

Irritable Bowel Syndrome in Patients with Chronic Viral Hepatitis

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ABSTRACT

Background: Irritable bowel syndrome (IBS) is a chronic functional gastrointestinal disorder characterized by abdominal pain or discomfort, in association with altered bowel habit. Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are two communicable diseases in which there have been increases in related morbidity and mortality over the past 20 years.

Objective: Our study aimed to investigate a possible association between IBS as one of psychosomatic disorders and chronic viral hepatitis and to follow up the improvement of patients' condition after management.

Patients and Methods: A prospective case-control study included 481 consecutive patients attending the outpatient clinic and were all applied to IBS questionnaire. They were divided into three groups: HCV cases (n = 246), HBV cases (n = 183) and co-infection cases (n = 52), in addition to normal control cases (n = 145).

Results: Prevalence of IBS was 17.24% in normal individuals who were included as control group. The highest prevalence of IBS was seen among HCV cases (45.53%), followed by cases with combined HCV and HBV infection (30.77%), then cases with isolated HBV (24.59%). There was a significant relation between IBS and chronic hepatitis which means that IBS prevalence was higher among chronic hepatitis cases. The improvement of IBS symptoms was significantly better among HBV cases who received antiviral treatment but that wasn't the same among HCV cases who received antiviral treatment.

Conclusions: There is a significant relation between IBS and chronic hepatitis, as IBS prevalence was higher among chronic hepatitis cases than general population. Young adult patients with chronic HCV with a previous history of psychiatric symptoms are more likely to have IBS.

Keywords: Chronic Viral Hepatitis, Irritable Bowel Syndrome, Psychosomatic disorders.

INTRODUCTION

Irritable bowel syndrome is one of the most common syndromes seen by gastroenterologists and primary care providers with a prevalence rate of 10–15% in industrialized countries⁽¹⁾. Despite its relatively high prevalence rate, only about 10–30% of afflicted individuals seek medical care⁽²⁾.

Patients with IBS often report altered bowel movements, such as diarrhea, constipation, alternating diarrhea and constipation, or predominantly normal bowel movements with occasional diarrhea or constipation. The Bristol stool scale can help patients to identify which type of stool is most frequently observed in their bowel movements⁽³⁾.

Irritable bowel syndrome is a multifactorial condition in which gastrointestinal (GI) motor and sensory dysfunction and psychological traits may contribute in combination with a series of environmental factors such as acute GI infections and food intolerance. There also may be a background genetic predisposition⁽⁴⁾.

Patients with Chronic hepatitis usually have different abdominal complaints. Abdominal pain or discomfort is frequently seen in clinical practice in patients with chronic hepatitis without organic lesion, the functional origin of abdominal complaints is claimed in many patients⁽⁵⁾.

We aim to investigate the possible association between irritable bowel syndrome (IBS) as one of psychosomatic disorders and chronic viral hepatitis and

to follow up the improvement of patients' condition after management of chronic viral hepatitis.

PATIENTS AND METHODS

This is a prospective case-control study included 481 consecutive adults with chronic viral hepatitis attending the outpatient clinic of the Tropical Medicine and Gastroenterology Department, Sohag Faculty of Medicine.

Ethical approval:

We got acceptance of Ethical Committee at Sohag Faculty of Medicine. Patients were informed about the survey by the doctors and were asked for voluntary participation in the study and they signed informed written consent before starting the study with respect to patients' confidentiality. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

The patients were divided into three groups: HCV cases (133 females and 113 males), HBV cases (86 females and 97 males) and Co-infection cases (30 females and 22 males). In addition to 145 normal individuals were included as a control group. All patients and control group were subjected to IBS questionnaire.



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Inclusion criteria: Patients with HCV antibody positive, HBV surface antigen positive or both for 6 months at least and also patient free from any organic causes for symptoms.

Exclusion criteria: Patients with liver cirrhosis, manifestations of liver cell failure, patients with HCC, patients with any psychological disorders.

Questionnaire:

This questionnaire was based on Rome III diagnostic questionnaire for IBS which was designed by the Rome Committee (6). These criteria require that a person be experiencing chronic abdominal pain or discomfort at least three days per month in the last three months, with an onset of symptoms at least six months prior.

These symptoms must associated with two or more of the following:

- Improvement of pain with a bowel movement.
- Symptom onset is related to a change in stool frequency.
- Symptom onset is related to a change in the appearance of stool.

