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Research Paper

The Association Between Depression and Activity of Inflammatory Bowel Disease

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ABSTRACT

Background: The association between depression and inflammatory bowel disease (IBD) has been reported worldwide.

Objectives: We aimed to investigate the prevalence of active and inactive IBD depression and its associated risk factors among patients with depression and IBD.

Materials & Methods: In this cross-sectional study, demographic data and clinical characteristics of 156 IBD patients referred to Razi Hospital, Rasht City, Iran, were recorded from 2015 to 2016. The Beck depression inventory (BDI) was administered to all patients, and their scores were classified as no, mild, moderate, and severe depression. Modified Truelove and Witts severity index (MTWSI) for ulcerative colitis (UC) and Harvey Bradshaw severity index (HBSI) for Crohn's disease (CD) were used to quantitate IBD activity as active UC (scored ≥10) and active CD (scored ≥7).

Results: About 35.9% of the patients (n=56) had depression. Patients with active IBD had significantly higher BDI scores than those with inactive IBD (14.41±10.34 vs 10.14±10.28, respectively, P=0.011). Except for income (P=0.001), no significant associations were detected between IBD status and other background variables (P>0.05). No patients in either active or inactive IBD groups had cancers. Based on the severity of depression, the patients were grouped as follows: 64.1% had no depression, 30.1% had mild depression, 5.8% had moderate depression, and 0.0% had severe depression. However, significant positive associations were seen between an increase in depression severity and having autoimmune diseases, a lower education level, and a history of IBD-related surgeries.

Conclusion: It seems that patients with active IBD are more depressed than inactive IBD patients.

Keywords: Depression, Colitis, Ulcerative, Crohn's disease, Education

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Highlights

- Depression increases the patient's susceptibility to recurrent active IBD.
- Depression is more frequent in patients with active IBD.
- By controlling the depression in patients with IBD, the frequency of active IBD can be reduced.

Introduction

Inflammatory bowel disease (IBD) involves a group of chronic diseases of the gastrointestinal tract which is recurrent and remitting; the term includes mainly Crohn's disease (CD) and ulcerative colitis (UC). The prevalence of UC and CD has expanded within the past decades, up to 120–200 per 100000 and 50–200 per 100000, respectively [1]. IBD exists in both active and remission (inactive) forms. Clinical and environmental factors contribute to the prognosis of recurrence in patients with IBD, including younger age at the time of diagnosis, female gender, intestinal involvement, history of smoking, and medication [2, 3].

Due to the disease chronicity that needs long-term coping and self-management, it is expected that patients with IBD are at higher risk for mental health problems such as depression [4]. Psychiatric dysfunction in patients with active IBD was reported to be significantly higher than in patients with inactive IBD, and the relationship between IBD and depression seems to be bidirectional [5, 6].

The suggested associated mechanisms between IBD and depression included increased pro-inflammatory cytokines, vagal nerve signaling, gut dysbiosis, and changes in neuronal, in which antidepressants and behavioral therapies have been reported ineffective on depression but alleviate IBD symptoms or its relapse [7]. One prior study showed that IBD patients experience depression three times that of the general population [8].

In IBD patients, depression is associated with a lower quality of life, sexual dysfunction, worsened disease activity, and increased frequency of flares [9, 10]. However, even IBD patients in clinical remission can have depression [11]. Therefore, we aimed to investigate whether depression is associated with active or inactive IBD and the related risk factors among patients with IBD.

Materials and Methods

Study design and patients

This cross-sectional study was conducted on 156 patients with IBD referred to Razi Hospital, Rasht City, Iran, during 2015-2016. They were divided into two active and inactive IBD groups diagnosed by a gastroenterologist and liver specialist in Gastroenterology and Hepatology ward based on the clinical, laboratory, endoscopic, and pathologic findings. The enrolled patients were informed about the study procedure, and their written consent was obtained.

Demographic data and clinical characteristics of participants included gender, familial history of IBD, marital status, income, education level, history of smoking, alcohol consumption, oral and dental hygiene, history of autoimmune disease, IBD-related surgeries, and medication. Also, the Beck Depression Inventory (BDI) was administered by a psychologist, and the obtained scores were classified as no (score 1-15), mild (score 16-31), moderate (score 32-47), and severe (score 48-63) depression. According to the study by Dadfar et al., BDI had good validity and reliability for research in Iran [12].

