

The relation between anxiety and functional constipation: A multicenter study in Iranian medical interns

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Abstract

Background: Functional constipation and its-related predisposing factors are so frequent among medical staff.

The aim of study: To determine the prevalence of functional constipation and its relation to psychological disorders among Iranian medical interns.

Methods: This multicenter, cross-sectional study was performed on 369 medical interns working at 5 main educational hospitals affiliated by universities of medical sciences in Iran during 2016–2017. The questionnaires related to the ROME criteria definitive for functional constipation were raised to confirm or reject definitive diagnosis of disease. To assess depression, anxiety and stress status of the participants, it was used the Persian version of the DASS-21 questionnaire that was previously validated by the Iranian researchers.

Results: Overall, the prevalence of functional constipation in medical interns was 26.3%; and was more frequent in female gender ($p=0.043$). It was not related to depression in cases ($p=0.1$) or baseline parameters (marital status, body mass index, severity of depression, or degree of stress status). But was related to severity of anxiety ($p=0.004$) and irregular eating breakfast ($p=0.041$); deliberately ignoring defecation ($p=0.010$).

Conclusion: It can be concluded high prevalence of functional constipation in medical interns especially in female gender, cases with low rate of eating breakfast, and deliberately ignoring defecation all might indicate the major role for anxiety in functional constipation in Iranian medical interns. Thus, the psychological consults programs for modifying the anxiety in cases with functional constipation might be helpful.

Introduction

Chronic constipation is a common global problem affecting different components of quality of life [1]. Although many disorders can reduce patients' survival, constipation generally reduces the level of patients' quality of life [2]. In prolonged situations, chronic constipation may lead to some annoying complications such as anal fissure, rectal ulcers, colon volvulus, as well as increased risk for colon polyps and even carcinoma [3,4]. The overall prevalence of chronic constipation ranged widely from 2% to 30% in general population [5]. Interestingly, constipation generally involves different physical, mental, social, and even economic aspects in every age subgroups and thus can confound productivity and the presence of people in the workplace, family, social environments and daily activities. The individuals affected by chronic constipation may lose their employment conditions (about 2.4 days per month) because of deterioration of disease symptoms. In a population-based survey in Canada, those who suffering functional constipation had low quality of life level as compared to control groups [2]. In another study, the productivity of people affected by functional constipation decreased by 30%. Also, the efficiency was reduced by at least 21% in 60% of the cases [6]. In total, chronic constipation is mainly diagnosed based on the ROME III criteria [7]. In this regard, the definitive criteria of chronic constipation include the existence of two or more of the following symptoms for the last three months with symptom onset at least six months prior to diagnosis: a. Straining

during at least 25% of defecations b. Lumpy or hard stools in at least 25% of defecations c. Sensation of incomplete evacuation for at least 25% of defecations d. Sensation of anorectal obstruction/blockage for at least 25% of defecations e. Manual maneuvers to facilitate at least 25% of defecations (e.g., digital evacuation, support of the pelvic floor) f. Fewer than three defecations per week [7]. The main etiologies for constipation can stratified as the primary and secondary. In primary or functional constipation, there is no physiological disturbance such as pelvic disorders or bowel obstruction, but some habits such as lifestyle, low intake of dietary fiber, lack of physical activity, or psychological problems may predispose the subjects to constipation [8–10]. In this regard, the critical role of some conditions including deliberative suppression of defecation, undesirable work shifts, or stressful occupational status may increase the likelihood and severity of functional constipation [11–14]. Because most of these predisposing factors are frequently observed among medical staff especially medical interns and students, we aimed to determine the prevalence of

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functional constipation and also to assess main determinants of this phenomenon among Iranian medical interns.

