfdeprecation, and lack of

interest/involvement, anhedonia, and inertia. The Anxiety subscale measures autonomic arousal, skeletal muscle effects, situational anxiety, and the subjective experience of anxiety. The stress subscale measures difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/overreactive, and impatient. In previous our study we reported the Cronbach alpha for Depression, Anxiety and Stress scales were 0.85, 0.85 and 0.87, respectively.

As mentioned before, each of the three scales of the DASS-21 has seven items taken from each of the three scales of the DASS-42. The items of the DASS-21 refer to the past week. Each item rated on a 4 point Likert scale from 0 which means "did not apply to me at all" to 3 "applied to me very much or most of the time". For each scale, the score can range from 0 to 21. The greater the score, the more severe the depression, anxiety and stress.

It has been argued that the DASS-21 has several advantages relative to the DASS-42, including fewer items, a cleaner factor structure and smaller interfactor correlations.

In previous our study, the DASS-21 demonstrated positive psychometric properties amongst the Iranian population. Results of the study indicate that the DASS-21 has overall good-to-excellent internal consistency, good stability over time, a three factor structure consistent with previous findings amongst mostly English speaking population, very good convergent validity and acceptable discriminant validity, especially with respect to the Depression scale. The DASS-21 psychometric strengths provide

support for its use in both clinical and research settings in the Iranian population (15).

RESULTS

Participants included 45(47%) IBS patients (40% GAD, 24% depression, 18% OCD, 13% panic and 5% somatization disorder) with mean and standard deviation age of 38.44 (10.57) and 50 (53%) control with mean and standard deviation age of 35.42 (9.37).

Regarding social and demographic features, no significant differences between IBS patients and healthy controls were documented (Table 1). These observations presumably indicate that social and demographic characteristics do not influence the comparison of the various levels of education between groups.

Tables 2 show the descriptive statistical analyses and the T-test for two independent samples based on the STAXI-2 and DASS 21 variables for IBS patients and controls.

Statistically significant differences between the two groups were found on Depression ($p=0.012$), Anxiety ($p=0.001$), Stress ($p=0.007$), T-ANG ($p=0.035$) and AX-I ($p=0.04$) scales.

SANG State Anger, TANG Trait Anger, AX-O Anger Expression-Out, AX-I Anger Expression-In, AC-O Anger Control-Out, AC-I Anger Control-In, AX Anger Expression index. Differently from previous reports, this study did not evaluate anger by experimental methods of induction, as it seems quite clear that ongoing emotional states such as anger and anxiety have a

Table 1. Socio demographic characteristics of the sample

Variables	IBS Group(n=45)	Normal Group(n=50) Mean(SD)	Total sample(n=95)	P value
Age	38.44 (10.57)	35.42 (9.37)	36.56 (10.32)	0.46
Gender	Count (%)	Count (%)	Count (%)	
Male	5 (%11)	7 (%14)	12 (%13)	0.78
Female	40 (%36)	43 (%86)	83 (%87)	
Marital status				
Never married	15 (%33)	10 (%20)	25 (%26)	0.49
Married	30 (%67)	40 (%80)	70 (%74)	
Education				
High School diploma	22 (%49)	20 (%40)	42 (%44)	0.65
Bachelor and Over	23 (%51)	30 (%60)	50 (%66)	

Sig* < 0.05

direct effect on gut motility. We chose a self-report questionnaire, the STAXI-2 that assesses both the experience of anger and its ways of expression.

The results show significant differences in trait anger and expression-in between IBS patients and the controls.

