Comparison of psychiatric morbidity in patients with irritable bowel syndrome and non-ulcer dyspepsia

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Background and Aims: The present study aimed to find psychiatric morbidity, stress, anxiety, and depression in patients with irritable bowel syndrome (IBS) and compare it with patients having non-ulcer dyspepsia (NUD). Methods: This case NUD study compared 50 patients each with IBS and NUD. The two groups were compared on demographic data, psychiatric diagnosis using the Structured Clinical Interview for DSM-IV Axis 1 disorders, anxiety levels using the Hamilton Anxiety Rating Scale (HAM-A), and depression using the Hamilton Depression Rating Scale (HAM-D). The Presumptive Stressful Life Events Scale (PSLES) was used to measure stress. Results: The cases of IBS were more likely to be of female gender (P = 0.012), married (P = 0.009), and employed (P < 0.001). Psychiatric diagnoses were more common in the cases of IBS than NUDs (88% vs. 30%, P < 0.001), the most common being major depression and somatization disorder. Symptoms of anxiety and depression were more common in patients with IBS (P < 0.001 for HAM-A and HAM-D). Logistic regression revealed that having IBS and increased age were independent predictors of having a psychiatric diagnosis. Conclusions: IBS is associated with the considerable degree of psychiatric morbidity. Adequate attention should be paid toward comorbid psychiatric illnesses, and prompt treatment should be instituted.

Keywords: Irritable Bowel syndrome, nonulcer dyspepsia, psychiatric comorbidity,
Rural India

Irritable bowel syndrome (IBS) is a gastrointestinal (GI) disorder which is presumed to have a significant psychological overlay.1,2 IBS is typically a chronic disorder characterized by abdominal discomfort associated with relief after defecation, along with a change in frequency or consistency of stools.3 The disorder affects the quality of life of the sufferers adversely and is associated with frequent healthcare visits and high treatment costs.4-7

IBS has been reported to be associated with significant psychiatric morbidity.8,9 It has been seen that up to 90% of patients with IBS may have associated psychiatric disorders.10,11 The disorders commonly encountered in patients with IBS include depression,9,10 generalized anxiety,9,10 panic disorder,9,10 somatization disorder,9,12 and substance use disorders.13 Anxiety and depression have been noticed to be important concomitants of IBS and adversely affect patient outcomes.14 Patients with IBS have been compared with patients having other GI disorders in terms of psychiatric comorbidity. The reports have been conflicting as some studies suggest IBS to be associated with greater proportion of psychiatric morbidity,9 while other studies suggest that substantial differences do not exist.15

It has been suggested that culture plays an important role in the presentation of IBS, and ethnic diversities...
influence the manifestations of this disorder.\textsuperscript{[16,17]} However, studies from South Asian ethnicity exploring psychiatric comorbidity of IBS have been sparse.\textsuperscript{[13,18,19]} Hence, this study was conducted to assess psychiatric disorders, stress, depression, and anxiety in patients with IBS in the Indian population and compare with a suitable nonulcerative dyspepsia (NUD) from GI disorders.

\textbf{METHODS}

\textbf{Setting of the study and participant selection}

The present case - NUD study was conducted in a tertiary-care multispeciality teaching hospital in Central India. The hospital caters to both urban and rural patients from the region. Patients are either self-referred or referred from other centers. Patients seek treatment for a variety of medical and surgical complaints. The present study was conducted among patients with IBS or NUD referred from the departments of medicine and surgery after appropriate investigations. The investigations commonly conducted included hemogram, liver function tests, kidney function tests, ultrasound abdomen, and where required, upper or lower GI endoscopy. The diagnosis is clinically made by specialist based on findings on history, examination, and investigations.

