

# FREQUENCY OF IRRITABLE BOWEL SYNDROME IN ADOLESCENTS WITH DEPRESSION: AN EXPERIENCE IN A TERTIARY CARE HOSPITAL

Muhammad Waqas<sup>1</sup>, Nauman Wazir<sup>2</sup>, Salma Zeb<sup>3</sup>, Muhammad Iqbal<sup>4</sup>

<sup>1-3</sup> Department of Medicine, Lady Reading Hospital, Peshawar - Pakistan.

<sup>4</sup> Department of Psychiatry, Lady Reading Hospital, Peshawar - Pakistan.

**Address for correspondence:**

**Dr. Muhammad Waqas**

Department of Medicine, Lady Reading Hospital, Peshawar - Pakistan.

Email: drwaqas87@gmail.com

Date Received:

May 11, 2016

Date Revised:

June 28, 2016

Date Accepted:

July 14, 2016

## ABSTRACT

**Objective:** To determine the frequency of IBS in depressed adolescent patients.

**Methodology:** The study, designed as a cross-sectional, was performed in a consecutive sample of adolescents diagnosed with depression in the Department of Medicine, Lady Reading Hospital, Peshawar, Pakistan. Frequency of IBS in depressed adolescents was found using the Rome III criteria.

**Results:** Among 162 depressed adolescents, 73(45%) were male and 89(55%) were female. Overall 24(14.81%) of adolescents diagnosed with depression were having IBS. Among 162 adolescents, 49(30%) were having mild depression, of which 4(8.16%) were having IBS; 70(43%) were having moderate depression, of which 9(12.85%) were having IBS; 36(22%) were having moderate severe depression, of which 7(19.44%) were having IBS; 8(5%) were having severe depression, of which 4(50%) were having IBS.

**Conclusion:** There was a high frequency of IBS in depressed adolescents and its frequency increased with the level of depression.

**Key Words:** Irritable bowel syndrome, Adolescents, Depression

This article may be cited as: Waqas M, Wazir N, Zeb S, Iqbal M. Frequency of irritable bowel syndrome in adolescents with depression: An experience in a tertiary care hospital. *J Postgrad Med Inst* 2016; 30(3): 263-7.

## INTRODUCTION

The period that is transitional between childhood and adulthood is termed as adolescence. Various life stressors and biological changes are presents at this stage of life. Attending college/university, meeting academic demands, experiencing changes in social life, being separated from the family, and in the low socioeconomic stratum experiencing economic difficulties and responsibilities for the first time, may add additional stress and increased the psychosocial problems of adolescents<sup>1</sup>. Adolescents are usually emotionally vulnerable which contributes to psychological disorders in this age stratum<sup>1-3</sup>.

Irritable bowel syndromes (IBS) is a relatively common functional gastrointestinal disorder (FGID), which is characterized by chronic, relapsing abdominal pains or discomfort, abdominal distensions and changes in bowel habits without and organic cause<sup>4-6</sup>. The prevalence of IBS in western countries is around 15-24%<sup>7-8</sup>, whereas in Asia it is 5-10%<sup>9</sup>. The etiology of IBS, until now, is incompletely understood, but is thought to be multifactorial, including abnormal regulation of the brain-gut axis involving both central and peripheral mechanisms<sup>10</sup>. It has been shown certain psychological

factors, such as anxiety and depression, are associated with the onset and course of IBS<sup>11</sup>. IBS is mores common in patients with depressive symptoms and anxiety disorders<sup>12,13</sup>. In fact it has been demonstrated that there is a bi-directional relationships between depression/anxiety and IBS via the brain-gut axis<sup>14</sup>.

Worldwide adolescent IBS studies are scarce. The prevalence of adolescent IBS in different studies varies from 34.7-434%<sup>11,15-22</sup>. As in adults, depression has been shown to be associated with IBS in adolescents<sup>19,21,22</sup>. Comorbid depression and anxiety are commons to both IBS and in adolescence<sup>13,23</sup>. It is known that adolescent depression persists into adulthood<sup>24,25</sup>. The close associations of depression with IBS and the continuances of adolescents depression into adulthood mighty helps to produce treatment opportunities by using behavioral approaches/interventions.

