

Psychiatric Morbidity and Somatic Symptoms in Patients with Functional Dyspepsia: A Comparative Study with Duodenal Ulcer Patients

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Abstract

Patients with functional dyspepsia (FD) would have a greater prevalence of treatable psychiatric disorders, higher scores on measures of psychiatric symptomatology and characteristic symptoms distinguishing them from those with duodenal ulcer (DU). The aim of the work is to study the prevalence of psychiatric disorders and somatic symptoms in patients with functional dyspepsia and in comparison to those of duodenal ulcer disease. We selected 100 consecutive FD patients and the same number of DU patients at their routine consultation at the outpatient's clinic of internal medicine of private general hospital at Abu Dhabi; UAE. Patients were subjected to full history, complete clinical examination, laboratory investigations, esophagogastroduodenoscopy and psychiatric evaluation through General Health Questionnaire (GHQ), Hospital Anxiety Depression Scale (HADS) and Structured Psychiatric Interview (PSE10). Patients with functional dyspepsia were significantly younger, more likely to be females, less tendency to smoke and use alcohol, had more frequent dyspeptic symptoms, a longer disease history and lower incidence of H.pylori infection than duodenal ulcer patients. Psychiatric morbidity was significantly higher in FD patients than DU patients (65% compared to 26%). Prevalence of psychiatric disorders was as follow: somatoform disorders 36%, mixed anxiety depressive disorder 21%, generalized anxiety disorder 17%, and depressive episode 4% in FD patients. As regard DU patients; somatoform disorders 8%, mixed anxiety disorder 10% and generalized disorder 8%. Using stepwise logistic regression model, it has been shown that, somatoform autonomic dysfunction and anxiety symptoms of (HADS) were independently associated with functional dyspepsia and the best predictors of diagnosing functional dyspepsia or duodenal ulcer. Psychiatric disorders are strongly associated with functional dyspepsia that warrants psychiatric intervention that may benefit FD patients specially those with chronic symptoms. Introduction

Introduction

Functional dyspepsia (FD) is considered a heterogeneous disorder with different pathophysiological mechanisms, contributing to the symptom pattern. The Room II committee proposed that subdividing patients FD patients with predominant pain versus discomfort might identify subgroups with homogenous clinical properties (Karamanolis et al., 2006). The term non ulcer dyspepsia reflects the previously dominant viewpoint that dyspepsia without ulcer represent, a

Functional gastrointestinal (GI) disorders such as the irritable bowel syndrome (IBS) and non ulcer dyspepsia (NUD) are characterized by chronic symptoms referable to the gastrointestinal tract in the absence of any biochemical or structural explanation (Sanfit and Jones, 2005). The patients with symptoms indicative of ulcer, but without evidence of ulcer, based on upper endoscopy, are given the diagnosis of non ulcer dyspepsia or functional dyspepsia

psychiatric disorders, higher scores on measures of psychiatric symptomatology and characteristic somatic symptoms distinguishing them from patients with duodenal ulcer.

Aim of the work:

The aim of this work was to study the prevalence of psychiatric disorders and somatic symptoms in patients with functional dyspepsia in comparison to those of duodenal ulcer disease.

Subjects & Methods

During one year period from (May 2005 to April 2006), one hundred consecutive patients with functional dyspepsia (FD) and the same number with those of duodenal ulcer (DU), were studied at their routine consultation at the outpatient's clinic of internal medicine of private general hospital at Abu Dhabi, UAE. All were Arab (local and non local). Patients were directly invited by the authors to participate in the study; they were informed that the objective was to assess the possible relationship between psychiatric disorders and upper gastrointestinal complaints. All patients provided informed consent after receiving a full explanation of the nature and protocol of the study. The study protocol was approved by the ethics committee of the hospital.