For the purposes of the study, the inclusion criteria for cases were: Age between 15 and 65 years, diagnosis of IBS according to ROME II Criteria,\textsuperscript{[10]} and duration of illness of more than 1 year. NUDs comprised patients aged 15–65 years diagnosed with NUD of more than 1-year duration. Those patients having comorbid medical illnesses, having a clinical history consistent with subnormal intelligence, being already on psychotropic medications, being pregnant or nursing were excluded from both groups. NUDs were matched with cases with respect to age. Those patients fulfilling the inclusion and exclusion criteria were recruited in the study after obtaining informed consent.

\textbf{Procedure}

The present study involved one-time assessment of cases and NUDs. Information was obtained from both groups about the demographic characteristics such as age, gender and marital status, illness characteristics, meal habits, and dietary patterns (vegetarian or nonvegetarian). The type of IBS was classified as diarrhea-predominant, constipation-predominant, or alternating type. The meal habits were coded as regular or irregular based on the patient self-report.

The diagnosis of psychiatric disorders was made in accordance to the Structured Clinical Interview for DSM-IV Axis 1 Disorders (SCID-I). Anxiety and depression were assessed using the Hamilton Anxiety Rating Scale (HAM-A) and the Hamilton Depression Rating Scale (HAM-D), respectively. The Presumptive Stressful Life Events Scale (PSLES) was used to assess stressors in this population.

All the assessments were conducted in a single sitting by one of the investigators. Information was collected primarily from the patients and was supplemented by the data from medical records and other accompanying family members. The study had Institute Ethics Committee approval.

\textbf{Instruments}

SCID-I is a semi-structured interview for making the major DSM-IV Axis I diagnoses.\textsuperscript{[20]} The Clinical Version (SCID-CV) assists in making standardized psychiatric diagnoses using specific probe questions. This interview covers most commonly encountered disorders. The SCID-CV has six self-contained modules covering mood episodes, psychotic symptoms, psychotic disorders, mood disorders, substance use disorders, and anxiety and other disorders. The SCID-CV can be administered to either psychiatric or general medical patients. The interview session takes 45–90 min and has shown good reliability and validity.

PSLES is a scale used to measure stressful life situations.\textsuperscript{[21]} The scale has been validated for the Indian population. It comprises 51 questions and encompasses a variety of stressful life situations. The questionnaire takes about 15 min to administer and had shown good reliability and validity.

HAM-A is a widely used interviewer-rated scale for assessment of anxiety.\textsuperscript{[22]} It consists of 14 items, and the total scores can range from 0 to 56. Higher scores reflect a greater degree of anxiety. The HAM-D is a scale for measuring depression that has been very commonly been used in the published literature.\textsuperscript{[23]} It is a clinician-rated scale that has 17 items. The total scores can range from 0 to 53, and severity of depression can be determined based on the scores.

\textbf{Analysis}

The analysis was conducted using SPSS version 17 (Statistical Software for Social Sciences). Descriptive statistics were used to represent the nominal and continuous data. Frequencies, percentages, means, and standard deviations were used to depict demographic and clinical variables. The cases and NUDs were compared using appropriate parametric and nonparametric tests (\( \chi^2 \)-test, Student’s \( t \)-test or Mann–Whitney U-test). Multivariate logistic regression analysis was conducted to find the independent
predictors of having an SCID-I psychiatric diagnosis in the combined sample of cases and NUDs. The regression analysis was conducted to minimize the effect of confounding variables across the cases and NUDs. For all the inferential statistics, a two-tailed test was used, and a $P < 0.05$ was considered statistically significant.

**RESULTS**

The present study comprised 50 cases of IBS and 50 NUDs. The cases were recruited from 236 screened patients. The most common essential symptoms of IBS in the present sample of cases included abdominal discomfort or pain relieved with defecation ($n = 29$), onset associated with a change in frequency of stools ($n = 25$), and onset associated with a change in the form of stools ($n = 20$). The associated symptoms included abnormal stool form ($n = 42$), abnormal stool frequency ($n = 41$), abnormal stool passage ($n = 40$), bloating sensation ($n = 38$), and passage of mucus ($n = 30$).