Activity status of IBD

Two valid tools of modified Truelove and Witts severity index (MTWSI) for UC [13] and Harvey Bradshaw severity index (HBSI) for CD [14] were used to quantitate IBD activity. Based on these scores, UC patients who scored ≥10 on the MTWSI and CD patients who scored ≥7 on the HBSI were classified as patients with active diseases. Activity indices were evaluated while filling out the questionnaire.

Statistical analysis

SPSS software, version 16 was used for descriptive and inferential statistical evaluation. The Chi-square test was used to evaluate the associations of demographic parameters with IBD status and depression. $P<0.05$ was considered a significant difference.

Table 1. Different demographic categories based on active or inactive status of IBD and depression level

Parameters		No. (%) IBD Status		P*	No. (%) Depression Status			P*
		Active	Inactive		No	Mild	Moderate	
Gender	Male	33(42.3)	42(53.8)	0.149	54(72.0)	18(24.0)	3(4.0)	0.136
	Female	45(57.7)	36(46.2)		46(56.8)	29(35.8)	6(7.4)	
Autoimmune disease	Yes	5(6.4)	3(3.8)	0.716	5(5.0)	1(2.1)	2(22.2)	0.043
	No	73(93.6)	75(96.2)		95(95.5)	46(97.9)	7(77.8)	
Familial history of IBD	Yes	6(7.7)	8(10.3)	0.575	9(9.0)	3(6.4)	2(22.2)	0.313
	No	72(92.3)	70(89.7)		91(91.0)	44(93.6)	7(77.8)	
Marital status	Single	69(88.5)	69(88.5)	0.977	29(29.0)	16(34.0)	3(33.3)	0.814
	Married	9(11.5)	9(11.5)		71(71.0)	31(66.0)	6(66.7)	
Education level	Low	19(24.4)	17(21.8)	0.902	16(16.0)	15(31.9)	5(55.6)	0.031
	Medium	39(50.0)	39(50.0)		56(56.0)	20(42.6)	2(22.2)	
	High	20(25.6)	22(28.2)		28(28.0)	12(25.5)	2(22.2)	
Income	Income	6(7.7)	10(12.8)	0.001	9(56.3)	4(25.0)	3(18.8)	0.111
	Low	62(79.5)	41(52.6)		68(66.0)	30(29.1)	5(4.9)	
	Mid-low	5(6.4)	23(29.5)		16(57.1)	12(42.9)	0(0)	
	Mid-high	5(6.4)	4(5.1)		7(77.8)	1(11.1)	1(11.1)	
	High	6(7.7)	10(12.8)		9(56.3)	4(25.0)	3(18.8)	
Smoking	No	69(88.5)	69(88.5)	0.675	88(88.0)	42(89.4)	8(88.9)	0.002
	Ever	7(9.0)	5(6.4)		10(10.0)	2(4.3)	0(0)	
	Active	0(0)	1(1.3)		0(0)	0(0)	1(11.1)	
	Ex-smoker	2(2.6)	3(3.8)		2(2.0)	3(6.4)	0(0)	
Alcohol consumption	Yes	8(10.3)	9(11.5)	0.797	11(11.0	6(12.8)	0(0)	0.530
	No	70(89.7)	69(88.5)		89(89.0)	41(87.2)	9(100)	
Oral and dental hygiene	Low	15(19.2)	14(18.0)	0.944	18(18.0)	9(19.1)	2(22.3)	0.958
	Medium	33(42.3)	32(41.0)		40(40.0)	21(44.7)	4(44.4)	
	High	30(38.5)	32(41.0)		42(42.0)	17(36.2)	3(33.3)	
IBD-related surgeries	Yes	7(9.0)	9(11.5)	0.598	10(10.0)	3(6.4)	3(33.3)	0.050
	No	71(91.0)	69(88.5)		90(90.0)	44(93.6)	66(66.7)	
History of drug consumption	Yes	44(56.4)	50(64.1)	0.326	59(59.0)	29(61.7)	6(66.7)	0.877
	No	34(43.6)	28(35.9)		41(41.0)	18(38.3)	3(33.3)	

*The Chi-square test.

