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Research Article

Psychological disorders and personality characteristics of with gastro-esophageal reflux disease

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ABSTRACT

Background: Gastro-esophageal reflux disease (GERD) can be traced back to disorders of the gastro-esophageal junction but several psychological factors interact to affect treatment outcomes. There is sparse literature from India regarding psychological co-morbidity and personality characteristics in patients with GERD.
Aim and Objectives: To study the co-morbid psychological disorders and personality profiles in patients suffering from GERD.
Methods: Two hundred patients with GERD-related symptoms were randomly screened for psychological disorders and personality characteristics using 30-item General Health Questionnaire (GHQ) and Sixteen Personality Factor Questionnaire (16PF) respectively. Patients who screened positive for presence of co-morbid psychological disorders were further interviewed using Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID-1) to find out the type of psychological disorder.
Results: The prevalence of psychological co-morbidity in patients with GERD-related symptoms in our sample was found to be 40%. Major depressive disorder was the most common psychological disorder found co-morbid in these patients. Alcohol dependence was significantly observed in males; while in females, major depressive disorder and generalized anxiety disorder was more commonly seen. Regarding personality characteristics, a higher degree of neuroticism and risk-taking attitudes was found in patients of GERD with associated psychological co-morbidity
Conclusions: This study suggests that the management of GERD may include psychological evaluations and possibly interventions in standard treatment protocols.

Keywords: GERD, GORD, Psychological disorders, Personality traits, Co-morbidity

INTRODUCTION

Psychosomatic medicine has been a specific area of study within the field of psychiatry for more than half a century. The term 'psychosomatic' refers to how the mind affects the body. Psychological co-morbidity has significant effects on medically ill patients and is often a risk factor for their medical conditions. Gastrointestinal (GI) disorders rank high in medical illnesses associated with psychiatric consultations. Psychological factors commonly influence the onset, severity and outcome in GI disorders.[1]

Gastro-esophageal reflux disease (GERD) is defined as symptoms caused by the abnormal reflux of gastric contents into the oesophagus.[2] The most common symptoms are heartburn and regurgitation of stomach acid. Other symptoms may include odynophagia, excessive salivation (water brash), nausea, chest pain and coughing. The diagnosis of GERD is usually made when these symptoms are present. According to the accepted Montreal classification, GERD may be associated with acid reflux, weakly acid reflux (for example as seen in esophageal hypersensitivity), or non-acid reflux.[3] It has been increasingly recognized that psychological stress

has a major impact on gut function and research shows that stress can cause a barrier dysfunction of the gastrointestinal mucosa.[4] Recent studies show that psychological co-morbidity in patients suffering from GERD has been shown to adversely affect the outcome of successful anti-reflux surgery and failure of treatment by proton pump inhibitors (PPI).[5,6]

GERD appears to be highest in North America and Europe with the prevalence of 14%-28% for GERD.[7,8] GERD had been thought to be uncommon amongst Asians but recent research have shown an increasing trend.[9] There is not much data from Asia but a few studies have reported prevalence between 7.5% - 16.2%.[10-13]

The relationship between GERD and psychological disorders has been recognized in research from certain countries,[13-17] but in the Indian context, there exists a paucity of data. Therefore this study was conducted to find out the co-morbid psychological disorders and personality profiles in patients suffering from GERD.