The demographic and clinical characteristics of the cases and NUDs are depicted in Table 1. The cases were more likely to be of female gender ($P = 0.012$), married ($P = 0.009$), employed ($P < 0.001$), have irregular meals ($P = 0.003$), and have comparatively longer duration of illness ($P = 0.004$). There were no significant differences in age, education, socioeconomic status, family type, residence, and food habits across the groups.

| Table 1: Demographic and clinical characteristics of the cases and nonulcerative dyspepsias |
|-------------------------------------------------|--------------------------------------------------|---------------------------------------------------|-----------------------------------|
| **Cases (IBS)** $n=50$ (%)                       | **NUDs (NUD)** $n=50$ (%)                        | **Comparison ($P$)**                              |
| Age 28.5 (8.2)                                  | 31.6 (13.4)                                     | $t=1.435$ (0.155)                                |
| Gender                                         |                                                  |                                                  |
| Male                                          | 12 (24)                                        | 24 (48)                                         | $\chi^2=6.250$ (0.012)**          |
| Female gender                                  | 38 (76)                                        | 26 (52)                                         |                                   |
| Marital status                                 |                                                  |                                                  |
| Married                                        | 35 (70)                                        | 22 (44)                                         | $\chi^2=6.895$ (0.009)**          |
| Not currently married                          | 15 (30)                                        | 28 (56)                                         |                                   |
| Education                                      |                                                  |                                                  |
| Illiterate                                     | 11 (22)                                        | 13 (26)                                         | $U=1145$ (0.430)                  |
| Primary                                        | 19 (38)                                        | 17 (34)                                         |                                   |
| Secondary and above                            | 20 (40)                                        | 20 (40)                                         |                                   |
| Occupation                                     |                                                  |                                                  |
| Employed                                       | 38 (76)                                        | 16 (32)                                         | $\chi^2=19.485$ (<0.001)**        |
| Not employed                                    | 12 (24)                                        | 34 (68)                                         |                                   |
| Socioeconomic status                           |                                                  |                                                  |
| Low                                            | 29 (58)                                        | 28 (56)                                         | $U=1237$ (0.918)                  |
| Middle                                         | 18 (36)                                        | 20 (40)                                         |                                   |
| High                                           | 3 (6)                                          | 2 (4)                                           |                                   |
| Family                                         |                                                  |                                                  |
| Nuclear                                        | 28 (56)                                        | 34 (68)                                         | $\chi^2=1.528$ (0.216)           |
| Others                                         | 22 (44)                                        | 16 (32)                                         |                                   |
| Residence                                      |                                                  |                                                  |
| Rural                                          | 29 (58)                                        | 33 (66)                                         | $\chi^2=0.679$ (0.410)           |
| Urban                                          | 21 (42)                                        | 17 (34)                                         |                                   |
| Food habit                                     |                                                  |                                                  |
| Vegetarian                                     | 22 (44)                                        | 16 (32)                                         | $\chi^2=1.528$ (0.216)           |
| Nonvegetarian                                  | 28 (56)                                        | 34 (68)                                         |                                   |
| Meal regularity                                |                                                  |                                                  |
| Regular                                        | 27 (34)                                        | 32 (64)                                         | $\chi^2=9.004$ (0.003)**         |
| Irregular                                      | 34 (68)                                        | 18 (36)                                         |                                   |
| Illness duration (years)                       |                                                  |                                                  |
| 1-5                                           | 33 (66)                                        | 45 (90)                                         | $\chi^2=8.392$ (0.004)**         |
| >5                                            | 17 (34)                                        | 5 (10)                                          |                                   |
| IBS type                                       |                                                  |                                                  |
| Diarrhea-predominant                           | 18 (36)                                        | -                                               |                                   |
| Constipation-predominant                       | 16 (32)                                        | -                                               |                                   |
| Alternating                                    | 16 (32)                                        | -                                               |                                   |