In questionnaire; baseline characteristics of the patients including sex, age, marital status, educational level and occupational category were recorded. Then, data on their symptoms consisted of reflux, nausea, vomiting, anorexia, weight loss, fatigue, heart burn, constipation, diarrhea, and bloating were asked for and added to the medical records of the patients.

Statistical analysis

Data was analyzed using STATA version 14.2 (Stata Statistical Software: Release 14.2 College Station, TX: StataCorp LP.). Quantitative data were represented as mean, standard deviation, median and range and were compared by Mann-Whitney test. Qualitative data were presented as number and percentage and compared using either Chi square test or Fisher exact test. Graphs were produced by using Excel or STATA program. P value was considered significant if it was less than 0.05.

RESULTS

In the total studied sample, we found that the highest prevalence of IBS was seen among HCV cases (Figure 1).

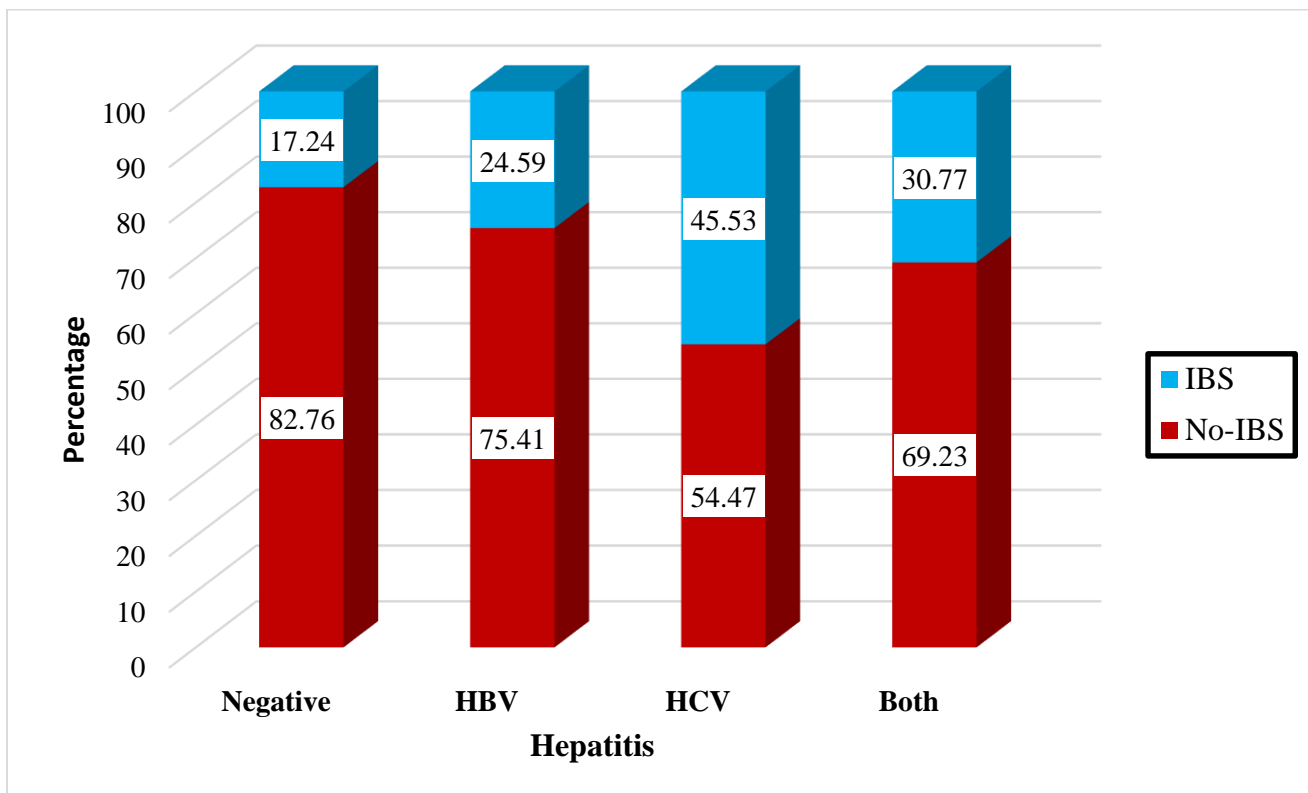


Figure (1): Prevalence of IBS in Studied groups

IBS patients showed a highly significant relations between hepatitis prevalence and each of occupation and marital status. In the presence of viral hepatitis, the prevalence of IBS was higher in married housewives, workers and farmers (Table 1).