Materials and methods

This cross-sectional survey was performed on medical interns working at educational hospitals of five great universities of medical sciences in Iran in 2016. At baseline, the study questionnaire was distributed among medical interns with the initial consent of the participating in the study. The pointed questionnaire consisted of two general and specific parts. In general section, the baseline characteristics including gender, age, anthropometric indices, and marital status were collected and second section was specified to assessing the underlying disorders, habits or medications that might predispose them to occurring constipation. Because of targeted population included those interns suffering functional constipation, those with underlying factors should be excluded from the study. In next step, the questionnaires related to the ROME criteria definitive for functional constipation were raised to confirm or reject definitive diagnosis of disease. The validation of the Rome III diagnostic questionnaire for the adult functional constipation was done by Toghiani *et al.* yielding high reliability with the odd questions' values of Cronbach's alpha of 0.77 [15]. To assess depression, anxiety and stress status of the participants, it was used the Persian version of the DASS-21 questionnaire that was previously validated by the Iranian researchers [16,17]. In addition, some underlying factors and habits that might be correlated with appearance of functional constipation such as deliberately ignoring defecation, lack of regular eating breakfast, and gender were assessed as the probable determinants for constipation. Initially, participants were given an explanation of the purposes and the stages of the study and then they were asked to fulfill the questionnaire in ultimate relaxing and without the help of others. Finally, the relationship between each of the study parameters and presence of functional constipation was assessed using the statistical tools. In this regard, results were presented as mean \pm standard deviation (SD) for quantitative variables and were summarized by absolute frequencies and percentages for categorical variables. Normality of data was analyzed using the Kolmogorov-Smirnoff test. Categorical variables were compared using chi-square test or Fisher's exact test when more than 20% of cells with expected count of less than 5 were observed. Quantitative variables were also compared with t test or Mann U test. For the statistical analysis, the statistical software SPSS version 16.0 for windows (SPSS Inc., Chicago, IL) was used. P values of 0.05 or less were considered statistically significant.

Results

Of 385 individuals initially entered into the study, 16 were excluded because of underlying disorders or using some drugs influencing final study endpoints and thus 369 cases were finally analyzed. The mean total body mass index was 22.83 ± 3.64 kg/m² ranged 15.10 to 36.93. Totally, 60.2% were male and 39.8% were female. Regarding medical universities, 43.4% educated in Tehran University, 18.4% in Tabriz University, 24.9% in Iran University, 7.3% in Gorgan University and 6.0% in Kermanshah University. Overall, the prevalence of functional constipation in medical interns was 26.3%. As shown in Table 1, the presence of functional constipation did not depend on baseline parameters (including marital status, body mass index, severity of depression, or degree of stress status). However, as shown in Tables 1: Functional constipation was more prevalent in female than in male interns ($p=0.043$). Those who suffered constipation had lower rate of regular eating breakfast as compared to other interns ($p=0.041$). Also, deliberately ignoring

defecation was found significantly more in those who complained from functional constipation ($p=0.010$).

Moreover, the severity of anxiety was considerably higher in those suffering constipation ($p=0.004$). But depression has not related to functional constipation ($p=0.1$) (Table 2).

Discussion

Our study revealed functional constipation in 26.3% of Iranian medical interns, while this rate in a systematic review conducted on similar population in the United States was found to be 15.0% [18]. In another study on Iranian population regardless of educational level or occupation, the prevalence of functional constipation was estimated 2.4% to 11.2%. The rate of functional constipation on Chinese and Spanish similar samples was 6% and 28.8% [19] indicating a wide prevalence range in the world. This discrepancy might be due to the difference in definitive criteria of functional constipation or the difference in cultural or social conditions. Partial lower rate of functional constipation in Iranian population may be due to the use of Iranian toilet leading better rectal defecation [20]. Also, higher