METHODS

This was a cross-sectional, observational study conducted over a period of one and half years (January 2011-June 2012) after obtaining permission from the Institutional Ethics Committee. Two hundred adult patients diagnosed with GERD-related symptoms (by a gastroenterologist) and attending the gastrointestinal outpatient department at a tertiary care hospital in Navi Mumbai, India, were selected randomly (using computer-generated table of random numbers) for the study. Informed consent was taken from those who were eligible and willing to participate in the study. The sample patients were screened for presence of psychological co-morbidity using the 30-item General Health Questionnaire (GHQ-30) – an excellent quick screener widely used by researchers and clinicians who wish to screen individuals for psychological disorders. The items of the GHQ have a 4 point scoring system (0-0-1-1) which produces an overall score that can be compared with a prescribed cut-off score (in this case greater than or equal to 5) indicating presence of psychological morbidity.[18] They were also administered the 16-Personality Factor Questionnaire (16-PF) a multiple-choice questionnaire for evaluating personality characteristics based on Cattell's factor-analytic theory. It contains 185 questions with a three point answer format and provides scores on 16 primary scales and 5 global scales.[19] The patients with underlying psychological co-morbidity (i.e. GHQ score ≥ 5) were further interviewed using the Structured Clinical Interview for DSM-IV Axis-1 Disorders (SCID-1),[20] and a mental status examination was also done, for diagnosing the type of psychiatric disorder according to DSM-IV-TR criteria. Medical history was obtained through personal interview and from medical records. Patients not wiling for informed consent, with severe co-morbid medical illnesses requiring hospitalization and those with severe psychological disorders (like history of violence, severe thought disorders, suicidal or requiring hospitalization) were excluded from the study.

Statistical analysis: Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version-17 software. Data was expressed in actual numbers, mean and percentage. Statistical tests like T-Test for equality of means, Pearson's Chi-Square test and Fisher's Exact Test were used for categorical data. Probability '*P*' value of less than 0.05 was considered as statistically significant.

RESULTS

GERD and Psychological co-morbidity

The prevalence of psychological co-morbidity (GHQ score ≥ 5) in patients with GERD-related symptoms was found to be 40%. The mean duration of GERD symptoms was significantly (*P*<0.001) greater in the patients having psychological co-morbidity [Table 1].

Table 1: Socio-demographic details of the sample patients with GERD-related symptoms.

Parameters		Patients with GERD	GERD with associated psychological co-morbidity (GHQ* ≥ 5)	GERD without psychological co-morbidity (GHQ* < 5)	(t-test) Chi-square	*P* value
No. of Patients		200 (100%)	80 (40%)	120 (60%)	-	-
Duration of GERD (in months)	(Mean ± S.D.)	20.51 ± 22.63	31.86 ± 29.58	12.93 ± 11.44	(-6.340)	< 0.001
Age (in years)	(Mean ± S.D.)	38.41 ± 9.43	41.10 ± 7.56	36.62 ± 10.13	(3.378)	< 0.001
Age range (in years)	20 – 29	26	4	22	14.867	0.002
	30 – 39	82	28	54		
	40 – 49	60	34	26		
	50 – 59	32	14	18		
Sex	Male	112	38	74	3.356	0.067
	Female	88	42	46		

* GHQ: General Health Questionnaire score

Major depressive disorder was the most common psychological disorder found in patients with GERD-related symptoms (15% i.e. 30 out of 200). Alcohol dependence was significantly (*P*=0.001) observed in males. Major depressive disorder and generalized anxiety disorder was more commonly seen in females [Table 2].

Regarding the age-wise assessment of psychological co-morbidity in patients with GERD, alcohol dependence was observed significantly (*P*=0.005) in the age group of 50-59 years with mean duration of alcohol consumption being 14.83 ± 7.71 years. Major depressive disorder was observed significantly (*P*=0.001) in the 40-49 years age group [Table 3].

