



RESEARCH ARTICLE

A STUDY OF PREVALENCE OF STRESS RELATED FUNCTIONAL GASTROINTESTINAL DISORDERS
IN URBAN / RURAL CIVILIAN POPULATION AND PARAMILITARY POPULATION
IN KASHMIR VALLEY

*¹Shameem Iqbal, ²Tariq Abdullah Mir, ³Asif Iqbal, ⁴Malik, G. M. and ⁵Nuzhat

¹Consultant Cardiologist, MMABM Hospital, Anantnag

²Consultant Physician, MMABM Hospital, Anantnag

³Consultant Gastroenterologist, GMC and associated Hospitals, Srinagar.

⁴Ex-Professor, Medicine, GMC and associated Hospitals, Srinagar.

⁵Medical Officer, Health and Medical Education, J&K

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ABSTRACT

Background: The functional gastrointestinal disorders (EGID) are the most common condition seen in gastroenterology clinics and they constitute a significant number of primary case visits. FGID symptoms are common in the community, only a small percentage seeks medical attention. The psychosocial factors which play a crucial role in FGID are acute chronic stress, personality structure and coping skills.

Objectives: To determine the prevalence of symptoms of chronic functional gastrointestinal disorders. **Methodology:** A population sample of 500 was taken from each of the six districts of Kashmir valley. An effort was made to keep the population sample similar with respect to age, gender, educational background, smoking, alcohol consumption history of NSAID intake and past history of medical / psychiatric problem. An aliquot of subjects fulfilling the criteria for functional gastrointestinal disorders but with any alarming sign / symptom of bleeding PR, nocturnal pain and / or loss of appetite in any age group but especially in the elderly age group were taken for detailed clinical examination and the following relevant investigations.

Results: The difference in the age (years) was statistically non-significant. There was a non-significant difference in distribution of sex in six districts. The prevalence of all functional G.I. symptoms except excessive gas / bloating was higher in females than in males. In Kashmir valley, 20.3% of study population was having abdominal pain before 1990 while as it was present in 48.2% after 1990. Loose water stool recorded an increase from 3.75 to 9.4% which is statistically significant. Although Nausea / Vomiting also increased from 9.2% to 11.6% but the difference was statistically not significant.

Conclusion: We observed sudden clustering of various functional gastrointestinal and non-gastrointestinal symptomatology among the inhabitants of the valley and the paramilitary personnel deployed in this region during this period of turmoil.

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INTRODUCTION

The Psychiatric and psychological connection to gastrointestinal diseases have a rich history that continues to evolve as knowledge accumulates about both medical and psychiatric contributions to disease. The functional gastrointestinal disorders (EGID) are the most common condition seen in gastroenterology clinics and they constitute a significant number of primary case visits. FGID symptoms are

common in the community, only a small percentage seeks medical attention. The psychosocial factors which play a crucial role in FGID are acute chronic stress, personality structure and coping skills (Budavari and Olden, 2003). Psychosocial factors influence gut physiology, symptom experience, health behaviour and outcome. The varied influences of environmental stress, thought and emotions on gut function help explain the variation in symptoms of patients with these disorders (Drossman et al., 1999). A variety of stressors play a role in the development of functional gastrointestinal disorders. Stress is defined as an acute threat to the homeostasis of an organism real (physical) or perceived

*Corresponding author: Shameem Iqbal,
Consultant Cardiologist, MMABM Hospital, Anantnag

(psychological). It is posed by events in the outside world or from within, which in turn evokes adaptive responses to defend the stability of internal environment and besides ensures the survival of the organism (Mayer *et al.*, 2001). Different types of stressors play a role in (i) permanent enhancement of stress responsiveness (pathological stress) (ii) transient symptom exacerbation and (iii) symptom perpetuation (symptom generated stress). Acute, life threatening stress episodes in adult life are important risk factors in the development of functional gastrointestinal disorders. In the genetically predisposed individual, severe life threatening stress can result in permanent increase in the responsiveness of central stress circuits and therefore susceptibility to development of functional disorders later in life. Psychosocial stressors in the form of sustained, life threatening events have been associated with onset and symptom exacerbation in irritable bowel syndrome (IBS) (Mayer *et al.*, 2001). There is a well recognized association between emotional psychological factors and gut function. Marked changes in the large bowel were observed in medical students with alteration in rectal erythema when acute emotional stress was induced. These studies in animals and human have established a direct link between acute emotional changes and control of functional (Emmanuel *et al.*, 2001). Functional gastrointestinal disorders comprise a variety of symptom complexes that have been divided into either the presumed organ of origin or the separate category of abdominal pain. Of these disorders, the most common are irritable bowel syndrome (IBS) and functional dyspepsia. In these two disorders the most commonly and/ or bloating (Agreus *et al.*, 1994). Evidence exists to suggest that psychological can produce a heightened awareness of somatic symptoms arising from the gut. Investigators from Barcelona have shown that mental attention focused on the stomach increased the perception of gastric distension. Similarly focus of attention could be provided by the association of gastrointestinal illness with psychological stress. Thus if psychological stress is ongoing, the bowel symptoms persist and come to represent the emotional (Gwee *et al.*, 1999). One population study examined the prevalence of current gastrointestinal symptoms (pain, distension and altered stool consistency) and found that 54% of men and 66% of women had two or more abdominal symptoms in the past year (Brown *et al.*, 2003). Our aim of this study was to determine the prevalence of symptoms of chronic functional gastrointestinal disorders in this community and the paramilitary deployed in this region and to study whether there has been a change in the prevalence of this symptomatology because of the ongoing turmoil and its resultant stress.