Table 1. Study characteristics in medical interns with and without constipation

Factor	Constipation (+)	Constipation (-)	P value
Female gender	47 (48.5)	100 (36.8)	0.043
Married status	8 (8.2)	14 (5.1)	0.268
Body mass index			0.395
Normal	73 (75.3)	207 (76.4)	
Overweight	22 (22.7)	51 (18.8)	
Obese	2 (2.1)	13 (4.8)	
Rate of eating breakfast/week			0.041
None	27 (27.8)	54 (19.8)	
1 to 2 days	22 (22.7)	55 (20.2)	
3 to 4 days	27 (27.8)	62 (22.8)	
5 to 6 days	19 (19.6)	76 (27.9)	
Every day	2 (2.1)	25 (9.2)	
Deliberately ignoring defecation			0.004
No/seldom	46 (47.4)	166 (61.0)	
Sometimes	40 (41.3)	91 (33.5)	
Frequently	11 (11.3)	11 (4.0)	
Always	0 (0.0)	4 (1.5)	

Table 2. Psychological disorders in medical interns with and without constipation

Factor	Constipation (+)	Constipation (-)	P value
Depression			0.100
None	43 (44.3)	152 (55.9)	
Mild	22 (22.7)	38 (14.0)	
Moderate	22 (22.7)	52 (19.1)	
Severe	8 (8.2)	16 (5.9)	
Very severe	2 (2.1)	14 (5.1)	
Anxiety			0.004
None	36 (37.1)	151 (55.5)	
Mild	11 (11.3)	33 (12.1)	
Moderate	31 (32.0)	56 (20.6)	
Severe	17 (17.5)	22 (8.1)	
Very severe	2 (2.1)	10 (3.7)	
Stress grade			0.291
None	46 (47.4)	148 (54.4)	
Mild	25 (25.8)	60 (22.1)	
Moderate	21 (21.6)	41 (15.1)	
Severe	5 (5.2)	18 (6.6)	
Very severe	0 (0.0)	5 (1.8)	

consumption of dietary fibers and rice as an Iranian special regimen is another reason these claim [21]. Additionally, higher prevalence of functional constipation among medical interns as compared to general population may be due to failure to pass the stool at workplace for a long time, lack of regular sleeping, inadequate dietary regimen in hospitals, and low consumption of fruits, vegetables, and liquids due to high workload. As shown well in our survey, a significant association was revealed between the presence of constipation and deliberately ignoring defecation as a common behavior among interns. Such causality has been previously shown among nurses [22]. To prove this finding, a similar study on Brazilian medical students, the prevalence of functional constipation was about 35% [23]. In another study by Lin *et al.* in Malaysian, functional constipation was found in 16.2% of medical students [24].

As similarly shown in our study, most of previous studies could found higher rate of functional constipation in female than in male medical students that can be related to inhibitory effects of estrogenic hormones on B smooth muscle cells [25,26].

In our study, anxious individuals suffered more from constipation that was consistent with previous reports. This causality can be related to autonomic nervous system defects more seen in healthcare workers, however this association was not observed between constipation and other psychological abnormalities such as depression and stress. However similar to our study, Hosseinzadeh *et al.* showed higher prevalence of mood disorders among patients with constipation as compared to general population and thus recommended a principle planning for psychological treatment interventions among those who suffering constipation to minimize this gastrointestinal complication.

Also, in 1970, the role of dietary fibers on gastrointestinal motility was introduced [27,28]. After that time, the association between the use of fibers and improvement in constipation was frequently reported [28-32].

Limitation of study: Because of our study subjects were not smokers, the effect of cigarette smoking on functional constipation remained uncertain. But, it has been suggested that the use of nicotine can trigger constipation because of its Para-sympathomimetic effects of nicotine [33], however in some reports, no difference was found in the prevalence of constipation between smokers and non-smokers [34]. The beneficial effects of exercise on improvement or progression of constipation has been also questioned [35,36], however it seems that regular exercise activities may increase intestinal movements secondary to reduced mucosal blood flow as well as hormonal or neurogenic effects of exercise [37].

Conclusion

In total, it can be concluded high prevalence of functional constipation in medical interns especially in female gender, cases with low rate of eating breakfast, and deliberately ignoring defecation all might indicate the major role for anxiety in functional constipation in Iranian medical interns. Thus, the psychologic consults programs for modifying the anxiety in cases with functional constipation might be helpful.

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