Our study is focused to determine the frequency of irritable bowel syndrome in adolescents presenting with depression. This would aid in timely diagnosis and early treatment of comorbid IBS. Early treatment will reduce the economic burden of illness characterized by impaired health-related quality of life (HR QoL). The data is intended to be disseminated amongst health professionals for future research to evolve new strategies for

effective management of IBS in adolescents with depression.

### METHODOLOGY

The study was conducted at the Department of Medicine, Lady Reading Hospital, Peshawar, Pakistan over a period of one year from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2014. Consecutive patients between 13 and 19 years of age, consisting of both gender, having symptoms of depression were included in the study. Depression was assessed using patients health questionnaire-9 (PHQ-9). PHQ-9 is a 9 items tool for diagnosing and assessing the severity of depression in adolescents. It is derived from Diagnostic and Statistical Manual (DSM-IV) and its validity and reliability has been tested<sup>26</sup>. A total of 186 adolescents were found to be depressed, out of which 26 patients met the exclusion criteria of the study (given as under), and the remaining 162 patients were assessed for having irritable bowel syndrome.

These 162 patients were those who had symptoms of depression and were diagnosed as having depression using PHQ-9 questionnaire which was translated verbally for each patient in their mother tongue. All those individuals who scored 5 or more out of the total score of 27 on PHQ-9 were diagnosed as depressed. Individuals with scores of 5-9 were categorized as having mild depression, those with scores 10-14 as having moderate depression, those with scores ranging from 15 to 19 as moderately severe depression and those with scores 20 or more as severe depression. Irritable bowel syndrome was assessed using Rome III criteria amongst the depressed patients. Patients were assessed with the Rome III criteria IBS module questionnaire<sup>27</sup>, which was verbally translated in their mother tongue, for irritable bowel syndrome. Exclusion criteria consisted of presence of red flag symptoms (weight loss, blood in stools, nocturnal symptoms, any family history of GI malignancy, feeling of lump in epigastrium, persistent vomiting), diagnosed inflammatory bowel disease, malabsorption syndrome, diagnosed/clinically suspected infective diarrhea, and patients not giving consent. Data was entered through the performa attached.

### RESULTS

A total of 162 depressed adolescents were studied. Age wise distribution showed that among 162 adolescents, 45(28%) were in the age range of 13-15 years, while 117(72%) adolescents were in age range 16-19 years. Mean age was 17±1.28 years. A total of 73(45%) adolescents were male and 89(55%) were female. Among 162 adolescents a total of 24(14.81%) patients were suffering from IBS. Amongst male and female patients 9(12.32%) and 15(14.60%) were having IBS, respectively. Amongst 162 adolescents 49(30%) were having mild depression, of which 4(8.16%) were having IBS; 70(43%) were having moderate depression, of which 9(12.85%) were having IBS; 36(22%) were having moderate severe depression, of which 7(19.44%) were having IBS; and 8(5%) were severe depression, of which 4(50%) were having IBS. The demographics and clinical features of all the study subjects are summarized in table 1.

### DISCUSSION

Among IBS studies, adolescent IBS studies are uncommon worldwide. The prevalence of adolescent IBS varies from 34.7-53.4%<sup>11,15-22</sup>. Our study showed that the prevalence of IBS amongst the depressed adolescents was 14.81%. In different studies, the prevalence of IBS in adolescents is varied from 4.7-34%<sup>11,15-22</sup>. In Chinese college going students it was 7.85%<sup>20</sup>, 31.8% in medical students of Jeddah (Saudi Arabia) and 34% in a study conducted in adolescent and young college going students of Karachi, Pakistan<sup>28</sup>. The wide variation of IBS in adolescents in different communities and regions could be attributed to various factors. Among them is the degree of stress, dietary habits, living in metropolitan cities and the cultural and social structure of the society. For example, it was high in medical students of Jeddah (having stress of tough academic demands) and in adolescents of metropolitan city of Karachi, and low in China, a country where considerably healthier dietary habits prevail.