Table (1): Comparison between IBS patients in both hepatitis and control groups according to personal characteristic

Variable	Hepatitis patients with IBS (N=173)	Control with IBS (N=25)	P value
Age/year			
Mean ± SD	39.83±14.91	38.6±16.06	0.54
Median (range)	38 (18:78)	34 (21:67)	
Gender			
Female	89 (51.45%)	14 (56%)	0.67
Male	84 (48.55%)	11 (44%)	
Occupation			
Unemployed	1 (0.58%)	0 (0%)	0.004*
Employee	19 (10.98%)	5 (20%)	
Engineer	1 (0.58%)	0 (0%)	
Farmer	19 (10.98%)	2 (8%)	
Housewife	67 (38.72%)	4 (16%)	
Student	21 (12.14%)	11 (44%)	
Teacher	6 (3.47%)	0 (0%)	
Worker	39 (22.54%)	3 (12%)	
Marital status			
Single	33 (19.07%)	11 (44%)	0.007*
Married	115 (66.47%)	9 (36%)	
Widow	25 (14.45%)	5 (20%)	
Special habit			
No	10 (5.78%)	2 (8 %)	0.98
Tea	61 (35.26%)	8 (32 %)	
Coffee	40 (23.12%)	6 (24 %)	
Smoking	10 (5.78%)	1 (4 %)	
Smoking and coffee	52 (30.06%)	8 (32%)	

IBS= Irritable bowel syndrome, SD= standard deviation, *: Significant

The most common presentation of IBS in hepatitis patients was diarrhea (Figure 2).

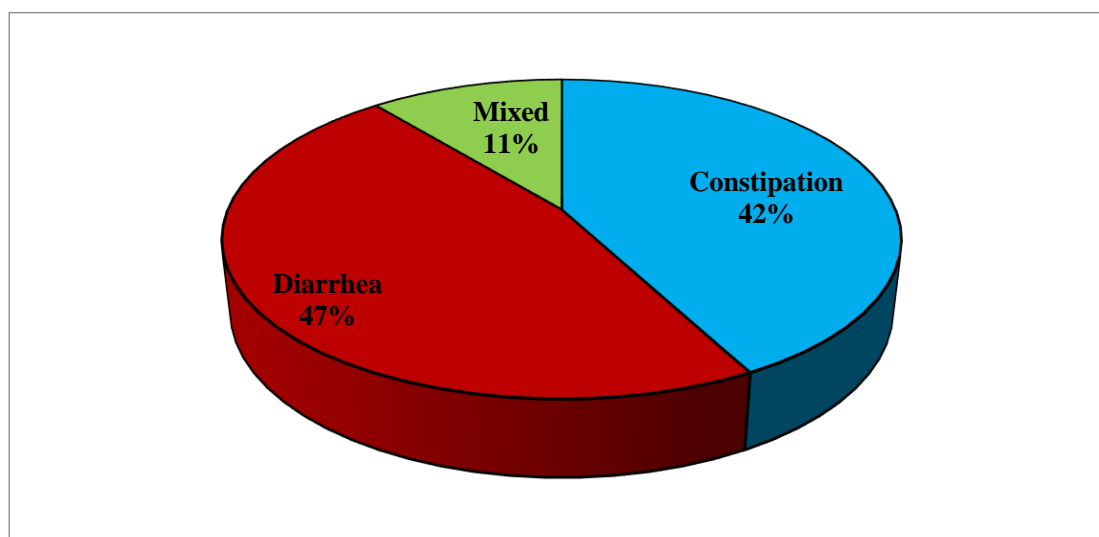


Figure (2): Subtypes of IBS among Hepatitis patients

The results showed that public anxiety and worsening of the symptoms with stress among IBS cases was significantly higher than cases with no IBS. Anxiety, headache and depression showed significant worsening among IBS cases compared to those with no IBS. On the other hand, irritability and recurrent nightmares showed non-significant differences between the two groups (Table 2).