Consecutive patients with endoscopically verified duodenal ulcer were included in the study as a comparative group because of similarities of symptoms. Dyspeptic patients without any positive endoscopical findings and fulfill the Room II criteria for FD (Talley et al., 1999), were recruited to the FD group. The criteria for inclusion were: at least 3 months (within 1 year) of subjective, persistent or recurrent complaints of epigastric pain or discomfort,

special, more peaceful course of ulcer disease. However, repeated observation of functional dyspepsia patients show a low propensity of ulcer development (Vakil, 2002). Hypersecretion of gastric acid and the bacteria *Helicobacter pylori* which seem to be major etiological factors in duodenal ulcer (DU), do not seem to be important in functional dyspepsia (Talley and Quan, 2002). The cause of non ulcer dyspepsia (NUD) remains essentially unknown, but psychological factors have been implicated. For example, patients with NUD reported more life stress and psychological distress than healthy controls in clinic-based studies (Locke et al., 2004). German investigators reviewed, with meta analytic methods, observational studies on the association of FD with anxiety and depression. This association was established, with more patients with FD having major depression or any anxiety disorder than either healthy controls or patients with similar upper abdominal symptoms of known organic origin. The amount of self-reported depressive symptoms was not different between patients seeking medical care for their complaints and those who did not consult, but the degree of anxiety was higher in consulters than in non consulters (Henningsen et al., 2003). In support of these data are the results of a nested case-control study in a random community sample in the United States, showing that psychosocial factors, particularly somatization, interpersonal sensitivity, and total life event stress, were associated with FD (Locke et al., 2004). Also, depressive symptoms were found to be quite common in patients with FD (Jones et al., 2005).

Hypothesis and Aim of the Work:

Patients with functional dyspepsia would have a greater prevalence of treatable

from a formal psychiatric examination, performed to make a DSM-IV or ICD10 diagnosis and 4) information on recent psychiatric symptoms, obtained through General Health Questionnaire (GHQ), Hospital Anxiety Depression Scale (HAD). Psychiatric diagnoses were assessed according to ICD10 through structured psychiatric interview: present state Examination (PSE10).

General Health Questionnaire (GHQ):

The general health questionnaire is the most widely used screening test to detect psychiatric disorders in medical practice and measures possible prevalence of non psychotic psychiatric disturbances, especially anxiety and depressive disorders. We made use of the short GHQ 12 version in which each of the 12 items with a 4 answering categories was scored on a bimodal response scale resulting in a score ranging from (0 to 12). A cut-off score of (5-6) was used to discriminate possible psychiatric cases (score ≥ 6) and non cases (scores ≤ 5), which according to a GHQ evaluating study shows a positive and negative predictive value of 71% and 78% respectively (Hermert et al., 1995). All patients completed the Arabic version (El-Rufaie and Daradkeh, 1996).

Hospital Anxiety and Depression Scale (HADS):

The Hospital Anxiety and Depression Scale (HADS) were originally developed for use in hospital settings, as the name suggests. It was designed as a self-completed questionnaire to assess patients' anxiety and depression whilst in in-patient care according to two sub-scales. The Anxiety and Depression scales, both comprise 7 questions rated from a score of (0 to 3)

nausea, bloating or heartburn. The discomfort from the upper abdomen had to be the main abdominal complaint.

General exclusion criteria were: planned or previous surgical treatment (proximal gastric vagotomy or gastric resection), serious mental disorder, other somatic disorders requiring treatment, use of non-steroidal anti-inflammatory drugs (NSAID) or proton pump inhibitors or antibiotics and alcohol or drug abuse. In addition, FD patients with verified duodenal ulcer within the last 3 years, gallstones or esophagitis were excluded. Also, patients with indigestion due to heart, liver, pancreatic diseases or gastrointestinal malignancy were excluded.

Tools and Methods of Assessment:

Medical Examination: The functional dyspepsia and duodenal ulcer patients were medically examined by gastroenterologist (the author); the medical examination included a detailed medical history including dyspeptic symptoms, smoking and alcohol, coffee, tea and use of medications, clinical examination, abdominal ultrasonography, bed side laboratory investigations and H.pylori rapid urea breathe test (Chen et al., 2000) and Olympus GIF-XQ260 fibroptic upper gastrointestinal endoscopy.

