**Evaluation of Anxiety in Patients with Irritable Bowel Syndrome**

İrritabl Barsak Sendromlu Hastalarda Anksiyete Değerlendirmesi

*Arzu Bilen1, Halil Özcan2, Ömer Topdağı1, Habib Bilen1*

**ABSTRACT**

**Aim/Background**: Irritable bowel syndrome (IBS) is a frequently encountered health problem in gastroenterology and primary care practice. The pathophysiology of IBS is still not fully elucidated. Psychogenic factors may play a significant role in the emergence and progression of the disease. Anxiety, a widespread psychiatric sign with many physical symptoms is the most crucial factor in psychogenic factors of IBS. The aim of this study was to investigate anxiety symptoms in patients with IBS in daily gastroenterology practice. **Method**: In our study, 100 patients diagnosed with IBS between 16-75 years of age who admitted to our internal medicine and gastroenterology outpatient clinics between April 2015 and June 2015 and 70 healthy individuals between the ages of 16-75 in the control group were included. Patients were diagnosed according to Rome III criteria. The State-Trait Anxiety Inventory (STAI) I and II were used. STAI-I was used to measure instant moods and STAI-II was used to measure perpetual anxiety of the study groups. **Results**: As a result of our study, anxiety scores were found to be significantly higher in patients with IBS than in the controls. **Conclusion:** We believe that our study is capable of raising awareness on the evaluation of anxiety in patients with IBS. With this awareness, the evaluation of anxiety symptoms and also the diagnosis of possible anxiety disorders in IBS patients may come to mind earlier. Early recognition and treatment of anxiety symptoms possibly associated with IBS will contribute to IBS treatment in daily gastroenterology practice.

**Key words:** Irritable bowel syndrome, anxiety, psychiatric disorders

**ÖZET**

**Amaç:** İrritabl barsak sendromu (IBS) gastroenteroloji ve birinci basamak uygulamalarında sıkça karşılaşılan bir sağlık sorunudur. IBS patofizyolojisi hala tam olarak açıklığa kavuşturulmamıştır. Psikojenik faktörler, hastalığın ortaya çıkmasında ve ilerlemesinde önemli bir rol oynayabilir. Birçok fiziksel belirtiye sahip ve yaygın bir psikiyatrik bozukluk olan anksiyete, IBS'in gelişimde önemli faktördür. Bu çalışmanın amacı günlük pratikte gastroenteroloji polikliniklerinde IBS’ li hastalarda anksiyete semptomlarını araştırmaktır. **Yöntem**: Çalışmamızda Nisan 2015 - Haziran 2015 tarihleri arasında iç hastalıkları ve gastroenteroloji polikliniğimize başvuran 16-75 yaş arası IBS tanısı alan 100 hasta ile 16-75 yaş arası 70 sağlıklı birey vardı. Roma III kriterlerine göre hastalar teşhis edildi. Durum Sürekli Kaygı Envanteri (STAI) I ve II kullanıldı. Çalışma gruplarının anlık duygu durumları ölçmek için STAI-I, sürekli kaygılarını ölçmek için ise STAI-II kullanılmıştır. **Bulgular:** Çalışmamız sonucunda IBS hastalarında kaygı puanları kontrol grubundan anlamlı derecede daha yüksek bulundu. **Sonuç:** Çalışmamızın IBS hastalarında anksiyete değerlendirmesi konusunda farkındalık yaratabildiğine inanıyoruz. Bu bilinçle, IBS hastalarında anksiyete belirtilerinin değerlendirilmesi ve olası anksiyete bozukluklarının tanısı daha erken akla gelebilir. Muhtemelen IBS ile ilişkili anksiyete belirtilerinin erken tanınması ve tedavisi günlük gastroenteroloji pratiğinde IBS tedavisine katkıda bulunacaktır.