MATERIALS AND METHODS

The study was conducted in the Department of Medicine, SMHS Hospital, an associated hospital of Government Medical College, Srinagar, and which is a tertiary care hospital. A population sample of 500 was taken from each of the six districts of Kashmir valley. An effort was made to keep the population sample similar with respect to age, gender, educational background, smoking, alcohol consumption history of NSAID intake and past history of medical / psychiatric problem. In all, therefore the civilian population taken up for the study was 3000. In addition a sample of 1000 was taken from the paramilitary personnel deployed in the valley. The total population sample studied therefore was 4000. The selection of the subjects was done by simple random sampling, the age of the subjects enrolled for the study was 25-

65 years. Subjects with already diagnosed structural gastrointestinal disease were excluded from the study. All the subjects were asked to fill in a questionnaire. For the civilian population, the questionnaire was in two parts. In the first part all the participants were asked to recall the occurrence of common gastrointestinal symptoms experienced before the start of turmoil in Kashmir valley. In the second section the participants were asked to rate the frequency of occurrence of 16 gastrointestinal symptoms experienced at the time of survey. Furthermore, the frequency of 6 non-gastrointestinal symptoms was also compared before and after the start of turmoil. In addition, information regarding number of crack-downs faced per year and the total number of violent episode witnessed over last 15 years by each individual was noted. For the 1000 paramilitary personnel selected for the study, the questionnaire was also in two parts. In the first part, they were asked to recall the occurrence of 5 common gastrointestinal symptoms before deployment in valley and in the second part were asked to rate the frequency of occurrence of 16 gastrointestinal symptoms after deployment in the valley. Also, the frequency of 6 non-gastrointestinal symptoms was compared before and after deployment in the valley. In addition, information regarding the time since being posted in the valley, the number of times in bunkers / tents, the number of times posted in border areas was noted. Data was analysed statistically and significance derived. An aliquot of subjects fulfilling the criteria for functional gastrointestinal disorders but with any alarming sign / symptom of bleeding PR, nocturnal pain and / or loss of appetite in any age group but especially in the elderly age group were taken for detailed clinical examination and the following relevant investigations (if needed).

- CBC / Stool Examination
- UGI / LGI Endoscopy
- USG abdomen
- Barium Study to exclude organic disease.

Statistical analysis

The statistical analysis of the data was done by using test statistic student's t-test for differences of means and chi-square test (χ^2 test). The analysis of variance (ANOVA) was worked out for more than two mean comparisons. These tests were further referred for p-values for their significances of insignificance. The analysis of the data was performed by using comprehensive statistical software i.e. statistical Software for Social Sciences (SPSS ver. 20.0), Chicago, U.S.A. for windows.

RESULTS

The age in years were distributed as (mean \pm SD). It was (36.12 \pm 7.48), (35.81 \pm 6.18), (39.35 \pm 5.13), (38.17 \pm 4.25) and (40.10 \pm 4.28) in district Anantang, Baramulla, Budgam, Kupwara, Pulwama and Srinagar respectively. The difference in the age (years) was statistically non-significant. There was a non-significant difference in distribution of sex in six districts. The prevalence of all functional G.I. symptoms except excessive gas / bloating was higher in females than in males before 1990. The prevalence of all functional non-G.I. symptoms before 1990 was higher in females than males. The prevalence of IBS (using Manning Criteria) in the valley = 24.9%. The prevalence of all the functional G.I. symptoms

except excessive gas / bloating was higher in females than males at the time of survey. The prevalence of the five common functional G.I. symptoms was highest in the age group 25-35 years at the time of survey. The prevalence of the non-G.I. symptoms except cough was higher in females than males at the time of survey. In Kashmir valley, 20.3% of study population was having abdominal pain before 1990 while as it was present in 48.2% after 1990. There was a significant increase in abdominal pain and the difference was statistically highly significant (0.000). Excessive gas/bloating increased from 21.9% to 33% and the difference was statistically highly significant. More than 3 bowel movement per day increased from 7.8% to 20.4% of the study population which was statistically highly significant. Loose watery stool recorded an increase from 3.75 to 9.4% which is statistically significant. Although Nausea / Vomiting also increased from 9.2% to 11.6% but the difference was statistically not significant. In the valley, 9.9% of the study population was having Chronic fatigue before 1990 while as it was present in 30.6% at the time of survey.

