

The early diagnosis of fibromyalgia in irritable bowel syndrome patients

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ABSTRACT

Irritable bowel syndrome (IBS) is a common disorder worldwide, but the diagnosis is often overlooked. This study aimed to evaluate the sociodemographic characteristics of IBS patients and the relationship between IBS and fibromyalgia. 202 patients with gastrointestinal system complaints who were admitted to Sisli Hamidiye Etfal Traininig and Research Hospital, Family Medicine Clinic were included in the study. $P < 0.05$ was considered statistically significant. Fibromyalgia was associated with IBS in 26.7% of the participants. There was a positive correlation between the incidence of fibromyalgia and use of medication due to IBS, change in stool frequency, generalized pain, frequent illness, headache, excessive stress cancer anxiety, workforce loss due to IBS symptoms and fibromyalgia ($p < 0.05$). The presence of generalized pain, among IBS symptoms, caused the most robust increase in the likelihood of fibromyalgia (80%). The symptoms which were increasing the possibility of fibromyalgia were mostly generalized pain, high WHOQOL total score, family history of cancer, and loss of workforce at admission. IBS is a condition that affects the daily life quality of individuals and is often a condition that can be confused or associated with other diseases. Primary care physicians should approach patients holistically, especially in patients with generalized pain, family history of cancer, loss of workforce at admission, and more careful about fibromyalgia in patients with high WHOQOL total score. This awareness will increase the chances of early diagnosis and treatment of patients and will provide less cost but more effective treatment.

Introduction

Irritable Bowel Syndrome (IBS) is a common non-life-threatening disease, but it deteriorates the quality of life and leads to severe economic losses. The chronic course of the disease is accompanied by changes in defecation habits, such as constipation and abdominal pain attacks due to spasm and hypermotility of the colon. Also, many different symptoms, such as motility disorder, visceral hypersensitivity, intestinal inflammation, post-infectious conditions, microflora change, bacterial overgrowth, and food sensitivity, may accompany these complaints [1,2].

In most patients, general complaints, such as weakness, exhaustion, fatigue, are common. Complaints such as getting out of bed like beaten, not wanting to get out of bed in the morning, not wanting to shave, not being able to prepare breakfast for the children who go to school in the morning decrease towards the evening, and the patient feels fit [2]. Complaints are often post-prandial in patients with IBS because of the

late-onset of gastrocolic reflex and longer than usual [2,3]. The etio-pathogenesis of the disease has not yet been fully elucidated. There is no biochemical or organic disorder in its etiology. Mostly, there is a pain in different frequencies, which is caused or increased by the stress or emotional state of the patients. It is reported that IBS is the most important disease, causing workforce loss after upper respiratory tract infections in the USA [1,3]. The prevalence of this disease in the community reaches up to 25% [1,3,4], and it is more common in women [5,6]. Although IBS is a disease of young people, it can be seen at any age. Its prevalence peaks in the 3rd and fourth decades [7]. The gold standard for the diagnosis of IBS and other functional gastrointestinal system complaints is to show that there are no other signs of disease by physical examination and routine tests in addition to history [8]. There are no laboratory tests and/or physical examination findings that can be used for the diagnosis IBS. After excluding the organic diseases, with the presence of ROME III criteria [9], the patients are diagnosed with IBS. However, IBS is a common disorder in our country

Abbreviations: IBS, irritable bowel syndrome; FM, fibromyalgia; WHOQOL, World Health Organization Quality of Life; Rome 1, improvement with defecation; Rome 2, onset associated with a change in stool frequency; Rome 3, onset associated with a change in stool form

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as well as in the world, but the diagnosis is often overlooked.

Fibromyalgia is a chronic disease characterized by generalized pain, joint tenderness, and systemic symptoms. Patients often complain of fatigue, inability to sleep, cognitive dysfunction, and depression [10,11]. The etiology and pathogenesis of the disease have not been explained. Diagnosis is difficult and usually overlooked because of the ambiguous and generalized nature of the symptoms. Pain, fatigue, and sleep disorders are symptoms that may raise the suspicion of fibromyalgia. Another issue that should be noted by the clinician is that although it does not seem associated with fibromyalgia, it is commonly present with cognitive disturbance, headache, hot and cold intolerance, restless legs, irritable bowel, and bladder syndrome [12-14].

Study design and participants

Two hundred two patients who were admitted to Sisli Hamidiye Etfal Training and Research Hospital Family Medicine Outpatient Clinic with gastrointestinal system complaints were included in the study.

The study included patients at least 18 years of age, with sufficient orientation and cooperation, and who agreed to participate in the study. Patients who were previously treated for fibromyalgia were excluded.

Sociodemographic characteristics, ROMA III criteria for the diagnosis of IBS [9] and 2010 ACR criteria for fibromyalgia [10] were evaluated. The patients were divided into two groups as those with and without fibromyalgia.