Table (2): Comparison between patients with and without IBS according to associated symptoms

Variable	IBS N=198	No-IBS N=428	P value
Anxiety	102 (51.52%)	163 (38.08%)	0.002*
Headache	96 (48.48%)	166 (38.79%)	0.02*
Irritability and agitation	47 (23.74%)	85 (19.86%)	0.27
Worsen with stress	91 (45.96%)	0	<0.0001*
Depression	29 (14.65%)	27 (6.31%)	0.001*
Recurrent nightmares	26 (13.13%)	37 (8.64%)	0.08
Public Anxiety	35 (17.68%)	25 (5.84%)	<0.0001*

IBS= Irritable bowel syndrome, *: Significant

There were no significant relations between IBS and each of viral load, ultrasonographic liver findings or receiving hepatitis treatment in the total sample (Table 3).

Table (3): Comparison between patients with and without IBS according to PCR, hepatitis treatment and ultrasonographic finding

Variable	IBS (N=173)	No-IBS (N=308)	P value
PCR for Hepatitis			
Mean ± SD	427029±32190	253447±92139	0.21
Median	10450	7585	
US finding			
Normal	106 (61.27%)	179 (58.11%)	0.74
DHP	45 (26.01%)	83 (26.94%)	
Fatty liver	22 (12.71%)	46 (14.93%)	
Hepatitis treatment			
No	28 (16.18%)	66 (21.43%)	0.16
Yes	145 (83.82%)	242 (78.57%)	

IBS= Irritable bowel syndrome, SD= standard deviation, PCR= Polymerase Chain Reaction, US= Ultrasoundography, DHP= diffuse hepatic pathology.

Based on the pairwise comparison between the four groups, there was a highly significant association between the presence of HCV infection and IBS, while there was no association between the presence of HBV infection and IBS. Also there were non-significant association between type of viral hepatitis infection and each course and improvement of IBS (Table 4).

Table (4): Relation between hepatitis (each type) and IBS diagnosis, course of disease and outcome of symptoms

Variable	Control (Negative)	HBV group	HCV group	Co-infection group	P value *
IBS diagnosis	N=145	N=183	N=246	N=52	
Positive	25 (17.24%)	45 (24.59%)	112 (45.5%)	16 (30.77%)	<0.0001*
*P1=0.11, P2 <0.0001, P3=0.04, P4<0.0001, P5=0.37, P6=0.051					
Course of the disease		N=18	N=64	N=5	
Increased		14 (77.78%)	37 (57.81%)	2 (40.00%)	0.19
The same		4 (22.22%)	27 (42.19%)	3 (60.00%)	
Improvement	N=25	N=45	N=112	N=16	
No	12 (48.00%)	23 (51.11%)	49 (43.75%)	8 (50.00%)	0.84
Yes	13 (52.00%)	22 (48.89%)	63 (56.25%)	8 (50.00%)	

IBS= Irritable bowel syndrome, HBV= Hepatitis B virus, HCV= Hepatitis C Virus. P value compared the four group, pairwise comparison was done. P1 compared control with HBV, P2 control with HCV, P3 control with co-infection, P4 HBV with HCV, P5 HBV with Both and P6 HCV with co-infection. *: Significant.

The relation between receiving hepatitis treatment and improvement of IBS wasn't significant in HCV patients (Table 5). On the other hand, in chronic HBV patients, IBS was significantly improved after receiving hepatitis treatment (Table 6).

Table (5): Relation between hepatitis treatment and IBS diagnosis, course of disease and outcome in patients with hepatitis C

Variable	No HCV treatment	HCV treatment	P value
IBS diagnosis	N=12	N=234	
Positive	4 (33.33%)	108 (46.15%)	0.38
Course of the disease	N=2	N=62	
Increased	2 (100%)	35 (56.45%)	0.50
The same	0	27 (43.55%)	
Improvement	N=4	N=108	
No	2 (50.00%)	47 (43.52%)	1.00
Yes	2 (50.00%)	61 (56.48%)	

IBS= Irritable bowel syndrome, HCV= Hepatitis C virus.