Psychiatric Examination:

All patients were interviewed by a psychiatrists (the authors) blinded to the result of upper gastrointestinal endoscopy. During this interview, the following information was elicited: 1) demographic data 2) data on past psychiatric history including; previous psychiatric hospitalizations or visits to professionals; use, kinds and efficacy of psychotropic drugs and suicide attempts 3) information

therefore based on a process of matching the respondent's behavior and description of subjective experiences against the clinical definitions provided in the glossary of the SCALE (World Health Organization, 1992).

Statistical analysis:

All the data were recorded on investigative report form. These data were transferred to IBM card, using IBM compatible computer with statistical program (Statistical package for Social Sciences): SPSS for windows release 10.00 to obtain results.

Results:

Sociodemographic factors:

There was an overall highly significant group differences in age ($p < 0.05$) owing to being FD patients younger than DU patients. FD patients were more likely to be females (61% vs 39%), while women /men ratio in DU patients (47% vs 53%). Beyond this, there were no significant differences between the groups in socio demographic factors (Table1).

Life style factors: there was significant group difference in smoking. Patients with FD smoked less than DU-patients ($p < 0.05$). There was also a significant group difference in alcohol consumption ($p < 0.05$), FD patients consumed significantly less alcohol compared to DU-patients.

There was a significant group difference in irregular meals, 39% of FD patients had irregular meals which was significantly more than the DU patients (25%) ($p < 0.05$) (Table 2).

History and symptoms differences: There was a significant difference due to duration of dyspeptic complaints between FD and

depending on the severity of the problem described in each question. The two subscales can also be aggregated to provide an overall anxiety and depression score. The anxiety and depression scores are categorized as below: Aggregate Score: (0-7) Normal, (8-10) Mild, (11-14) Moderate and (15-21) Severe (Snaith and Zigmond, 1994). All patients completed the Arabic version of HADS (El-Rufaie and Absood, 1995).

Present State Examination 10th revision (PSE10) (WHO, 1992):

It is a part of the SCAN system (Schedule for Clinical Assessment in Neuropsychiatry), which is a set of instruments and manuals aiming at assessing, measuring and classifying the psychopathology and behavior associated with the major psychiatric disorders of adult life. The SCAN text has 3 components; the tenth edition of the Present State Examination (PSE10), the Item Group Checklist (IGC) and the Clinical History Schedule (CHS). PSE 10 itself has two parts: part I covers somatoform, dissociative, anxiety, depression, and bipolar disorders and problems associated with eating, alcohol and other substance use disorders. Part II covers psychotic and cognitive disorders and observed abnormalities of speech, affect and behavior.

The central Principle of the PSE is that the interview, although substantially structured, retains the features of a clinical examination. The aim of the interviewer is to discover which of a comprehensive list of phenomena have been present during a designated period of time and with what degree of severity. The examination is

score of 0 (0 -5). As regard DU patients 26% were considered as psychiatric cases whereas 74% showed no psychiatric disorders. FD patients scored significantly higher on Hospital anxiety depression scores than DU patients (table 4).

Table 5 shows the frequency of psychiatric disorders among both groups of patients, where it was found that: among FD patients 36% of them met the criteria for somatoform disorders (somatoform autonomic dysfunction 16%, somatization disorder 8% and hypochondriasis 12%), compared to 8% of DU patients (somatoform autonomic dysfunction 3%; somatization disorder 2% and hypochondriasis 3%) with statistical significant difference ($p < 0.05$); depressive episodes occurred only in 4% of FD patients. This table also shows that, mixed anxiety depression disorder occurred in 21% of FD patients compared to 10% of DU patients and generalized anxiety disorder occurred in 17% of FD patients, compared to 8% of DU patients with statistical significant difference ($p < 0.05$). Also, it was found that in 13% of FD patients, somatoform disorders were co morbid with mixed anxiety depressive disorders.