*P<0.05, **P<0.01. IBS – Irritable bowel syndrome; NUDs – Nonulcerative dyspepsias
The psychiatric diagnosis, stressors, and symptoms of anxiety and depression are depicted in Table 2. Psychiatric diagnoses were more common in the IBS group than NUDs ($P < 0.001$). The most common psychiatric diagnosis was major depression, followed by somatization disorder. Having a stressor did not significantly differ between the groups, though family and financial stressors were more common in the cases of IBS. Symptoms of anxiety and depression were more common in the group of patients with IBS than NUDs ($P < 0.001$ for both the symptoms).

To NUD, for the differences between the groups, binary logistic regression analysis was conducted to find the independent predictors of having a psychiatric illness. Age, gender, group status (cases vs. NUDs), presence of stressors, and duration of the illness were used as covariates. The model revealed that having a diagnosis of IBS (odds ratio [OR]: 21.69, 95% confidence intervals [CIs] from 7.14 to 66.67) and increased age (OR: 1.04, CI: 1.04–1.90) were independent predictors of having a psychiatric illness according to SCID. The Nagelkerke $R^2$ of the sample was 0.460, suggesting that the model explained 46% of the variance.

**DISCUSSION**

Demography of the sample points toward preponderance of females in the group of patients with IBS. This is similar with the previous findings of females, being more common among patients with IBS.$^{24}$ The illness duration of the IBS group was longer. The IBS group had a greater proportion of patients who were married and employed, probably reflecting greater adaptation to the chronic illness. The meals were comparatively irregular in patients with IBS, a factor which has been suggested to be associated with exacerbation of symptoms.$^{25,26}$

The present study suggests that IBS is associated with high rates of psychiatric comorbidity. About 88% of the sample had additional diagnosis using SCID, which is in line with some other studies which have found very high rates of psychiatric comorbidity in patients with IBS.$^{10}$ The disorders that were encountered frequently included

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### Table 2: Psychiatric diagnosis, stressors, and symptoms of anxiety and depression

|                              | Cases (IBS) n=50 (%) | NUDs (NUD) n=50 (%) | Comparison ($P$) |
|------------------------------|----------------------|---------------------|------------------|
| **Psychiatric diagnosis**    |                      |                     |                  |
| Major depression             | 16 (32)              | 7 (14)              | $\chi^2=34.766 (<0.001)** |
| Anxiety disorder             | 7 (14)               | 4 (8)               |                  |
| Panic disorder               | 4 (8)                | 0                   |                  |
| Dissociative disorder        | 2 (4)                | 0                   |                  |
| Somatization disorder        | 8 (16)               | 3 (6)               |                  |
| Substance use disorder       | 7 (14)               | 1 (2)               |                  |
| Any psychiatric diagnosis    | 44 (88)              | 15 (30)             |                  |
| None                         | 6 (12)               | 35 (70)             |                  |
| **Stressors**                |                      |                     |                  |
| Family                       | 15 (30)              | 5 (10)              | $\chi^2=3.048 (0.081)$ |
| Financial                    | 11 (22)              | 4 (8)               |                  |
| Occupation                   | 0                    | 3 (6)               |                  |
| Others                       | 0                    | 4 (8)               |                  |
| >1                           | 13 (26)              | 15 (30)             |                  |
| At least one stressor        | 39 (78)              | 31 (62)             |                  |
| None reported                | 11 (22)              | 19 (38)             |                  |
| **Hamilton Anxiety Rating Scale** |                  |                     |                  |
| Normal                       | 0                    | 26 (52)             | $U=166 (<0.001)** |
| Mild                         | 41 (82)              | 20 (40)             |                  |
| Moderate                     | 6 (12)               | 4 (8)               |                  |
| Severe                       | 3 (6)                | 0                   |                  |
| **Hamilton Depression Rating Scale** |              |                     |                  |
| Normal                       | 2 (4)                | 36 (72)             | $U=288 (<0.001)** |
| Mild                         | 16 (32)              | 8 (16)              |                  |
| Moderate                     | 16 (32)              | 4 (8)               |                  |
| Severe                       | 9 (18)               | 2 (4)               |                  |
| Very severe                  | 7 (14)               | 0                   |                  |