Table 2. DASS and STAXI-2 mean scores in IBS- patients and Normal- group

Variables	IBS- group		Normal- group		T - Test	
	Mean	SD	Mean	SD	T	P
Depression	9.22	4.94	6.66	4.79	2.56	0.012*
Anxiety	7.13	4.89	4.04	3.16	3.40	0.001*
Stress	10.02	5.02	7.32	4.51	2.76	0.007*
S-ANG	21.42	7.23	20.40	8.07	0.65	0.52
T-ANG	22.16	5.60	19.86	4.86	2.14	0.035*
AX-O	15.95	4.24	15.86	3.39	0.12	0.91
AX-I	20.19	3.83	16.87	3.87	2.77	0.04*
AC-O	20.28	5.09	20.18	5.13	0.10	0.92
AC-I	20.36	5.06	20.92	5.67	-0.50	0.62
AX	43.50	12.50	41.54	12.37	0.75	0.45

Sig* < 0.05

DISCUSSION

The present study was designed to assess depression, anxiety, anger, in a sample of IBS patients. Psychological assessment of the IBS patients, compared with normal subjects or other medical patients show a high prevalence of stress reports, abnormal personality features, psychiatric diagnoses and illness behavior.

The amygdala located in the CNS is known as an important structure active in the response to anxiety. This center activates the hypothalamic- pituitary-adrenal (HPA) axis and the autonomic system when patients find themselves in anxious situations. Chronic anxiety increases the activity of the amygdala leading to the formation of an HPA axis which will ultimately cause induced visceral hyperalgesia^{16,17}. Visceral hypersensitivity is considered to be one of the main factors that cause symptoms in IBS suffers and has been shown to play a key role in the pathophysiology of IBS¹⁸.

Our results indicate that IBS patients had more depressive and anxiety symptoms than control subjects. (40% GAD, 24% depression, 18% OCD, 13% panic).

These findings are almost similar to Lydiard study in IBS patients (46%depression, 34% GAD, 31% panic,) ¹⁹.

Regarding the emotion of anger assessed by the STAXI-2, IBS subjects scored higher than control subjects on the State Anger scale, Trait Anger scale and Anger out scale. These results are conflicting with those by the study from R. Zoccali *et al.*,¹⁰ who documented no significant differences in anger scales in IBS patients and the controls.

From the present study it seems that IBS patients, compared with control subjects, were more psychologically distressed with higher degrees of depression, anxiety and anger.

Women with IBS had higher anger ratings than healthy women that is similar to Lin Chang et al study²⁰.

There is increasing evidence to suggest that sex is an important factor in symptom patterns, physiological responses, and possibly treatment responses in IBS and two-thirds of individuals with IBS are women ²¹⁻²³.

Progress is being made in elucidating the mechanism by which psychological processes and IBS symptoms influence each other , for example patho-and psychophysiology establishes the link between psychological processes on the one hand and GI sensorimotor function and symptoms on the other, in patients with IBS, autonomic as well as psychoneuroendocrine and psychoneuroimmunological branches of the

brain-gut axis may be the mediators of this link.

The present study has several limitations. First, the sample size is fairly modest, and the results obtained should be replicated in larger samples. Second, there was recruitment of subjects from IBS patients referred from an endoscopy clinic. Therefore, they are likely to represent those with a more severe form of the disorder rather than a general population of IBS patients as seen in primary care.

We suppose that psychological management are very important for reducing IBS symptoms, and it is clinically important to assess the psychological factors contributing to inducing IBS.

Since anxiety and depression are the most prevalent psychologic conditions among patients affected by IBS, behavioral treatments may be considered in the IBS patients who have associated stress symptoms. Hypnosis, biofeedback and psychotherapy can help to alleviate anxiety levels in these patients.

ACKNOWLEDGMENTS

We would like to appreciate all the participants who gave their time to take part in our study.