**Anahtar kelimeler:** İrritabl barsak sendromu, anksiyete, psikiyatrik bozukluklar

**Received / Geliş tarihi:** 10.03.2019, **Accepted / Kabul tarihi:** 08.07.2019

1Atatürk Üniversitesi İç Hastalıkları Anabilim Dalı
2Atatürk Üniversitesi Psikiyatri Anabilim Dalı

\***Address for Correspondence / Yazışma Adresi:** Bilen H. Atatürk Üniversitesi Psikiyatri Anabilim Dalı, Yakutiye, ERZURUM - TÜRKİYE, E-mail: drbilen@atauni.edu.tr

Bilen A, Özcan H, Topdağı Ö, Bilen H. Evaluation of Anxiety in Patients with Irritable Bowel Syndrome. TJFMPC, 2019;13 (3): 350-355.

**DOI:**

**INTRODUCTION**

Irritable Bowel Syndrome (IBS) is next to the most common condition in the gastroenterology clinic.1 Prevalence rates of IBS are variable from country to country and changes between % 2.5 and % 19 in various studies conducted in our country.2 The diagnosis of IBS is mainly based on the presence of typical symptoms and the exclusion of organic diseases that may cause these symptoms. Rome III criteria are used to ensure the standardization of the diagnosis of IBS because of the presence of a wide range of symptoms, and exclusion of many organic diseases that may cause similar symptoms and the occasional change in the character of the complaints.3

It is believed that IBS occurs as a result of the complex interaction between many factors related to the intestinal and central nervous system. Factors like gastrointestinal motility changes, visceral hypersensitivity, fecal flora changes, bacterial overgrowth, food sensitivity, psychosocial dysfunction, and genetic predisposition are emphasized.4 Various IBS-stress animal models have been tried to demonstrate the relationship between stress and IBS and the possible mechanisms are examined in detail. These studies have shown that acute stress causes an increase in mucosal mast cells.5 Stress not only affects the intestinal system but also the central nervous system. Tyrosine kinase receptor up-regulation in nociceptive fibers, increased expression of c-fos and CRH in the spinal cord and brain parenchyma occurs under stress.6 Changes in the intestinal mucosa, spinal cord and brain parenchyma in stress models are closely associated with visceral hypersensitivity and hyperalgesia. There is a close relationship between changes in intestinal mucosa immune cells, central nervous system, peripheral nervous system, and gastrointestinal microbiota with prolonged stress exposure especially in the early stages of life.4

It is declared that IBS has strong comorbidity with psychiatric symptoms. Approximately 50% of IBS patients have a psychiatric disorder. However, there is no consensus that there is a direct relationship between any particular psychiatric disorder and the development of IBS.7 Psychiatric disorders contribute to the emergence of the disease with other factors that prepare the ground for IBS and they affect factors related to treatment and prognosis. According to the findings above, nowadays stress and stress-related psychiatric conditions such as anxiety, depression and, etc. are investigated.8 Anxiety, which is a common psychiatric sign, with many physical symptoms including gastrointestinal symptoms such as diarrhea, constipation, dyspepsia, bloating etc. which are also the complaints of patients with IBS is thought as the most prominent factor psychogenic factor of IBS.9 In the literature, there are inexplicit data about the relationship between IBS and anxiety disorders. However, the results of studies conducted to evaluate anxiety in patients with IBS in literature are contradictory.10,11

It is believed that most of the patients with IBS are referred to a specialist for physical symptoms and psychiatric symptoms are often neglected. In this study, we aimed to explore anxiety states of IBS patients with the STAI scales to show the high comorbidity of anxiety symptoms in IBS. We think that further studies evaluating the anxiety symptoms in IBS may lead to early diagnosis of psychiatric symptoms and increase the clinician's awareness on the treatment of these symptoms that may alleviate psychiatric and IBS symptoms at the same time.