The difference was statistically highly significant. Joint pains increased from 4.2% to 11.4% and the difference was highly significant. Headache and Sleep disturbances increased from 9.8% and 5.7% to 19.3% and 16.6% respectively and the differences were highly significant. No statistical increase in Skin rash and Cough was observed. The comparison of various G.I. and non-G.I. symptoms before 1990 and at the time of survey in six different districts of Kashmir valley; there is a statistically significant increase in G.I. symptoms viz Abdominal pain, excessive gas / bloating, bowel movements per day, loose watery stools in each district. While as statistically non-significant difference was observed in Nausea/Vomiting. In non-G.I. symptoms, Chronic fatigue, joint pain, headache and sleep disturbances showed a statistically significant increase in each district.

Statistically significant difference in abdominal pain, excessive gas / bloating, loose watery stools, mucus with stools and incomplete rectal evacuation was observed on comparing Kupwara with Anantnag. Statistically no significant differences are observed in various non-G.I. symptoms between Kupwara and Anantnag at the time of survey. Significant differences were observed statistically on comparing symptoms of abdominal pain, excessive gas / bloating, loose watery stools and incomplete rectal evacuation between Kupwara and Baramulla. No statistically significant difference observed in various non-G.I. symptoms between Kupwara and Baramulla. Statistically significant difference were observed in abdominal pain, excessive gas / bloating, > 3 bowel movement per day, loose watery stools, mucus with stools and incomplete rectal evacuation on comparing Kupwara with Budgam. Statistically significant difference observed in non-G.I. symptoms of chronic fatigue, joint pains, headache and sleep disturbances. On comparing Kupwara with Pulwama, statistically significant difference were observed in symptoms of abdominal pain, excessive gas / bloating, loose watery stools, mucus with stools and incomplete rectal evacuation. Statistically no significant difference between non - G.I. Symptoms. On comparing Kupwara with Srinagar statistically significant difference were observed in G.I. Symptoms of abdominal pain, excessive gas, loose watery stools, mucus with stools and incomplete rectal evacuation. Statistically no significant differences were observed in non G.I. Symptoms on comparing Kupwara with Srinagar.

Violent Episodes are the event which include witnessing bomb-blasts, mine blasts, grenade attacks, firings, suicide bombing, killings, house gutting etc. 30% of study population in Kupwara witnessed more than 5 violent episodes during the period of turmoil while only 18.8% of the study population witnessed more than 5 violent episodes in Budgam.

Crack-down is a search operation conducted by various security agencies during which a particular area is cordoned-off and the residents are ordered to come out of their houses and assemble and meanwhile their houses are searched. This whole process may take 6 – 18 hours. 74.6% of the study population in Kupwara faced more than 2 crack downs per year, while as only 50.4% of the study population in Budgam faced more than 2 crack downs per year. The prevalence of the five most common G.I. symptoms abdominal pain, excessive gas / bloating, nausea / vomiting, > 3 bowel movements per day, loose watery stools was highest in the age group 25 – 34 years. Statistically significant difference was observed in all the G.I. symptoms except Nausea / Vomiting which had a statistically significant increase. Statistically significant difference were observed in symptoms of abdominal pain, excessive gas / bloating, > 3 bowel movement / day, incomplete rectal evacuation posted in border area compared to those posted in non-border area. Chronic fatigue, joint pain and sleep disturbances are statistically significant in paramilitary forces posted in border area when compared when compared to those posted in non-border area. A statistically significant difference was observed in the G.I. symptoms viz. abdominal pain, excessive gas, > 3 bowel movements / day, loose watery stools and incomplete rectal evacuation when comparing paramilitary personnel posted > 2 years in valley. Similarly a statistically significant difference was observed in the G.I. symptoms viz. Chronic fatigue, joint pain, headache, sleep disturbances of paramilitary forces with those posted < 2 years in valley.

No difference was observed in the two variables of:

Number of times posted in Bunkers / Tents

Duration of duty hours in Bunkers

On average a paramilitary personnel has a duty duration of 8 hours out of 24 hours in Bunkers with shifts of 2 to 4 hours.

A total 235 subjects were taken for further investigations and only 120 responded with an overall response rate of 51%.