The result of logistic regression analysis:

Using stepwise logistic regression analysis ,it has been shown that ,while the initial model contained 17 variables; including : sex, life style factors ,dyspeptic symptoms and psychological measures; the final model included only 2 variables as best predictors of diagnosing functional dyspepsia or duodenal ulcer , the presence or absence of somatoform autonomic dysfunction and anxiety symptoms of HADS. The overall predictability of the model was found to be 87.5% (Table 6).

DU patients , each episode seemed to last longer for the FD patients , the mean duration for the actual episode of dyspeptic complaints being 8 months for FD patients and 5 months for the DU patients ($p < 0.05$). Epigastric pain was reported by 84% of DU compared to 73% of FD patients with no significant difference ($p > 0.05$). It was significantly frequently severe, occurred at night, and in clusters (episodic) in DU than FD patients ($p \leq 0.05$). Pain relief by food was significantly more often reported by DU (48%) than by those with FD patients (32%) ($P < 0.05$), whereas pain provoked by food was significantly more frequent in FD patients (45%) than in DU patients (31%) ($p < 0.05$). Otherwise, no significant difference in other pain characters. As regards other dyspeptic symptoms: bloating, postprandial fullness and early satiation were significantly more frequent in FD than DU patients ($p \leq 0.05$). Otherwise no significant difference in other dyspeptic symptoms (Table 3).

As regard the result of H. pylori breath test, it was positive in 48% of DU patients compared to only 12% of FD patients, with highly statistical significant difference ($p < 0.001$). Also it was found that 12% of FD patients reported history of treatment of anxiety and/or depressive disorders compared to 7% of DU patients and 12% of FD patients was under psychotropic medications (antidepressants and benzodiazepines), compared to 5% of DU patients with no statistical significant difference ($p > 0.05$).

Psychological measures: According to the GHQ cut-off score, 65% of FD patients were considered as psychiatric cases with a median range GHQ score of 8 (6–12), whereas 35% of patients showed no psychiatric disorders , with a median GHQ

Table (1): Sociodemographic characteristics of the studied groups:

Variables	FD Patients (n=100)	DU Patients (n=100)	Test	P
Age(years): Mean ± SD	33.55 5.8	43.44 3.7	t= -14.373	0.000*
Sex: No (%): Males Females	39(39%) 61(61%)	53(53%) 47(47%)	X ² 3.945	0.05*
Marital status: Single Married Divorced Widowed Separated	22(22%) 57(57%) 10(10%) 7(7%) 4(4%)	16(16%) 62(62%) 9(9%) 8(8%) 5(5%)	X ² 1.388	0.85
Occupation: Active remunerated Active non remunerated Inactive	60(60%) 19(19%) 21(21%)	56(56%) 20(20%) 24(24%)	X ² 0.364	0.83
Education: Primary Preparatory Secondary University Postgraduate	12(12%) 10(10%) 37(37%) 34(34%) 7(7%)	13(13%) 10(10%) 38(38%) 35(35%) 4(4%)	X ² 0.886	0.927

Active non-remunerated: student & housewife

Inactive: retired & unemployed

*Significant P≤ (0.05)

Table (2): Life style factors:

Factors	FD Patients (n=100)	DU Patients (n=100)	Test	P
Smoking : Never Formerly Current	48(48%) 15(15%) 37(37%)	31(31%) 21(21%) 48(48%)	X ² 6.82	0.03*
Alcohol use	5(5%)	13(13%)	X ² =3.907	0.05*
Irregular meals	39(39%)	25(25%)	X ² =4.504	0.05*

* Significant (p≤0.05)

Table 3): Dyspeptic symptoms in FD and DU Patients:

Patients Symptoms	FD Patients (n=100)	DU Patients (n=100)	test	P
Duration of symptoms (in months): Mean $\pm$ SD	8.14 $\pm$ 11.29	5.12 $\pm$ 1.83	T= 0.264	0.009*
Pain:				
Epigastric	73(73%)	84(84%)	$X^2=3.585$	0.06
Frequently severe	37(37%)	51(51%)	$X^2= 3.977$	0.05*
Relieved by food	32(32%)	48(48%)	$X^2=5.333$	0.02*
Relieved by antacids	73(73%)	66(66%)	$X^2=1.156$	0.28
provoked by food	45(45%)	31(31%)	$X^2 4.160$	0.04*
occurs at night	32(32%)	50(50%)	$X^2 6.697$	0.01*
cluster(episodic)	34(34%)	48(48%)	$X^2 4.051$	0.04*
Anorexia	35(35%)	32(32%)	$X^2= 0.202$	0.7
Vomiting	30(30%)	35(35%)	$X^2= 0.57$	0.5
Bloating	50(50%)	35(35%)	$X^2= 4.604$	0.03*
Belching	59(59%)	50(50%)	$X^2= 1.633$	0.2
Heart burn	28(28%)	40(40%)	$X^2= 3.209$	0.07
Post prandial fullness	53(53%)	39(39%)	$X^2 = 3.945$	0.05*
Early satiation	50(50%)	36(36%)	$X^2 = 3.998$	0.05*

* Significant: ($p \leq 0.05$)**Table (4): Hospital Anxiety Depression Scores (HAD) among both groups of patients:**

Patients Scores	FD Patients (n=100)	DU Patients (n=100)	test	P
HAD depressive scores:				
No of Patients (%)				
Normal	35(35%)	74(74%)		0.000 *
Mild & Moderate	40(40%)	16(16%)	$X^2=30.668$	
Severe	25(25%)	10(10%)		
HAD anxiety scores:				
Normal	35(35%)	74(74%)		
Mild & Moderate	45(45%)	12(12%)	$X^2=34.118$	0.000 *
Severe	20(20%)	14(14%)		

*Highly Significant ($p < 0.01$)

Normal (0-7), Mild (8-10), Moderate (11-14), Severe (14-21)

Table (5): Prevalence of ICD10 Psychiatric disorders among both groups of patients:

Disorders	Patients	FD Patients (n=100)	DU Patients (n=100)	Test	P
Depressive episode		4(4%)	0(0%)	X ² 4.082	0.04*
Mixed anxiety depressive disorder		21(21%)	10(10%)	X ² 4.619	0.03*
Generalized anxiety disorder		17(17%)	8(8%)	X ² 3.703	0.05 *
Somatization disorder		8(8%)	2(2%)	X ² 3.789	0.05 *
Hypochondriasis		12(12%)	3(3%)	X ² 5.838	0.02 *
Somatoform autonomic dysfunction		16(16%)	3(3%)	9.828	0.002 *

* Significant : ($p \leq 0.05$).

**Table (6): The Results of Logistic Regression Analysis:
Final Logistic Regression Model:**

Variables	B	SE	Walds't'	P	Odds ratio
Somatoform autonomic dysfunction:	- 5.6	1.2	23.4	0.000 *	0.004
Anxiety scores:	- 2.4	0.5	22.8	0.000 *	0.09
Heart burn:	11.2-	16.8	0.4	0.51	0.000
Early satiation:	9.8	16.8	0.3	0.56	6.8
Constant:	6.5	1.3	25.2	0.000	-

* Statistical significant at $p < 0.01$ level

SE: Standard error of B

Model X²:114.5 $p = 0.000$

B : Regression coefficient

This table shows that while the initial model contained 17 variables, the final model included only 2 variables as best predictors of diagnosing functional dyspepsia or duodenal ulcer: somatoform autonomic dysfunction and anxiety scores of (HAD). The over all predictability of the model was found to be 87.5%.

Discussion

In spite of similar clinical symptomatology of FD and DU patients, they comprised at least two different somatic entities. The patients differ in illness history, life style factors, symptom characteristics and measures of psychiatric symptomatology and prevalence of psychiatric disorders.