REFERENCES

- Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional bowel disorders. *Gastroenterology* 2006; **130**(5): 1480-91.
- Saito YA, Schoenfeld P, Locke GR. The epidemiology of irritable bowel syndrome in North America: a systematic review. *Am J Gastroenterol* 2002; **97**(8): 1910-15.
- Solhpour A, Pourhoseingholi MA, Soltani F, Zarghi, A; Solhpour A, Habibi M, Zali M R. Gastro-oesophageal reflux disease and irritable bowel syndrome: a significant association in an Iranian population. *Eur J Gastroenterol Hepatol* 2008; **20**(8): 719-25.
- Roshandel D, Rezailashkajani M, Shafae S, Zali MR. A cost analysis of functional bowel disorders in Iran. *Int J Colorectal Dis* 2006; **22**(7): 791-9.
- Posserud, I., Ersryd, A., & Simre'n, M., Functional findings in irritable bowel syndrome. *World Journal of Gastroenterology*, 2006; **12**: 2830-2838
- Talley, N. J., Howell, S., & Poulton, R., The irritable bowel syndrome and psychiatric disorders in the community: Is there a link? *American Journal of Gastroenterology*, 2001; **96**: 1072-1079.
- Welgan, P., Meshkinpour, H., & Ma, L., Role of anger in antral motor activity in irritable bowel syndrome. *Digestive Diseases and Sciences*, 2000; **45**: 248-251.
- Bach, D. R., Erdmann, G., Schmidtman, M., & Monnikes, H., Emotional stress reactivity in irritable bowel syndrome. *European Journal of Gastroenterology and Hepatology*, 2006; **18**: 629-63
- Jones, M. P., Wessinger, S., & Crowell, M. D., Coping strategies and interpersonal support in patients with irritable bowel syndrome and inflammatory bowel disease. *Clinical Gastroenterology and Hepatology*, 2006; **4**: 474-481.
- Zoccali, R., Muscatello, M. R. A., Bruno, A., Barilla, G., Campolo, D., Meduri, M., et al., Anger and ego-defence mechanisms in non-psychiatric patients with irritable bowel syndrome. *Digestive and Liver Disease*, 2006; **38**: 195-201
- Talley NJ. Irritable bowel syndrome. In: Feldman M, Friedman LS, Brandt LJ, eds. *Sleisenger & Fordtran's Gastrointestinal and Liver Disease*. 9th ed. Philadelphia, Pa: Saunders Elsevier; 2010:chap 118.page: 2098.
- Welgan P, Meshkinpour H, Beeler M., Effect of anger on colon motor and myoelectric activity in irritable bowel syndrome. *Gastroenterology* 1988; **94**: 1150 -1156
- Welgan P, Meshkinpour H, Hoehler F., The effect of stress on colon motor and electrical activity in irritable bowel syndrome. *Psychosom Med* 1985; **47**: 139-149.
- Evans PR, Bennett EJ, Bak YT, Tennent CC, Kellow JE., Jejunal sensorimotor dysfunction in irritable bowel syndrome: Clinical and psychosocial features. *Gastroenterology* 1996; **110**(2): 393-404.
- Asghari A., Saed F., Dibajnia P. Psychometric properties of the Depression Anxiety Stress Scale-21 (DASS-21) in a non-clinical Iranian sample. *International Journal of psychology*. 2008; **2**: 82-102.
- Mayer EA, Naliboff BD, Chang L, Coutinho SV. V. Stress and irritable bowel syndrome. *Am J Physiol Gastrointest Liver Physiol* 2001; **280**: G519-24.
- Mayer EA, Naliboff BD, Chang L. Basic

- pathophysiologic mechanisms in irritable bowel syndrome. *Dig Dis* 2001; **19**: 212-8.
18. Naliboff BD, Munakata J, Fullerton S, Gracely RH, Kodner A, Harraf F, *et al.*, Evidence for two distinct perceptual alterations in irritable bowel syndrome. *Gut* 1997; **41**: 505-12.
 19. Lydiard RB, Falsetti SF. Experience with anxiety and depression treatment studies: implications for designing IBS clinical trials. *Am J Med* 1999; **107**: 658-738.
 20. Chang L, Mayer E A, Labus JS, Schmulson M, Young Lee O, Olivas TI, Stains J, Naliboff B D. Effect of sex on perception of rectosigmoid stimuli in irritable bowel syndrome. *Am j physiol Regul Integr com physiol.* 2006; **291**: 277-283.
 21. Chang L and Heitkemper MM. Gender differences in irritable bowel syndrome. *Gastroenterology* 2002; **123**: 1686-1701.
 22. Drossman DA, Camilleri M, Mayer EA, and Whitehead WE. AGA technical review on irritable bowel syndrome. *Gastroenterology* 2002; **123**: 2108-2131.
 23. Lee OY, Mayer EA, Schmulson M, Chang L, and Naliboff B. Genderrelated differences in IBS symptoms. *Am J Gastroenterol* 2001; **96**: 2184-2193.