In order to evaluate the quality of life of the patients, the World Health Organization Quality of Life Index was used. The WHOQOL consists of 26 questions. There are four sub-groups: Physical, Psychological, Environmental, and Social. The scoring system was between 0 and 100, and higher values indicate a better quality of life [8,15,16].

All statistical analyses were performed using SPSS 22.0 software (IBM SPSS, Chicago, IL, USA). Descriptive data were given as numbers and percentages. Comparisons between the groups in terms of categorical variables were performed with Pearson's Chi-Square test and Fisher's Exact Test. Kolmogorov-Smirnov Test was used to confirm whether continuous variables were suitable for normal distribution or not. Differences between groups regarding continuous variables were compared with Student's t-Test, and mean values between multiple groups were compared with variance analysis. In order to analyze the usefulness of indicators for diagnosis of fibromyalgia, logistic regression (univariate and multivariate) and ROC analysis were performed. Results were evaluated in a 95% confidence interval, and $p < 0.05$ was considered significant.

This study was conducted with the approval of the ethics committee of Sisli Hamidiye Etfal Training and Research Hospital. (Confirmation code: 698)

The hypothesis

Can Primary care physicians detect fibromyalgia in patients with IBS? With simple questions early detection of fibromyalgia in patients with IBS can be done? This study aimed to evaluate the relationship between IBS and fibromyalgia.

Evaluation of the hypothesis

In 54 (26.7%) of the participants, IBS was accompanied by fibromyalgia, of which 44 (81.5%) were female, and 10 (18.5%) were male. No significant relationship was found between fibromyalgia and gender, marital status, education level, occupation, smoking-alcohol use, constipation, diarrhea, bloating, pain, and sleep disturbance ($p > 0.05$) (Table 1).

There was a positive correlation between the incidence of fibromyalgia and use of medication due to IBS ($p < 0.001$), change in

Table 1

Distribution of the patients according to their sociodemographic characteristics.

	With fibromyalgia (n = 54)	Without fibromyalgia (n = 148)	p
Gender (K/E)	44/10 (%81,5/ %18,5)	102/46 (%69/%31)	0,109
Mean Age	38,76 ± 11,34	38,47 ± 12,23	0,881
Smoking-alcohol use	28 (%42,5)	61 (%41,2)	0,296
Constipation	47(%87,6)	131 (%88,5)	0,807
Diarrhea	19 (%35,1)	39 (%26,3)	0,224
Bloating	48 (%88,8)	116 (%78,3)	0,106
Pain	16 (%29,6)	58 (%39,1)	0,250
Sleep disturbance	29 (%53,7)	59 (%39,8)	0,108
Use of medication	40 (%74)	58 (%39,1)	< 0,001
Change in stool frequency	16 (%29,6)	21 (%14,2)	0,010
Generalized pain	48 (%88,8)	42 (%28,3)	< 0,001
Headache	41 (%75,9)	73 (%49,3)	0,001
Cancer anxiety	15 (%27,7)	20 (%13,5)	0,022
Workforce loss	18 (%33,3)	19 (%12,8)	0,002

stool frequency ($p = 0.010$), generalized pain ($p < 0.001$), frequent illness ($p < 0.001$), headache ($p = 0.001$), excessive stress ($p = 0.038$) cancer anxiety ($p = 0.022$), workforce loss due to IBS symptoms ($p = 0.022$) and fibromyalgia. When the frequency of the reasons for admission was evaluated, the most common reason was constipation ($n = 159$, 78.7%). The least common reason for admission was diarrhea ($n = 32$, 15.8%) (Fig. 1).

Quality of life scores between the groups is shown in Table 2. Social and environmental scores are low in patients with fibromyalgia and this is statically significant. Physical and Psychological scores are low but they are not significant.

IBS likelihood of fibromyalgia in patients who were followed with IBS was evaluated with univariate model, and presence of family history of cancer, generalized pain, headache, the second Rome 3 criteria; "Change in the frequency of defecation", admission due to stress and loss of workforce, low social, environmental and total WHOQOL score increased the likelihood of fibromyalgia (Table 3). In the multivariate analysis, the factor with the highest predictive value was generalized pain. According to the multivariate reduced model, generalized pain, low WHOQOL total score, family history of cancer, and loss of workforce on admission could predict the probability of fibromyalgia at a rate of 87.2% (Table 4-Fig. 2).

