

## Incidence of overlap syndrome of functional dyspepsia and irritable bowel syndrome in Western UP

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### Abstract

**Aim:** To determine the incidence and risk factors for the clinical overlap between Functional Dyspepsia and Irritable Bowel syndrome defined by Rome IV criteria in Indian patients. **Materials and methods:** The present cross sectional study was carried out in Chatrapati Shivaji Subharti Hospital, Meerut in the Department of Medicine among consecutive patients with upper gastrointestinal symptoms who was referred for endoscopy. A structured questionnaire containing the FD and IBS modules of functional gastrointestinal disorders (FGIDs) and the putative risk factors for dyspepsia was administered to the participants. **Results:** Out of 500 subjects; FD, IBS and overlap was reported among 17.4%, 13.8% and 10.2% of the subjects respectively. Overall functional gastrointestinal disorders (FGID) were found in 207 (41.4%) subjects. Alcohol consumption was reported among 6.90%, 15.94% and 27.45% of the subjects having FD, IBS and overlap syndrome respectively. Hard or lumpy stools and defecation straining was reported more in subjects with overlap syndrome subjects followed by FD and IBS with statistically significant difference. Loose or watery stools was found least in FD subjects. A feeling of incomplete bowel movement was maximally revealed in overlap syndrome subjects. **Conclusion:** Patients having either FD or IBS overall have less severe symptoms and patients with overlap may represent the more severe symptoms as compared with FD or IBS.

**Keywords:** dyspepsia, severe

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### Introduction

The term functional dyspepsia (FD) is used if there is no evidence of structural disease which is likely to explain the symptoms. When there is a structural lesion to account for dyspeptic symptoms, the term organic dyspepsia is used<sup>1,2</sup>. Irritable bowel syndrome (IBS) is a chronic, often disabling gastrointestinal disorder characterized by abdominal pain or abdominal discomfort associated with a change in bowel habits. The prevalence of IBS diagnosed using the Rome III criteria in the general population has been reported to be 29.2%<sup>3</sup>. Although IBS has been defined and classified as a functional bowel disorder, recent studies involving the general population and patients in clinical settings have demonstrated that there is a high proportion of patients satisfying the diagnostic criteria for both IBS and functional dyspepsia (FD)<sup>4,5</sup>.

Epidemiological studies suggest a considerably high rate of overlap between functional dyspepsia (FD) and irritable bowel syndrome (IBS). According to the recent systematic review and meta-analysis, the prevalence of IBS in subjects with dyspepsia is 37% (95% CI, 30%-45%) as compared to 7% (95% CI, 5%-10%) in those without. The pooled odds ratio for IBS in subjects with dyspepsia was 8 (95% CI, 5.74-11.16) as compared to that in those without dyspepsia<sup>1</sup>.

Current activity of these two disorders indicated by Rome III criteria, has changed the symptomatic characteristics of FD and IBS. In addition, the discovery that the presence of IBS does not exclude the

diagnosis of any functional gastroduodenal disorder makes the evaluation of overlap between FD and IBS with Rome III criteria more accurate. Therefore, the overlap between FD and IBS according to Rome III criteria may be different from such overlap diagnosed with the former criteria<sup>4</sup>.

No studies have been performed to investigate the overlap between FD and IBS according to Rome IV criteria. Since most pathophysiological studies enroll subjects from clinics, a study of the clinical overlap of FD and IBS may provide clues and new insights for future pathophysiological studies of both disorders. The aim of the present study was to determine the incidence and risk factors for the clinical overlap between FD and IBS defined by Rome IV criteria in Indian patients.

### Materials and methods

The present cross sectional study was carried out in Chatrapati Shivaji Subharti Hospital, Meerut in the Department of Medicine among consecutive patients with upper gastrointestinal symptoms who was referred for endoscopy between December 2020 and May 2022 formed the study population. Ethical approval was obtained from the research ethics committee of University. All the participants were told about the study and informed consent was taken.