Our study centered on adolescents with depres-

**Table 1: Demographic and clinical characteristics of the study population**

Depressed Adolescents	Frequency	Frequency of IBS
Gender		
Male	73(45%)	9(12.32%)
Female	89(55%)	15(14.60%)
Grades of Depression		
Mild Depression	49	4(8.16%)
Moderate Depression	70	9(12.85%)
Moderate Severe Depression	36	7(19.44%)
Severe Depression	8	4(50%)

sion. Of interest is the fact that frequency of IBS increased with the level of depression as measured by the PHQ-9 questionnaire. Among various theories that could explain the etiology of IBS, the brain-gut theory has received considerable interest, according to which depression and IBS may share same neurobiochemical mechanisms regulating both mood and brain-guts interactions<sup>11</sup>. A recent research gave the first direct evidence to demonstrate that the brain-gut pathway is bidirectional, which means both brain-gut and gut-brain dysfunction may be of worthwhile occurrence in patients of IBS<sup>29</sup>. Keeping the brain-gut dysfunction in view, a study showed that patients with current IBS, 427.5% also had a current psychiatric mood or anxiety disorder (OR = 2.62), and among-lifetime IBS, 50.5% also had a lifetime psychiatric condition (OR = 2.12)<sup>30</sup>. Studies showed that almost 30% of patients with major depression have met the criteria for IBS, almost 3–10 times as high as for controls patients without depression<sup>31,32</sup>. Conversely, patients with major depression, dysthymia, schizophrenia, panic and anxiety disorders have shown a high prevalence of IBS<sup>33</sup>. A similar association has been shown in adolescent psychiatric patients in a recent study which demonstrated that approximate prevalence of IBS was found to be 19% in schizophrenia, 29% in depression, and 46% in panic disorder<sup>34</sup>. A local study done in Karachi showed that students with various kinds of mental stress and depression were more prone to developing IBS<sup>35</sup>.

The relatively low frequency of IBS in adolescents in our study, despite of being at a greater risk (being depressed), as compared to that in the western studies and in other parts of the same country suggests that the rich traditional values, social and family support in the culture of this particular area does affect this association of depression. Nevertheless, the interesting fact shown by our data is that the prevalence of IBS increased with the increased level of depression as determined by the PHQ-9 questionnaire; 50% in severe depression.

The prevalence of IBS in our study was more in females than in males. This finding appears to support the results of previous fairly strong association between female gender and IBS<sup>6,20,36-38</sup>. Results of a systematic review from Iran in 2012<sup>38</sup> showed that more than half of the reviewed studies demonstrated a statistically significant correlation of IBS with the female gender. Most studies have shown females genders to be associated with IBS in adolescents, as in adults<sup>15-22</sup>. Numerous explanations from hormone-related differences to lower pain threshold in females, have been suggested for this variation<sup>39,40</sup>.

## LIMITATIONS

Other factors that could influence the occurrence of IBS, but not taken specifically as separate strata in

this study, would have been the level of education and socio-economic class, and this is the most important weakness of our study. Further research, incorporating these as well as other possible factors and analytical rather than descriptive studies done locally could give a better insight into this area.

## CONCLUSION

There was a high frequency of IBS in depressed adolescents and its frequency increased with the level of depression.

## REFERENCES

1. Bayram N, Bilgel N. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Soc Psychiatry Psychiatr Epidemiol* 2008; 43:667-72.
2. Arslan G, Ayranci U, Unsal A, Arslantas D. Prevalence of depression, its correlates among students, and its effect on health-related quality of life in a Turkish university. *Ups J Med Sci* 2009; 114:170-7.
3. Ozen NS, Ercan I, Irgil E, Sigirli D. Anxiety prevalence and affecting factors among university students. *Asia Pac J Public Health* 2010; 22:127-33.
4. Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional bowel disorders. *Gastroenterology* 2006; 130:1480-91.
5. Spiller R, Aziz Q, Creed F, Emmanuel A, Houghton L, Hugin P et al. Guidelines on the irritable bowel syndrome: mechanisms and practical management. *Gut* 2007; 56:1770-98.
6. Song SW, Park SJ, Kim SH, Kang SG. Relationship between irritable bowel syndrome, worry and stress in adolescent girls. *J Korean Med Sci* 2012; 27: 1398-404.
7. Agréus L, Svärdsudd K, Nyrén O, Tibblin G. Irritable bowel syndrome and dyspepsia in the general population: overlap and lack of stability over time. *Gastroenterology* 1995; 109:671-80.
8. Frank L, Kleinman L, Rentz A, Ciesla G, Kim JJ, Zacker C. Health-related quality of life associated with irritable bowel syndrome: comparison with other chronic diseases. *ClinTher* 2002; 24:675-89.
9. Chang FY, Lu CL. Irritable bowel syndrome in the 21st century: perspectives from Asia or South-east Asia. *J Gastroenterol Hepatol* 2007; 22:4-12.
10. Barbara G, De Giorgio R, Stanghellini V, Cremon C, Salvioli B, Corinaldesi R. New pathophysiological mechanisms in irritable bowel syndrome. *Aliment Pharmacol Ther* 2004; 20:1-9.
11. Gulewitsch MD, Enck P, Hautzinger M, Schlarb AA. Irritable bowel syndrome symptoms among German students: prevalence, characteristics, and associations to somatic