Table (6): Relation between hepatitis treatment and IBS diagnosis, course of disease and outcome in patients with hepatitis B

Variable	No HBV treatment	HBV treatment	P value
IBS diagnosis	N=71	N=88	
Positive	21 (29.58%)	24 (21.43%)	0.75
Course of the disease	N=9	N=9	
Increased	9 (100%)	5 (55.56%)	0.08
The same	0	4 (44.44%)	
Improvement	N=21	N=24	
No	15 (71.43%)	8 (33.33%)	0.01*
Yes	6 (28.57%)	16 (66.67%)	

IBS= Irritable bowel syndrome, HBV= Hepatitis B virus,

*: Significant

DISCUSSION

After applying IBS questionnaire, we found that prevalence of IBS was 17.24% in normal individuals who were included as a control group and that came in line with many studies (7-9). This percentage raised in the presence of chronic viral hepatitis. IBS was detected in nearly half of HCV patients (45.53%) and in 24.59% of chronic HBV patients. In this regard, another study conducted in Tropical Medicine Department of Minya University over 454 adults by applying a questionnaire based on ROME criteria III, showed that chronic hepatitis patients are highly susceptible to have IBS (10).

Our study, showed non-significant difference between chronic hepatitis and normal control groups regarding age and gender difference. However, IBS patients showed significant relations between hepatitis prevalence and each of occupation and marital status; as hepatitis prevalence was higher in married housewives, workers and farmers. That came a line with many studies (11, 12). Also, **Paetz et al.** (13) study that was done at two tropical hospitals of Cairo showed marriage is independently associated with HCV infection.

In the current study, we found that the most common presentation of the IBS among hepatitis patients was diarrhea, followed by constipation and mixed diarrhea and constipation. These results came similar to previous studies (10, 14). While mixed IBS was

found to be the most common presentation in other studies (15, 16). Also, we found that psychiatric conditions such as depression, anxiety, and headache were found to be more likely to happen with IBS patients. That's similar to the results of other studies which consider IBS as one of psychosomatic illness (17, 18). Most of these previous studies conducted on general population regardless of relation with other factors and diseases that may lead to change in the presentation of IBS.

In this regard the agreement of those previous studies with ours could be explained by the fact that IBS is in the class of functional gastrointestinal disorders, and results from dysregulation of central and enteric nervous systems interactions. Psychosocial factors are also closely related to the gut physiology, disease presentation and behavior (19).

Also, we found that hepatitis viremia had no relation with IBS prevalence. That agreed with **Fouad et al.** (10) study that showed no difference in IBS prevalence regarding HCV viremia.

In our study, we found a highly significant association between the presence of HCV infection and IBS, while there was no association between the presence of HBV infection and IBS. Also there were non-significant association between type of viral hepatitis infection and each course and improvement of IBS. In this regard, **Fouad et al.** (10) study also showed that prevalence of IBS was significantly higher in patients with chronic HCV (66%, 170/258) than patients with chronic HBV (22%, 8/36). However, as few previous studies had investigated the relationship between IBS and each of chronic hepatitis B and C in humans, further studies are needed to confirm this hypothesis.

On the contrary, in a previous report that was done over 190 adults (95 HCV patient and 95 Control cases), although the authors found a higher frequency of IBS in the HCV group than in the healthy control group (6.3% vs 2.1%), but with statistically non-significant differences (20). Another cross-sectional study was done on a total of 196 hemodialysis patients to identify factors significantly associated with IBS symptoms, they found a non-significant association between IBS and chronic hepatitis (21). The reasons for this disagreement might be a relatively old criteria for IBS diagnosis (e.g. Manning's criteria) used by the investigators and a relatively smaller number of patients in the studied samples.

Our study showed a significant association between receiving HBV treatment and improvement of IBS symptoms but this association appeared less in receiving HCV treatment.

This improvement may be explained by the fact; IBS is best viewed as an interaction of important biological and psychosocial factors that are variably involved depending on the individual condition. These factors may be altered motility, visceral hyperalgesia, disturbance of the brain-gut interaction, autonomic and hormonal events, genetic and environmental factors and

psychosocial disturbance^(1, 4). Also, receiving HBV, and HCV antiviral treatment had improved psychiatric symptoms in general, and patients' satisfaction with hepatitis therapy had a role in reduction of anxiety and other psychosomatic illnesses^(22, 23).

CONCLUSION

There is a significant relation between IBS and chronic hepatitis, as IBS prevalence was higher among chronic hepatitis cases than general population. Young adult patients with chronic HCV with a previous history of psychiatric symptoms are more likely to have IBS. Receiving antiviral treatment has a good prognosis on the course of IBS, especially in HBV patients.

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