GERD and Personality characteristics

Regarding the Primary Personality traits (based upon the 16-PF), patients of GERD with psychological disorders scored significantly (*P*<.001) low on factors B (Reasoning), C (Emotional Stability), G (Rule-Consciousness) and Q3 (Perfectionism) and significantly (*P*<.001) high on factors E (Dominance), H (Social Boldness), M (Abstractedness), O (Apprehension), and Q4 (Tension). Factors I (Sensitivity), L (Vigilance) and N (Privateness) was significantly (*P*<.001) more in patients with psychological problems while Q1 (Openness to Change) and Q2 (Self-Reliance) was found more in those without. Thus on the evaluation of personality traits, it was found that patients with GERD having associated psychological disorders were more likely to have low mental capacity with concreteness in thinking (low factor B), higher reactivity to circumstances (low factor C), became tense and worried more easily (high factors O and Q4), and could endure physical disorders for longer time than others (low factor Q3). Highly driven persons (high factor Q4), who were very forceful (high factor E), highly imaginative (high factor M) and having risk-taking (high factor H) and non-conforming attitudes (low factor G) were also more prone to develop psychological problems. Patients without psychological disorders were likely to be less sensitive (factor I), vigilant (factor L) and more self reliant (factor Q2) and open to change (factor Q1) [Tables 4a and 4b].

Regarding the Global Personality traits based upon the 16-PF, patients with GERD related symptoms with associated psychological co-morbidity were more likely to be highly anxious and easily perturbed; while those without psychological co-morbidity were significantly (*P*<.001) more likely to be extroverted, self-controlled, tough-minded and independent [Table 5].

Table 2: Gender based analysis of the types of psychological co-morbidities (using the SCID-1) in patients with GERD-related symptoms.

Psychological Disorder in GERD patients (GHQ* ≥ 5)		Sex (N=80)				
		Male	Female	Total	Chi square	*P* value
Major depressive disorder	Present	10	20	30	0.37	0.58
	Absent	28	22	50		
Generalized Anxiety	Present	6	12	18	0.22	0.64
	Absent	32	30	62		
Alcohol dependence	Present	18	0	18	25.67	0.001
	Absent	20	42	62		
Bipolar I disorder	Present	14	12	26	0.07	0.87
	Absent	24	30	54		
Panic disorder with Agoraphobia	Present	0	14	14	1.64	0.22
	Absent	38	28	66		
Bipolar II disorder	Present	8	4	12	0.57	0.54
	Absent	30	38	68		
Dysthymic disorder	Present	4	4	8	0.01	0.99
	Absent	34	38	72		
Panic disorder without Agoraphobia	Present	2	6	8	0.35	0.6
	Absent	36	36	72		
Obsessive Compulsive Disorder	Present	4	4	8	0.01	0.90
	Absent	34	38	72		
Somatization disorder	Present	0	4	4	1.05	0.27
	Absent	38	38	76		
Hypochondriasis	Present	2	0	2	2.27	0.13
	Absent	36	42	78		

* GHQ: General Health Questionnaire score

Table 3: Age group-wise analysis of the types of psychological co-morbidities (using the SCID-1) in patients with GERD-related symptoms.

Psychological Disorders in GERD patients (GHQ* ≥ 5)		Age (N=80)						
		18-29 Years	30-39 years	40-49 years	50-59 years	Total	Chi square	*P* value
Major depressive disorder	Present	0	12	16	2	30	21.51	0.001
	Absent	4	16	18	12	50		
Alcohol dependence	Present	2	6	2	8	18	10.03	0.005
	Absent	2	22	32	6	62		
Generalized Anxiety	Present	2	4	10	2	18	2.45	0.48
	Absent	2	24	24	12	62		
Bipolar I disorder	Present	2	10	6	8	26	10.56	0.16
	Absent	2	18	28	6	54		
Panic disorder with Agoraphobia	Present	2	4	6	2	14	0.37	0.94
	Absent	2	24	28	12	66		
Bipolar II disorder	Present	0	4	6	2	12	1.58	0.64
	Absent	4	24	28	12	68		
Dysthymic disorder	Present	0	2	4	2	8	0.11	0.99
	Absent	4	26	30	12	72		
Panic disorder without Agoraphobia	Present	0	4	6	0	8	1.84	0.61
	Absent	4	24	28	14	72		
Obsessive Compulsive Disorder	Present	0	6	2	0	8	5.72	0.13
	Absent	4	22	32	14	72		
Somatization disorder	Present	0	0	4	0	4	5.47	0.014
	Absent	4	28	30	14	76		
Hypochondriasis	Present	0	2	0	0	2	3.76	0.29
	Absent	4	26	34	14	78		

* GHQ: General Health Questionnaire score

Table 4a: Comparison of Primary Personality traits (using the 16-PF*) in patients with GERD-related symptoms with and without psychological co-morbidity.