- complaints, sleep, quality of life, and childhood abdominal pain. *Eur J Gastroenterol Hepatol* 2011; 23:311-6.
12. Lee S, Wu J, Ma YL, Tsang A, Guo WJ, Sung J. Irritable bowel syndrome is strongly associated with generalized anxiety disorder: a community study. *Aliment Pharmacol Ther* 2009; 30:643-51.
  13. Hillilä MT, Hämäläinen J, Heikkinen ME, Färkkilä MA. Gastrointestinal complaints among subjects with depressive symptoms in the general population. *Aliment Pharmacol Ther* 2008; 28:648-54.
  14. Fichna J, Storr MA. Brain-gut interactions in IBS. *Front Pharmacol* 2012; 3: 127.
  15. Dai N, Cong Y, Yuan H. Prevalence of irritable bowel syndrome among undergraduates in Southeast China. *Dig Liver Dis* 2008; 40:418-24.
  16. Shiotani A, Miyanishi T, Takahashi T. Sex differences in irritable bowel syndrome in Japanese university students. *J Gastroenterol* 2006; 41:562-8.
  17. Hazlett-Stevens H, Craske MG, Mayer EA, Chang L, Naliboff BD. Prevalence of irritable bowel syndrome among university students: the roles of worry, neuroticism, anxiety sensitivity and visceral anxiety. *J Psychosom Res* 2003; 55: 501-5.
  18. Kim YJ, Ban DJ. Prevalence of irritable bowel syndrome, influence of lifestyle factors and bowel habits in Korean college students. *Int J Nurs Stud* 2005; 42: 247-54.
  19. Tan YM, Goh KL, Muhidayah R, Ooi CL, Salem O. Prevalence of irritable bowel syndrome in young adult Malaysians: a survey among medical students. *J Gastroenterol Hepatol* 2003; 18:1412-6.
  20. Dong YY, Zuo XL, Li CQ, Yu YB, Zhao QJ, Li YQ. Prevalence of irritable bowel syndrome in Chinese college and university students assessed using Rome III criteria. *World J Gastroenterol* 2010; 16:4221-6.
  21. Zhou H, Yao M, Cheng GY, Chen YP, Li DG. Prevalence and associated factors of functional gastrointestinal disorders and bowel habits in Chinese adolescents: a school-based study. *J Pediatr Gastroenterol Nutr* 2011; 53:168-73.
  22. Son YJ, Jun EY, Park JH. Prevalence and risk factors of irritable bowel syndrome in Korean adolescent girls: a school-based study. *Int J Nurs Stud* 2009; 46:76-84.
  23. Thijssen AY, Jonkers DM, Leue C, van der Veek PP, Vidakovic-Vukic M, van Rood YR et al. Dysfunctional cognitions, anxiety and depression in irritable bowel syndrome. *J Clin Gastroenterol* 2010; 44:e236-41.
  24. Pine DS, Cohen P, Gurley D, Brook J, Ma Y. The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Arch Gen Psychiatry* 1998; 55:56-64.
  25. Fichter MM, Kohlboeck G, Quadflieg N, Wyschkon A, Esser G. From childhood to adult age: 18-year longitudinal results and prediction of the course of mental disorders in the community. *Soc Psychiatry Psychiatr Epidemiol* 2009; 44:792-803.
  26. Richardson LP, McCauley E, Grossman DC, McCarty CA, Richards J, Russo JE, et al. Evaluation of the Patient Health Questionnaire-9 Item for detecting major depression among adolescents. *Pediatrics* 2010;126:1117-23.