Results

Data from 78 patients in the active IBD group and 86 patients in the inactive IBD group were analyzed. Based on the results, the Mean±SD age of patients in active and inactive IBD groups were 38.50±14.73 and 39.11±14.29 years, respectively (P=0.791). Their Mean±SD BMI values were 25.95±18.94 and 24.79±4.13 kg/m^2, respectively (P=0.598). Females had more active IBD and depression than males, but the differences were not significant (P>0.05). No statistically significant association was reported between the familial history of IBD, marital status, alcohol consumption, oral and dental hygiene, and history of drug consumption and IBD and depression among patients (P>0.05). The prevalence rates of no, mild, and moderate depression among patients were significantly different in terms of autoimmune disease, educational level, history of smoking, and IBD-related surgeries, while only income was reported to be different among active and inactive IBD groups (P<0.05) (Table 1).

According to Table 2, the logistic regression showed that among patients with depression, the prevalence of active IBD (60.7%) was higher than that of inactive IBD (39.3%) (odds ration [OR]: 2.01; 95% CI: 1.03-3.89).

Discussion

It has been reported that depression is prevalent in IBD patients, and baseline depression is related to a higher risk for aggressive IBD at follow-up [15]. In this study, we investigated the role of depression in IBD flare among patients with both depression and IBD.

The reported frequency of depression in IBD patients was nearly 36%, which was higher than reported in a systematic review, illustrating that depression was as high as 21.2% in patients with IBD vs 13.4% in healthy controls. It has been reported that in patients with active IBD, the rate of depression is 34.7%, with no significant differences between CD and UC [16].

A study by Al-Aamri et al. reported that among patients with IBD, female gender and younger age had significant associations with higher depression. The prevalence of reported depressive symptoms was 23.4% in females [17]. In this study, while females were more frequent in the active IBD group, gender showed no statistically significant association between active and inactive IBD and depression status in patients. Also, various studies reported the association between gender and age with the risk of depression among patients with IBD [18–20].

Our results revealed that among patients with IBD, the comorbidity of depression predisposes patients to a higher prevalence of active IBD than patients without depression. Similar to our results, depression was reported to be more frequent among patients with active IBD [19]. One of the possible mechanisms for this positive association between depression level and IBD activity can be the lower medication adherence in depressed patients, which affects the IBD status. Although, IBD patients are at the same risk for psychological disorders as the general population [21]

Based on our results, a higher frequency of depression among patients with an autoimmune disease that received immunosuppressive drugs was obtained. Corticosteroids, as one of the main used drug groups in IBD patients, can affect mood status. On the other hand, depression, through a decrease in medication adherence, can affect chronic disease activity [22]. Despite drug-related effects, it has been confirmed that psychological problems such as stress have some associations with IBD status through changes in the hypothalamic-pituitary-adrenal axis, bacterial-mucosal interactions, and cellular and molecular pathways [23, 24].

Gao et al. reported no association between smoking status and the prevalence of IBD among patients with depression [25]. Our results illustrated that the majority of patients did not smoke and also had a higher prevalence of mild depression. Due to the higher severity of depression in patients with active IBD, diagnosis, and

Table 2. The Association between depression and IBD status

Depression status	IBD Status		OR (95 % CI)	P
	No. (%)			
	Inactive	Active		
No	57(56.4)	44(43.4)	Ref	0.041
Yes	22(39.3)	34(60. 7)	2.01(1.03-3.89)	

treatment of depression in IBD patients are highly suggested, which can improve the patient's quality of life.

Conclusion

According to our results, depression increases the patient's susceptibility to recurrent active IBD. In this regard, by controlling depression in patients with IBD, the cycle of active IBD can be reduced.

Ethical Considerations

Compliance with ethical guidelines

All study procedures followed the ethical guidelines of the Declaration of Helsinki 2013. The study was approved by the Ethics Committee of Guilan University of Medical Sciences, Rasht, Iran (Ethical Code: IR.GUMS.REC. 1394.196).

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Authors contributions

Conceptualization: Farahnaz Joukar, Mehrnaz Asgharnezhad, and Amineh Hojati; Methodology: Sara Maveddati and Masood Sepehrimanesh; Investigation: Adeleh Isanazar and Alireza Mansour-Ghanaei; Writing the original draft: All authors; Writing, review, and editing: Niloofar Faraji and Tahereh Zeinali; Resources: Alireza Samadi and Fariborz Mansour-Ghanaei; Supervision: Farahnaz Joukar and Fariborz Mansour-Ghanaei.

Conflict of interest

The authors declared no conflict of interest.

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