Primary Personality Factors (using 16-PF*)	Range	GERD patients with associated psychological co-morbidity (N=80)	GERD patients without psychological co-morbidity (N=120)	Chi square (Fisher's Exact)	*P* value
'A' Warmth	Low	44	62	1.92	0.38
	High	16	18		
	Normal	20	40		
'B' Reasoning	Low	34	16	34.1 (39.18)	< 0.001
	High	0	26		
	Normal	46	78		
'C' Emotional Stability	Low	62	28	63.92 (73.3)	< 0.001
	High	0	40		
	Normal	18	52		
'E' Dominance	Low	14	52	18.18	< 0.001
	High	16	8		
	Normal	50	60		
'F' Liveliness	Low	34	46	1.5	0.47
	High	32	16		
	Normal	14	58		
'G' Rule-	Low	22	4	24.99	< 0.001
	High	40	32		

Consciousness	Normal	18	84		
'H' Social Boldness	Low	48	50	45.14	< 0.001
	High	26	10		
	Normal	6	60		
'I' Sensitivity	Low	0	38	46.85 (57.9)	< 0.001
	High	0	14		
	Normal	80	68		

*16-PF: Sixteen Personality Factor Questionnaire

Table 4b: Comparison of Primary Personality traits (using the 16-PF*) in patients with GERD-related symptoms with and without psychological co-morbidity.

Primary Personality Factors (using 16-PF*)	Range	GERD patients with associated psychological co-morbidity (N=80)	GERD patients without psychological co-morbidity (N=120)	Chi square (Fisher's Exact)	*P* value
'L' Vigilance	Low	14	16	15.18	< 0.001
	High	22	66		
	Normal	44	38		
'M' Abstractedness	Low	18	34	45.22 (50.2)	< 0.001
	High	26	0		
	Normal	36	86		
'N'' Privateness	Low	2	20	51.12 (61.7)	< 0.001
	High	0	40		
	Normal	78	60		
'O' Apprehension	Low	0	38	56.24	< 0.001
	High	50	20		
	Normal	30	62		
'Q1' Openness to Change	Low	30	40	20.4	< 0.001
	High	0	26		
	Normal	50	54		
'Q2' Self-Reliance	Low	6	32	12.15	< 0.001
	High	24	34		
	Normal	50	54		
'Q3' Perfectionism	Low	38	0	72.8 (82.2)	< 0.001
	High	4	26		
	Normal	38	94		
'Q4' Tension	Low	0	38	176.7 (215.3)	< 0.001
	High	74	0		
	Normal	6	82		

*16-PF: Sixteen Personality Factor Questionnaire

Table 5: Comparison of Global Personality traits (using the 16-PF) in patients with GERD-related symptoms with and without psychological co-morbidity.

Global Personality Factors (using 16-PF†)	Range	GERD with associated psychological co-morbidity (GHQ* ≥ 5)	GERD without associated psychological co-morbidity (GHQ* < 5)	Chi-square (Fisher's Exact)	*P* value
Extroversion/ Introversion	Low	39	16	69.5	< 0.001
	High	23	6		
	Normal	18	98		

Anxiety	Low	0	6	27.66 (27.51)	< 0.001
	High	22	4		
	Normal	58	110		
Receptivity / Tough-mindedness	Low	26	20	17.76 (17.45)	< 0.001
	High	6	0		
	Normal	48	100		
Independence / Accommodation	Low	16	36	10.96	0.004
	High	6	24		
	Normal	58	60		
Self control / Lack of restraint	Low	4	0	6.44 (5.91)	0.04
	High	2	5		
	Normal	74	115		