Sociodemographic characteristics of FD and DU groups:

There was an overall a significant difference between both groups regarding age and gender, as FD patients was younger and more likely to be females than DU patients. These findings were consistent

with other previous studies (Hsu et al., 2002 and Pajala et al., 2005)

Life style factors:

Smoking was found to be less common in FD group than DU group. This result was found to be consistent with other previous studies (Archimandritis et al., 1995 and Haug et al., 1994). Many studies reported the significant role of smoking as a risk factor for peptic ulcer disease (Luo et al., 2002 and Maity et al., 2003). FD patients use alcohol significantly less than DU patients and the overall percentage in both groups were found to be small as compared to the percentage in western studies. This could be explained by cultural differences and religious attitude in our culture that alcohol is prohibited. Patients with FD had more irregular meals than DU patient. This can be a causal factor or a result of their dyspepsia.

Dyspeptic complaints:

Patients with FD had a longer disease history and reported more frequent dyspeptic symptoms compared to patients with duodenal ulcer. This may reflect the fact that these patients have a low threshold to visceral pain and visceral hypersensitivity that is currently regarded as the mechanism responsible for both motor alteration and abdominal pain in functional bowel disorders including FD (Mahony et al., 2006). The expression of dyspeptic symptoms may also be influenced by the personality profile as neurotic patients may seek medical advice sooner and more often than those who are emotionally stable (Cecilia et al., 2004). Also, this finding could be also explained by psychological distress that affects illness behavior, where in our study we found a

high prevalence of psychiatric morbidity. Cheng (2000), examined the difference in behavioral and perceptual characteristics between non consulter and consulter in FD in a Chinese population, he found that the non consulters were distinguishable by their perceptual style copying behaviors and psychological symptoms. Moreover, high level of anxiety and depression were found to be highest in consulter compared to non consulter and healthy controls.

In our study, FD patients had more bothersome postprandial fullness in upper abdomen that occurs after ordinary sized meals and several times a week as well as early satiation that prevents finishing a regular meal. This finding was found to be consistent with the study done by Camilleri et al., 2005.

Also, it was found that the incidence of *H.pylori* infection was significantly higher in DU patients (48%) than FD (12%). This result was consistent with many previous studies (Karamanolis et al., 2006; McColl et al., 1997 and Tally et al., 2005).

Psychiatric co morbidity:

Our results revealed that psychiatric morbidity was significantly higher in FD patients than DU patients, where general health questionnaire screening detected 65% of psychiatric cases compared to 26% of DU patients. Also, FD patients scored significantly higher on depression and anxiety scale (HAD) than DU patients ($p < 0.001$). Also, FD patients had significantly more psychiatric diagnoses on ICD10 compared to DU patients. The most common psychiatric disorders were somatoform disorders, anxiety disorders and depressive disorders. In our multiple logistic regression models somatoform

autonomic dysfunction and anxiety symptoms were independently associated with functional dyspepsia suggesting that these factors may be involved in the etiopathogenesis rather than just driving health care utilization i.e. act as confounding factors.

Our results were consistent with previous studies abroad. Magni et al., (1987) in a clinical based study found that 87% of FD patients, compared to 25% of patients with organic dyspepsia, had a psychiatric diagnosis. A larger study using structured interview and psychometric tools revealed that 34% of FD patients versus 15% of DU patients had a psychiatric diagnosis; the authors also found that the psychometric test for multiple somatic complaints was the most powerful discriminating factor, followed by general psychopathology and anxiety suggesting that involvement of these factors in the causative pathway of FD (Haug et al., 1994).

In the same direction, Pajala et al (2005) reported in their study that the prevalence of mental distress among patients with functional dyspepsia and organic dyspepsia was 38% and 36.4% respectively, these findings are not consistent across studies but conflicting results may be explained by use of different sample populations.