**MATERIAL AND METHODS**

In our study, 100 patients diagnosed with IBS between 16-75 years of age who admitted to our internal medicine and gastroenterology outpatient clinics between April 2015 and June 2015, and 70 healthy individuals without any known disease or complaint between the same age group were included. The diagnosis of IBS was based on detailed patient anamnesis according to the Rome III criteria shown in Table 1.3 The participants who met the inclusion criteria were asked to join the study and Ataturk University Medical Faculty Ethics Committee approved the study (Session 1 and decision 4 of 19.02.2015). The State-Trait Anxiety Inventory (STAI); STAI-I was used to show patients' instant moods and STAI-II was used to show perpetual anxiety scales.12-15 The environment was provided to enable the patients to answer the questionnaire alone. The State-Trait Anxiety Inventory questionnaire was explained in detail to the patients, and the patients' written consent was obtained. As a result of the test, the scores obtained from both scales varied from 20 to 80. Low scores indicate a mild form of anxiety whereas high scores indicate a severe form of anxiety. Data analysis was done by using IBM SPSS 20.0 statistical package program (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.). Chi-square test, independent T-test, and Mann Whitney U tests were used for data analysis. Results were evaluated at a 95% confidence interval and p<0.05 significance level.

|  |
| --- |
| Table 1. Rome III diagnostic criteria for (IBS)Recurrent abdominal pain or discomfort at least 3 days/month in the last 3 months associated with two or more of the following:* - Improvement with defecation.
* - Onset associated with a change in frequency of the stool.
* - Onset associated with a change in form (appearance) of stool.
 |

**RESULTS**

Of the 100 patients included in the study, 29 were male, 71 were female. In the control group, 27 of the 70 people were male (38.6%) and 43 were female (61.4%). In the general study group, 56 of the 170 participants were male (32.9%) and 114 were female (67.1) (Table 2). There was a distribution in favor of women in the total participant, the patient and the control groups (p<0.05). The mean age of the patient group was 43.6 ± 13.6 and the mean age of the control group was 41.4 ± 16.5 (Table 3). There was no statistical difference between the mean age of the patients and the control group (p > 0.05)

|  |
| --- |
| **Table 2. Gender characteristics of patients** |
|  | Group | Total |
| Control | Patient |
| Gender | Male | Number | 27 | 29 | 56 |
| % Group | %38,6 | %29,0 | %32,9 |
| % Total | %15,9 | %17,1 | %32,9 |
| Female | Number | 43 | 71 | 114 |
| % Group | %61,4 | %71,0 | %67,1 |
| % Total | %25,3 | %41,8 | %67,1 |
|  Total | Number | 70 | 100 | 170 |
| %  | %41,2 | %58,8 | %100,0 |

|  |
| --- |
| **Table 3. Age characteristics of patients** |
|  | Number | Mean | Standard Deviation |
| Patient | 100 | 43.6 | 13.6 ± 1.4 |
| Control | 70 | 41.4 | 16.5 ± 1.9 |

Occupations of IBS patients participating in our study consisted of 1 security guard (1%), 57 housewives (57%), 5 retired (5%), traders (2%), 10 students (10%), 1 doctor (1%), 2 accountants (2%), 7 1 (1%), 9 workers (9%), 3 drivers (3%), 1 farmer (1%) and 1 aesthetician (1%). In the patient group occupational distribution as housewives, students, workers and civil servants were prominent. In control group occupations consisted of 1 security guard (1.4%), 22 housewives (31.4%), 4 retired (5.7%), 2 trades (2.9%), 15 students (21.4%), 2 nurses (2.9%), 11 doctors (15.7%), 5 teachers (7.1%), 1 accountant (1.4%), 1 civil engineer (1.4%), 3 civil servants (4.3%), 2 pharmacists (2.9%). In the control group occupational distribution, housewives, students and civil servants were prominent.

When the answers given to the surveys were examined; the results of the STAI-I questionnaire showing the anxiety of the patient group was 49.23 ± 9.5 points. The result of the STAI-II questionnaire, which is the second step of the anxiety assessment and showing permanent anxiety, were found to be 54.2 ± 9.2 points in the patient group. The result of the STAI-I questionnaire showing the anxiety of the control group was 45.7 ± 8.5 points. The result of the STAI-II questionnaire was found to be 39.4 ± 7.5 points. There was a statistically significant difference between the STAI-I and STAI-II scales scores in the patient group and control group (p < 0.0005). The statistically significant differences in STAI-I and STAI-II scores between the patient and control groups were not correlated with age and gender STAI-I and STAI-II scores of the patient and control groups are shown in figures 1 and 2.