  27. Engsbro AL, Begtrup LM, Kjeldsen J, Larsen PV, de Muckadell OS, Jarbol DE, et al. Patients suspected of irritable bowel syndrome: cross-sectional study exploring the sensitivity of Rome III criteria in primary care. *Am J Gastroenterol* 2013; 108:972-80.
  28. Jafri W, Yakoob J, Jafri N, Islam M, Ali QM. "Frequency of irritable bowel syndrome in college students,". *J Ayub Med Coll* 2005; 17:9-11.
  29. Koloski NA, Jones M, Kalantar J, Weltman M, Zaguirre J, Talley NJ. The brain-gut pathway in functional gastrointestinal disorders is bidirectional: a 12-year prospective population-based study. *Gut* 2012; 61:1284-90.
  30. Mykletun A, Jacka F, Williams L, Pasco J, Henry M, Nicholson GC et al. Prevalence of mood and anxiety disorder in self reported irritable bowel syndrome (IBS). An epidemiological population based study of women. *Bio Med Cen Gastroenterology* 2010; 10:88.
  31. Tollefson GD, Tollefson SL, Pederson M, Luxenberg M, Dunsmore G. Comorbid irritable bowel syndrome in patients with generalized anxiety and major depression. *Ann Clin Psychiatry* 1991; 3:215-22.
  32. Masand PS, Kaplan DS, Gupta S, Bhandary AN, Nasra GS, Kline MD et al. Major depression and irritable bowel syndrome: is there a relationship? *J Clin Psychiatry* 1995; 56:363-7.
  33. Garakani A, Win T, Virk S, Gupta S, Kaplan D, Masand PS. Comorbidity of irritable bowel syndrome in psychiatric patients: a review. *Am J Ther* 2003; 10: 61-7.
  34. Gros DF, Antony MM, McCabe RE, Swinson RP. Frequency and severity of the symptoms of irritable bowel syndrome across the anxiety disorders and depression. *J Anxiety Disord* 2009; 23:290-6.
  35. Naeem SS, Siddiqui EU, Kazi AN, Memon AA, Khan ST, Ahmad B. Prevalence and factors associated with irritable bowel syndrome among medical students of Karachi, Pakistan: a cross-sectional study. *Bio Med Cen Res Notes* 2012; 5:255.
  36. Jung HJ, Park MI, Moon W, Park SJ, Kim HH, Noh EJ, et al. Are food constituents relevant to the irritable bowel syndrome in young adults? A Rome III based prevalence study of the Korean medical students. *J Neurogastroenterol Motil* 2011; 17: 294-9.
  37. Mansour-Ghanaei F, Fallah MS, Heidarzadeh A, Jafarshad

- R, Joukar F, Ghasemipour R et al. Prevalence and characteristics of irritable bowel syndrome (IBS) amongst medical students of Gilan Northern Province of Iran. *Midd East J Dig Dis* 2011; 1:100-5.
38. Jahangiri P, Jazi MS, Keshteli AH, Sadeghpour S, Amini E, Adibi P. Irritable Bowel Syndrome in Iran: SEPAHAN systematic review No. 1. *Int J Prev Med* 2012; 3:S1-9.
39. Lee OY, Mayer EA, Schmulson M, Chang L, Naliboff B. Gender-related differences in IBS symptoms. *Am J Gastroenterol* 2001; 96:2184-93.
40. Mayer EA, Naliboff B, Lee O, Munakata J, Chang L. Review article: gender-related differences in functional gastrointestinal disorders. *Aliment Pharmacol Ther* 1999; 2:65-9.

### CONTRIBUTORS

MW conceived the idea, planned the study, and drafted the manuscript. NW and SZ helped acquisition of data and did statistical analysis. MI critically revised the manuscript. All authors contributed significantly to the submitted manuscript.