Discussion

Irritable bowel syndrome (IBS) is a functional bowel disease characterized by abdominal pain and changes in bowel habits. The prevalence is between 10 and 15% worldwide. Patients suffer from a decrease in quality of life. Although various factors have been implicated in the etiology, its pathophysiology remains uncertain. There is no universally accepted treatment [17-19]. In recent years, low-grade inflammation and immune system dysfunction have been blamed [20]. In recent years, awareness has increased with the use of Rome criteria for diagnosis [5,6]; however, clinical experience does not increase at the same rate [21]. In our study, we also used the Rome 3 criteria, which is frequently used in the literature in recent years. One of the criterias; Change in the frequency of defecation appeared to be effective in univariate analysis with fibromyalgia. ($p:0,021$)

The incidence of IBS in women is slightly higher than in men. Furthermore, it is usually more common in the 3rd-4th decades [18,22]. In our study, women were more likely to have IBS. 146 (72.2%) of the patients included in the study were women. The frequency of female gender was higher in the group with fibromyalgia, but we could not find a relationship between fibromyalgia and IBS regarding gender.

Central nervous system disorders are seen in patients with IBS

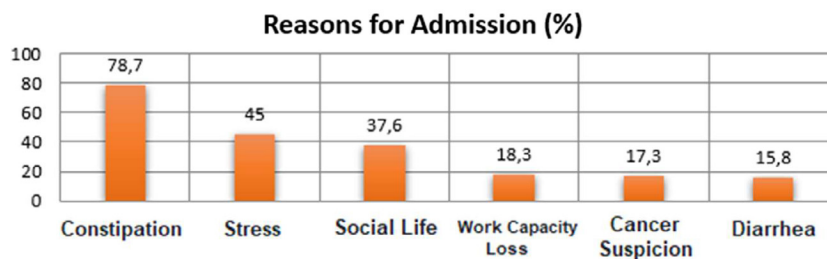


Fig. 1. Distribution of the reasons for admission.

Table 2
Subgroup scores according to the presence of fibromyalgia.

WHOQOL	With fibromyalgia	Without fibromyalgia	p
Physical	12,72 ± 2,01	12,99 ± 2,05	0,408
Psychological	13,48 ± 2,18	14,12 ± 2,50	0,100
Social	12,57 ± 3,34	14,04 ± 2,97	0,003
Environmental	12,53 ± 2,01	13,52 ± 2,38	0,007

increase stress and increase the severity of complaints [22]. Clinical studies show a clear link between stress and the presence and severity of symptoms [23]. Also, dysregulation in the central system helps explain the wide range of symptoms and the presence of the same symptoms as headache, back pain, fibromyalgia, sleep disorders, chronic fatigue syndrome, or anxiety-depressive disorders [24]. Extra-intestinal symptoms such as fatigue, anxiety, depression, and somatization further reduce the quality of life [25]. Somatization and neuroticism are usually seen in IBS patients. Psychological factors and even psychiatric diseases make the treatment challenging, quality of life worse, and change the adherence to treatment [23]. In a study in 2007, IBS was accompanied by many disease groups, and it was emphasized that while deciding for treatment, the accompanying situations should be considered as well [26].

Table 3
Univariate-Multivariate analysis for the diagnosis of fibromyalgia.

	Univariate Model			Multivariate reduced model		
	OR	95% GA	p	OR	95% GA	p
Age	1,002	0,98	-	1,03	0,880	
Gender	0,504	0,23	-	1,08	0,081	
Blood type	0,95	0,74	-	1,22	0,687	
Occupation	0,88	0,66	-	1,19	0,428	
Family history of cancer	2,37	1,09	-	5,16	0,029	2,70
Presence of daily activity	0,67	0,35	-	1,27	0,226	
Type of IBS	1,22	0,86	-	1,73	0,261	
Bloating	2,20	0,87	-	5,61	0,097	
Abdominal Pain	0,69	0,35	-	1,37	0,298	
Sleep disturbances	1,68	0,89	-	3,16	0,109	
Generalized pain	20,19	8,03	-	50,71	< 0,001	22,35
Headache	3,24	1,61	-	6,54	0,001	
Rome 1	2,47	0,87	-	6,95	0,087	
Rome 2	5,71	1,30	-	25,17	0,021	
Rome 3	2,31	0,93	-	5,67	0,069	
Constipation as reason for admission	1,771	0,66	-	4,77	0,257	
Diarrhea as reason for admission	1,882	0,69	-	5,11	0,215	
Stress as reason for admission	1,97	1,05	-	3,71	0,034	
Cancer anxiety as reason for admission	1,508	0,63	-	3,59	0,354	
Loss of workforce as reason for admission	3,39	1,61	-	7,13	0,001	3,20
Social life as reason for admission	1,191	0,57	-	2,50	0,644	
WHOQOL physical	0,93	0,80	-	1,09	0,406	
WHOQOL psychological	0,89	0,79	-	1,02	0,101	
WHOQOL social	0,86	0,77	-	0,95	0,004	
WHOQOL environmental	0,83	0,72	-	0,95	0,008	
WHOQOL total	0,96	0,94	-	0,99	0,007	0,962
						0,93
						-
						0,99
						0,021

Rome 1: Improvement with defecation Rome 2: Onset associated with a change in stool frequency Rome 3: Onset associated with a change in stool form Logistic Regression.