*GHQ: General Health Questionnaire score;†16-PF: Sixteen Personality Factor Questionnaire

DISCUSSION

GERD and Psychological co-morbidity

The prevalence of 40% psychological co-morbidity in patients with symptoms of GERD found in our sample was similar to that documented in other studies.[13-17] This shows that psychological co-morbidity in patients of GERD is as prevalent in Navi Mumbai (a satellite city of Mumbai, India) as in other parts of the world. This is could be a crucial area of concern and only further epidemiological studies can show whether it is the same throughout India. A study by Rosaida and Goh had concluded that the Indian race is an independent risk factor for development of GERD.[21]

The mean duration of GERD related symptoms was significantly greater in patients having psychological co-morbidity which is supported by a study by Núñez-Rodríguez and Miranda[22] which showed that GERD patients with long duration of disease had increased chances of psychological distress.

In our study, major depressive disorder was the most prevalent psychological co-morbidity found. This was similar to other studies[23,24] that have demonstrated a strong relationship between gastrointestinal symptoms and depressive disorders. A study conducted by Jansson *et al* reported that patients with depression had 1.7-fold risk of GERD, those with anxiety had a 3.2-fold increased risk, while in those with both the risk was had 2.8-fold.[24]

Similar to other studies,[8,13,21,25] in our study too, women with GERD-related symptoms were more commonly found to have depressive and anxiety disorders.

Several authors[8, 21, 26-28] have demonstrated an association between alcohol consumption and gastro-esophageal reflux disease. Our study too has shown that there was a significant association between prolonged consumption of alcohol and gastro-esophageal reflux disease. According to Chen et al, the reasons for this could be many, e.g. (1) prolonged and repeated exposure of the esophagus and stomach to alcohol causing direct damage to esophageal and gastric mucosa, (2) the acetaldehyde metabolized from alcohol adversely affecting the functions of the esophagus and stomach, (3) dysfunctions of the lower esophageal sphincter leading to reflux of the gastric contents, (4) disturbed esophageal peristalsis and (5) abnormal gastric acid secretion due to alcohol use, may all be involved in the pathogenesis of alcohol-related GERD.[26]

GERD and Personality characteristics

Similar to other studies,[28,29] in our study too, subjects who were highly anxious and easily perturbed were more likely to be associated with GERD-related symptoms and psychological co-morbidity. According to Johnston et al, personality factors modulate the effects of stress on the gastro-esophageal junction and can influence the perception and assessment of gastro-intestinal symptoms. They showed that persons prone for GERD were more likely to interpret harmless events as 'hassles' or to perceive them with greater intensity.[28] Subic-Wrana et al, noted that individuals with decreased emotional awareness often fail to experience affective arousal as feelings and instead experience emotional distress somatically.[30]

Our study has certain limitations. The sample was chosen out of GERD patients already diagnosed by a gastroenterologist and having GERD-related symptoms. No esophageal impedance testing or 24 hr pH testing was further performed on any of the sample patients during the course of the study. So some patients may be likely to have functional heart burn along with the actual reflux.

CONCLUSIONS

Patients with long-standing GERD-related symptoms were more likely to be associated with psychological disorders. Women with symptoms of GERD were more likely to have associated depressive or anxiety disorders. Prolonged alcohol consumption was more likely to be associated with

GERD. Regarding personality characteristics, a higher degree of neuroticism and risk-taking attitudes was more likely to be found in patients with symptoms of GERD and associated psychological co-morbidity. This study suggests that the management of GERD may include psychological evaluation and possibly interventions in standard treatment protocols. This knowledge can therefore be incorporated in the regular process of medical diagnosis and therapy of GERD patients especially for those with long standing or refractory symptoms. Strong evidences are still outstanding and need to be further investigated in future studies.

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