**DISCUSSION**

In our study, there was a statistically significant association between IBS and anxiety symptoms. Similar to our study, compatible results were observed in a large meta-analysis series that reviewed the studies on the subject. Fond et al. evaluated the 764 publications that they found in a literature review about IBS and anxiety. As a result of various screening methods, 14 of these publications were included in their studies. In this meta-analysis, 885 IBS patients and 1384 controls were examined. In this meta-analysis, similar to the results of our study, a strong correlation was found between IBS and anxiety.15 After this and similar studies, if IBS does cause anxiety or anxiety leads to IBS arise; that’s the question. Some studies may give some clues about the answers to these questions. An interactive system called brain-bowel axis is mentioned.16 According to this view, gastrointestinal factors affect central nervous system functions. On the contrary, the central nervous system-related factors may also affect the gastrointestinal system functions. The presence of anxiety in IBS affects the treatment as well as its role in the etiopathogenesis. In addition, some drugs and behavioral approaches used in the treatment of IBS and anxiety show similarity. This may show a strong relationship between anxiety and IBS.17,18

In our study, anxiety scores were significantly higher in patients with IBS. In our study, 29% of the patients with IBS were male and 71% were female. This gender difference was also present in the control group and 38.6% of the control group was male while 61.4% was female. In epidemiological studies, the ratio of male to female is generally 1:2 in patients with IBS.19 It is thought that the prevalence of IBS in women may be related to ovarian functions. Some researchers report that IBS symptoms are exacerbated in premenstrual syndrome caused by estrogen reduction before the menstrual cycle.20 On the other hand, it is available in publications demonstrating that there is no relationship between estrogen levels and IBS symptoms.21 Also, it is a consistent finding that the prevalence of anxiety disorders in women is approximately twice as high as in men similar to the gender ratio in IBS.22

As seen in our study and the studies mentioned above, the emergence or existence of disorders especially anxiety symptoms in patients with IBS should be checked up. The main problem in daily practice in this regard is that the diagnosis of these psychiatric disorders is quite complex and that a psychiatric evaluation is needed for the diagnosis. Of course, the anxiety status scale we used in our study is insufficient for a definitive anxiety disorder diagnosis. However, it can be considered as a screening test which can be used in daily practice for patients with IBS, which is a common disease in gastroenterology outpatient clinics. The STAI-I and II scales used in our study are widely used to assess anxiety states in IBS and other diseases. STAI is a valid and reliable scale that it is performed by the patients themselves and can evaluate both permanent and transient anxious states and also evaluating STAI is relatively easy in clinical practice.

In our study, we investigated only anxiety states to evaluate their psychological status in patients with IBS.

As a conclusion, many studies have been reported evaluating psychiatric disorders in patients with IBS. However, better-designed studies are needed due to the existing methodological limitations in those studies, the difficulties in obtaining an adequate number of patients and the fact that some of the studies are not prospective. Our study was performed only with patients who were diagnosed with IBS in the internal medicine and gastroenterology outpatient clinic of our hospital. Although our results provide information about the anxiety states of IBS patients in our hospital, that may not be generalized to all patients. However, we believe our study is capable of raising awareness on the evaluation of anxiety in patients with IBS. With this awareness, the diagnosis of possible anxiety disorders in IBS patients will come to mind earlier. Early recognition and treatment of anxiety disorders in IBS may also contribute to IBS treatment and quality of life of the patients.