Table
4. Multivariate reduced model ROC analysis.

	AUC	% 95 confidence interval	
		Lower Bound	Upper Bound
Generalized pain	,803	0,736	0,869
Generalized pain and WHOQOL total	,855	0,804	0,907
Generalized pain – WHOQOL Total - Loss of workforce at admission	,867	0,818	0,917
Generalized pain – WHOQOL Total- Loss of workforce at admission – Family History of Cancer	,872	0,823	0,921

There are two types of fibromyalgia (FM); clinical FM and criteria based FM. Clinical FM shows the patients who were diagnosed with fibromyalgia clinically; on the other hand, criteria based FM is the type of FM that is used mostly for studies and is diagnosed according to the criteria in the literature, which allows us to see the more significant portion below the iceberg. Criteria based FM is more frequent, and many of these patients do not know that they have the disease [7,27].

In our study, we aimed to include patients with criteria based FM by excluding patients who were previously diagnosed with fibromyalgia.

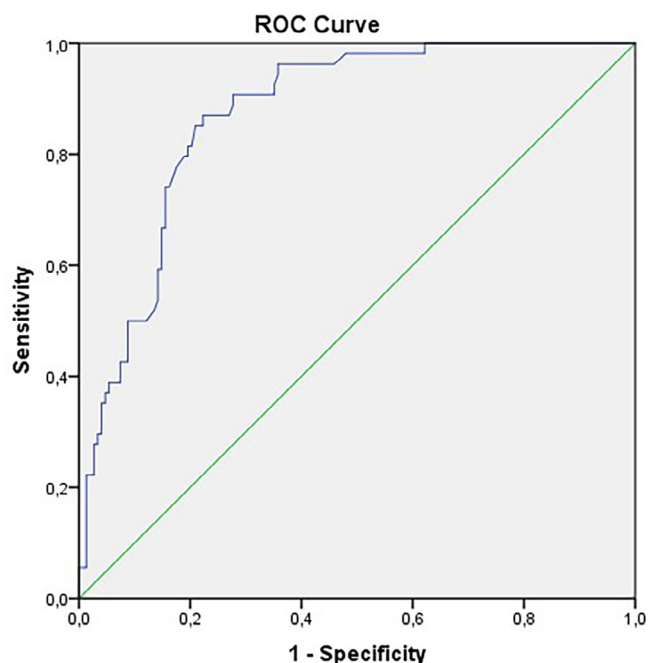


Fig. 2. The likelihood of the diagnosis of fibromyalgia with IBS symptoms (ROC analysis).

This way, we believe that patients with IBS could be treated for FM, which is one of the concomitant diseases; therefore, their quality of life would be increased.

In the survey conducted in IBS patients and healthy people, depression and anxiety scores were higher in IBS patients compared to healthy people. In this study, Camilleri emphasized that while deciding for the treatment, these points should be considered as well [28]. In our study, we found that stress was one of the factors that could help establish a relationship between IBS and FM in univariate analysis but was not effective in multivariate analysis. In order to evaluate the quality of life of the patients, we used the quality questionnaire published by the World Health Organization. In a study using this particular questionnaire, it was found that functional capacity and response to treatment were lower, and the complication rate increased in those who had low scores [29,30]. Furthermore, in a study conducted in Brazil in 2017, WHOQOL was found lower in patients with chronic diseases such as fibromyalgia [31].

In a study conducted in Ireland, there was a statistical difference between patients with and without IBS regarding WHOQOL and values were lower than in patients with IBS. According to the same study, there was no difference between IBS types [32]. In our study, no difference was found between IBS types as well. Furthermore, in the IBS patients also with fibromyalgia, this score was lower. In our model, we found that the likelihood of fibromyalgia accompanying IBS was increased in patients with lower scores.

In 2019, Türkoğlu et al. Emphasized that the WHOQOL scores varied among the subgroups of fibromyalgia and that this had an effect on determining treatment. According to this study, sleep disorders had an adverse effect on patients' treatment [33]. In our study, sleep disorder was more frequent in patients with fibromyalgia. Although there was not a statistically significant difference, we believe that it is one of the factors that make the difference in WHOQOL.

Conclusions

IBS is a condition that affects the daily quality of life of individuals and is often confused or associated with other diseases. Primary care physicians should evaluate these patients holistically and be more

careful about IBS and fibromyalgia, especially in women, particularly those with generalized pain, family history of cancer, loss of workforce in admission, and lower WHOQOL scores. This awareness will increase the chances of early diagnosis and treatment of patients and will provide less cost but more effective treatment.

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None.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.mehy.2020.110119>.

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