In contrast to the latter findings, an earlier study demonstrated no statistically significant difference between functional dyspepsia and duodenal ulcer patients on various psychometric tests scores. However, elevated level of neuroticism, anxiety and depression were found in FD patients compared to controls. No explanation was offered for the lack of difference between DU and FD patients (Talley et al., 1996). Moreover, another study had demonstrated no psychological

difference between people with functional bowel disorders who have not consulted a physician compared to community based health controls (Smith et al., 1990), this has engendered the association that psychosocial factors are not implicated in the etiopathogenesis of FD and irritable bowel syndrome but rather serve to motivate health care seeking.

More recently, in contrast to this dogma elevated level of psychological distress across all domains (except phobic anxiety) of the SCL-90-R, a measure of psychological state have been demonstrated in a population based study of subjects with functional gastrointestinal disorders (functional dyspepsia and irritable bowel syndrome), inclusive of both consulters and non consulters suggesting that these factors may be involved in the etiopathogenesis rather than just driving health care utilization (Locke et al., 2004).

In our Arab culture, Abdulhafeiz et al. (2002); in a case control study investigated the relationship between functional dyspepsia, life events and mental illness, they found that psychiatric illness was significantly more in patients than the controls. Anxiety and depressive disorders dominated the clinical picture (84%) and the symptoms were of mild nature

In our study, somatoform disorders were reported in 36% of FD patients, this could be explained by the suggestion that the psychosomatic patients are assumed to have difficulties in expressing emotions verbally and to have tendency to react with different somatic complaints (Porcelli et al., 2004). Also, it has been suggested that, somatizing symptoms can be a cultural mode of expressing mental distress in ethnic groups including Arab culture. Okasha (2004); reported that depression among Egyptian

patients is manifested mainly by agitation, somatic symptoms, hypochondriasis, physiological changes such as decreased libido, anorexia and insomnia, which is not characterized by early morning awakening. Egyptian patients mask their affect with multiple somatic symptoms, which occupy the foreground and the affective component of their illness recedes to the background. This may be because of the greater social acceptance of physical complaints than of psychological complaints, which are either not taken seriously or are believed to be cured by rest or extra praying. The increase in somatic symptoms can be explained by the seriousness with which people in a given culture view 'psychological stresses compared with physical illnesses.

The association of psychiatric morbidity and FD could be explained through the gut-brain axis it has become more evident that FD is a biopsychosocial disorder (Alders, 2000), in which gastrointestinal motor abnormalities, altered visceral sensation and psychosocial factors interact to generate the symptoms. The motor, sensory and secretory activities of the gut occur through the bidirectional communication between the central nervous system, the autonomic nervous system and the enteric nervous system. FD symptoms may result from deregulated interactions at any level of the brain-gut axis (Thumshirn, 2002).

Though high prevalence of psychiatric disorders in FD patients, only small percentage (12%) were under psychiatric treatment, and also 5% of those with DU, that could be explained by lack of mental health awareness and stigma of mental illness in our culture. So efforts should be directed towards identification and management of these obstacles.

The present study has found that FD patients have more or less distinctive clinical characteristics; significantly higher prevalence of somatoform, anxiety and depressive disorders distinguishing them from DU patients. Somatoform autonomic dysfunction and anxiety symptoms were the most predictive of diagnosis and differentiating between FD and DU patients suggesting that these factors may be involved in the etiopathogenesis of FD rather than just driving health care utilization. It should be clear, however, that the model constructed in this study should by no means replace diagnostic testing, but should be considered a helpful aid for doctors as well as for patients especially when upper gastroendoscopic finding is negative and the symptoms are bothersome chronic.

Co morbid psychiatric illness in FD patients warrants treatment with conventional therapies. Available evidence suggests psychological therapies may benefit FD patients particularly those with chronic symptoms. The rationale for use of psychotropic medications in FD patients is apparent. Future studies are needed to evaluate the efficacy of antidepressants and psychotherapeutic measures in relieving suffering of FD patients. Primary care physicians and gastroenterologists should be aware of these psychiatric disorders for early identification and management or referral to mental health professionals in some cases. Our results suggesting that functional dyspepsia and psychopathology share common pathophysiology that warrant further examination.

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