DISCUSSION

We took a sample of 3000 civilian population with 500 from each district of the valley and another sample of 1000 paramilitary personnel deployed in this region. As far as the age distribution is concerned, we found that at the time of survey, the prevalence of the symptoms of FGID was highest in the age group 25 – 34 which is consistent with other studies. Rh Jones *et al.* (1990) reported that gastrointestinal symptoms frequency falls progressively with age both in men and women. Agreus *et al.* (1994) reported that prevalence rate of most abdominal symptoms with the exception of reflux symptoms and night pains decreased with age implying that most of the complaints were of functional origin. Regarding sex distribution, our study all the functional gastrointestinal symptoms were reported higher in females than males except excessive gas / bloating which is consistent with other studies. Carol S. North *et al.* (1996) revealed that women in community reported more functional gastrointestinal complaints than men. Kenneth *et al.*

(Heaton *et al.*, 1992) reported that in British Urban Community one or more gastrointestinal symptoms occurred frequently in 47% of Women and 27% of men. The overall prevalence of IBS (using Manning Criteria) in the valley was reported as 24.9%. There has been a marked increase in the prevalence of the gastrointestinal symptoms in the valley after the onset of turmoil. All of these statistically significant gastrointestinal symptoms were among the symptoms which were reported higher in Persian Gulf veterans who were deployed in the Gulf region during Gulf War (Sostek *et al.*, 1996). Similarly higher prevalence of these symptoms was reported in holocaust survivors (Stermer *et al.*, 1991). A 1989 Mayo clinic study (Talley *et al.*, 1989) used a self-report questionnaire to determine symptoms that best discriminated functional bowel disease. All of the above symptoms were considerably more prevalent in patients with functional as opposed to organic gastrointestinal disease. The increase in the functional gastrointestinal symptomatology due to turmoil related stress which we have observed in our study is consistent with other studies which have linked stressful life events strongly with functional gastrointestinal disorders. D.A. Drossman *et al.* (1999) reported that severe life stress has been found immediately before the onset of FGID and social stress plays an important part in explaining exacerbation of symptoms and treatment seeking. Emeran A. Mayer *et al.* (2001) reported that psychosocial stressors in the form of sustained, threatening life event have been associated with onset symptom exacerbation in IBS.

Among the functional non-gastrointestinal complaints, chronic fatigue, joint pains, headache and sleep disturbances had a statistically significant increase after the onset of turmoil pains from 4.2 % to 11.4% (p value 0.00), headache from 9.9% to 30.6% (p value 0.00), joint pains from 9.8% to 19.3% (p value 0.00) and sleep disturbances from 5.7% to 16.6% (p value 0.00). William H. Brown *et al.* (2003) reported that patients with functional gastrointestinal disorders have a significantly greater number of gastrointestinal and non-gastrointestinal symptoms on review of symptoms. If seven positive systems is used, the standardized review of systems questionnaire has a sensitivity of 92% and a specificity of 80% in detecting patients with functional gastrointestinal disorders. A recent study involving primary care physicians from UK reported that IBS patients are more likely to have 'unexplained symptoms' and to be polysymptomatic than those with organic disease. The percentage of functional non-gastrointestinal symptoms was higher in district Kupwara compared to all districts and the difference was statistically significant difference was observed in the functional non-gastrointestinal symptoms of chronic fatigue (Kupwara 33.8% vs Budgam 26.4% p value < 0.05), joint pains (Kupwara 14.2% vs Budgam 9.4% p value < 0.05), headache (Kupwara 23% vs Budgam 17%. P value < 0.05) and sleep disturbances (Kupwara 20% vs Budgam 14.2% p value < 0.05). This is consistent with other studies (Budavari and Olden, 2003; Mayer *et al.*, 2001; Bennet *et al.*, 1991; Vishnar *et al.*, 1999; Haug *et al.*, 2002) which link higher number of anxiety provoking situations and / or undesirable life event to symptom onset and exacerbation in various functional gastrointestinal disorders.

Chronic fatigue increased from 16.6% to 45.3% (p value 0.00 Highly Significant), headache (13.3% to 19.7% p value 0.00); joint pains (19.7% to 24.7% p value 0.00), sleep disturbances (17.1% to 31.8% p value 0.00). Similar significant increases in the prevalence of functional non-gastrointestinal symptoms

was reported by Sostek *et al.* (1996) in Persian Gulf veterans. Since limited evaluation was done to exclude structural diagnosis, some may argue that our findings may over represent the frequency of symptoms of functional gastrointestinal disorders. This seems unlikely because we eliminated persons reported structural disease that could explain their symptoms from our study. Further, in a non-clinical sample functional gastrointestinal disorders are likely to be much more frequent than structural diagnosis (Drossman *et al.*, 1993).

Conclusion

We observed sudden clustering of various functional gastrointestinal and non-gastrointestinal symptomatology among the inhabitants of the valley and the paramilitary personnel deployed in this region during this period of turmoil. So we coin the term "Kashmir – turmoil syndrome" to explain this symptom complex, the way terms Persian Gulf syndrome "survivor Syndrome" etc. have been used.

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