**REFERENCES**

1. Chey WD, Eswaran S, Kurlander J. Irritable Bowel Syndrome. JAMA. 2015; 313(9):982.
2. Unal UH. İrritabl Barsak Sendromu.Hakan Ümit ÜNAL Güncel gastroenteroloji. 2012; 16(3).
3. Saha L. Irritable bowel syndrome: pathogenesis, diagnosis, treatment, and evidence-based medicine. World J Gastroenterol. 2014 Jun 14; 20(22):6759-73.
4. Wald A. Pathophysiology of irritable bowel syndrome. https: // www.uptodate.com / contents / pathophysiology-of-irritable-bowel-syndrome, June 2019.
5. Barreau F, Salvador C, Houdeau, Bueno L, Fioramonti J. Long-term alterations of colonic nerve-mast cell interactions induced by neonatal maternal deprivation in rats. Gut 2008; 57: 582-590.
6. Bravo JA, Dinan TG, Cryan JF. Alterations in the central CRF system of two different rat models of comorbid depression and functional gastrointestinal disorders. Int J Neuropsychopharmacol 2011; 14: 666-683.
7. Hausteiner-Wiehle C, Henningsen P. Irritable bowel syndrome: relations with functional, mental, and somatoform disorders. World journal of gastroenterology: WJG 2014; 20:6024–6030.
8. O'Mahony SM, Clarke G, Dinan TG, Cryan JF. Irritable Bowel Syndrome and Stress-Related Psychiatric Co-morbidities: Focus on Early Life Stress. Handb Exp Pharmacol. 2017; 239:219-246.
9. Sugaya N, Nomura S, Shimada H. Relationship between cognitive factors and anxiety in individuals with irritable bowel syndrome. Int J Behav Med. 2012 Sep; 19(3):308-15.
10. Huerta I, Bonder A, López L, Ocampo MA, Schmulson M. Differences in the stress symptoms rating scale in Spanish between patients with irritable bowel syndrome (IBS) and healthy controls. Rev Gastroenterol Mex. 2002 Jul-Sep; 67(3):161-5.
11. Berman S, Suyenobu B, Naliboff BD, Bueller J, Sains J, Wong H et al. Evidence for alterations in central noradrenergic signaling in irritable bowel syndrome. Neuroimage. 2012 Dec; 63(4):1854-63.
12. Quek KF, Low WY, Razack AH, Loh CS, Chua CB. Reliability and validity of the Spielberger State-Trait Anxiety Inventory (STAI) among urological patients: A Malaysian study. Med J Malaysia. 2004; 59:258–67.
13. Balon R. Rating scales for anxiety/anxiety disorders. Curr Psychiatry Rep. 2007 Aug; 9(4):271-7.
14. Mondolo F, Jahanshahi M, Granà A, Biasutti E, Cacciatori E, Di Benedetto P. Evaluation of anxiety in Parkinson's disease with some commonly used rating scales. NeurolSci. 2007 Oct; 28(5):270-5.
15. Fond G, Loundou A, Hamdani N, Boukouaci W, Dargel A, Oliveira J et al. Anxiety and depression comorbidities in irritable bowel syndrome (IBS): a systematic review and meta-analysis. Eur Arch Psychiatry Clin Neurosci. 2014 Dec; 264(8):651-60.
16. Lee C, Doo E, Choi JM, Jang SH, Ryu HS, Lee JP et al. The Increased Level of Depression and Anxiety Irritable Bowel Syndrome Patients Compared with Healthy Controls: Systematic Review and Meta-analysis. J Neurogastroenterol Motil. 2017 Jul; 23(3): 349–362.
17. Friedrich M, Grady SE, Wall GC. Effects of antidepressants in patients with irritable bowel syndrome and comorbid depression. Clin Ther. 2010 Jul;32(7): 1221-33.
18. Jackson JL, O'Malley PG, Kroenke K. Antidepressants and cognitive-behavioral therapy for symptom syndromes. CNS Spectr. 2006 Mar;11(3): 212-22.
19. Heitkemper MM, Cain KC, Jarrett ME, Burr RL, Crowell MD, Woods NF et al. Relationship of bloating to other GI and menstrual symptoms in women with irritable bowel syndrome. Dig Dis Sci. 2004 Jan; 49(1):88-95.
20. Drossman DA, Chang L, Bellamy N, Gallo-Torres HE, Lembo A, Mearin F et al. Severity in irritable bowel syndrome: a Rome Foundation Working Team report. The American journal of gastroenterology 2011;106:1749–1759.
21. Heitkemper MM, Chang L. Do fluctuations in ovarian hormones affect gastrointestinal symptoms in women with irritable bowel syndrome? GendMed. 2009; 6 Suppl 2():152-67.
22. Borwin Bandelow, Sophie Michaelis, Epidemiology of anxiety disorders in the 21 st century. Dialogues Clin Neurosci. 2015 Sep; 17(3): 327–335.