**P<0.01, IBS – Irritable bowel syndrome, NUDs – Nonulcerative dyspepsia**
depression, anxiety, somatization disorder, and substance use disorder, which is in agreement with the previous literature.[9,10,12,13] The present study finds that the rates of psychiatric diagnosis were higher than patients with NUD, even after controlling for other variables. Two previous studies, however, did not find differences in psychiatric morbidity between patients with IBS and peptic ulcer disease.[15,27]

Having a stressor did not significantly differ between the groups. Another study has reported similar findings wherein stressful life events were not significantly different between patients with IBS and nonulcer dyspepsia.[27] Studies to the contrary exist suggesting that patients with IBS have been found to have higher stress as compared to NUDs,[18] and life stressors are associated with increased symptoms of IBS.[29] The relationship between stress and symptoms of IBS could be bidirectional with stressors potentially worsening symptoms of IBS and symptoms of gut dysmotility leading to further health-related stress.

Symptoms of anxiety and depression were quite common in the present sample of patients with IBS. All of the patients with IBS had symptoms consistent with mild anxiety, and 96% of the samples had symptoms of at least mild depression in the IBS group. This was far higher than the NUD group with symptoms of at least mild anxiety and depression in 48% and 28% of the samples, respectively. A large proportion of patients with IBS have been observed to have high rates of anxiety and depression symptoms and diagnosis,[17,29] consistent with the present findings. It must be remarked that severe anxiety or depression was uncommon, and most patients had mild to moderate degree of these symptoms.

Many factors can potentially explain the relationship of increased rates of psychiatric illnesses in patients with IBS. First, the gut pathology and the psychiatric symptoms may have a common etiological mechanism. Gut motility is mediated by the enteric nervous system which has intricate links with the central nervous system. Hence, it is possible that biological vulnerabilities for psychiatric disorders due to their impact on CNS may also be associated with gut dysmotility which manifests as IBS. Second, a pattern of psychological processes which include obsessionality and anxious preoccupation about health may predispose an individual to develop IBS subsequently. Third, symptoms of IBS may impair the work performance of the individual, leading to invalidism and subsequently leading to anxiety and depressive disorders. Probably, all the three mechanisms have a role and have been discussed in reviews elsewhere.[30-32]

The strengths of the study include using a comparison group to represent the rates of psychiatric disorders in context, systematic assessment for psychiatric disorders using a structured diagnostic instrument, and using patient population from a tertiary care hospital where the diagnosis of IBS is likely to be more confident based on available investigations. Some limitations of the present study should also be considered while drawing interpretations. The present study was conducted among a limited sample of participants. The case NUD design compared only with one group of NUDs, and healthy “normal” NUDs were not recruited. The study reflects findings of a single center, and generalization to other centers or community requires caution. Personality factors, health-care-seeking patterns, cultural beliefs, explanations of the illness, coping, quality of life measures, and dysfunction are other related variables that were not systematically assessed in the present study and may have implications on the presentation and management of the disorder. The authors had to restrict the number of determinants studied to elicit the adequate cooperation of the patients and complete assessments without dropouts during multisession assessments.

CONCLUSION

The present study adds to the limited literature of psychiatric comorbidity in patients with IBS in the South Asian region. High rates of psychiatric comorbidity were encountered though stressors were not significantly higher than NUDs. Anxiety and depressive symptoms were higher in cases than NUDs. Further studies are required to systematically assess the impact of prompt assessment and management of psychiatric disorder in patients with IBS on the quality of life and general level of functioning.

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Conflicts of interest
There are no conflicts of interest.

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