### Inclusion Criteria

- 1.) Subjects who gave consent.
- 2.) All the patients with age >18years

### Exclusion Criteria

- 1.) Diabetes mellitus, hyperthyroidism, hypothyroidism and

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- other metabolic diseases;
- 2.) Malignant diseases at any site, liver cirrhosis, advanced chronic kidney disease, heart failure and other severe illnesses;
  - 3.) Infectious diseases of the gastrointestinal system caused by bacteria, viruses, parasites, etc.;
  - 4.) Peptic ulcer, reflux esophagitis, Barrett's esophagus, inflammatory bowel disease confirmed by gastroscopy and colonoscopy;
  - 5.) History of digestive tract surgery or other organic diseases
- We defined FD and IBS according to the ROME IV criteria.

**Method:**

A structured questionnaire containing the FD and IBS modules of functional gastrointestinal disorders (FGIDs) and the putative risk factors for dyspepsia was administered to the participants. Patients who satisfied the diagnostic criteria for dyspepsia (postprandial fullness, easy satiety, epigastric pain, and/or epigastric burning for the past three months with onset at least six months before diagnosis)

IBS- Defined as recurrent abdominal pain for atleast 1 day/week in the last 3 months associated with 2 or more following criteria

- 1) Associated with hange in stool frequency
- 2) Associated with hange in stool form

The above criteria ist be fulfilled or 3 months with onset of some symptoms atleast 6 months before diagnosis

**Statistical Analysis**

Data so collected was tabulated in an excel sheet, under the guidance of statistician. The means and standard deviations of the measurements per group were used for statistical analysis (SPSS 24.00 for windows; SPSS inc, Chicago, USA).

**Results**

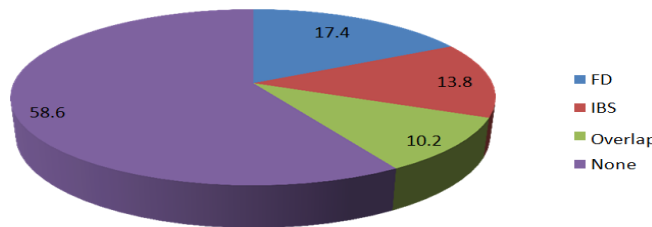
Out of 500 subjects; FD, IBS and overlap was reported among 17.4%, 13.8% and 10.2% of the subjects respectively. Overall functional gastrointestinal disorders (FGID) were found in 207 (41.4%) subjects (table 1).

**Table 1:** Distribution of study subjects based on diagnosis

Diagnosis	N = 500	%
FD	87	17.4
IBS	69	13.8
Overlap	51	10.2
None	207	41.4

Out of 207 FGID subjects, females were comparatively more as compared to males. IBS was revealed more in males whereas FD and overlap occurs more in females. Significant difference was found among male and females w.r.t. FD vs IBS and IBS vs Overlap as p<0.05. Mean age among the FD, IBS and overlap subjects was

52.20±8.71, 45.91±10.34 and 47.1±9.22 years respectively. Mean age was comparable among subjects suffering from IBS and overlap. However age among FD subjects was more when compared to subjects suffering from IBS and overlap disorder with statistically significant difference (table 1).



**Graph 1:** Distribution of study subjects based on diagnosis

**Table 1:** Gender and mean age distribution among the study subjects according to diagnosis

Gender	FD		IBS		Overlap		p value		
	N=87	%	N=69	%	N=51	%	FD vs IBS	FD vs Overlap	IBS vs Overlap
Male	33	37.93	37	53.62	20	39.22	0.031*	0.76	0.039*
Female	54	62.07	32	46.38	31	60.78			
<b>Age (in years)</b>									
Mean	52.20		45.91		47.1		0.011*	0.018*	0.43
SD	8.71		10.34		9.22				

\*: statistically significant

Alcohol consumption was reported among 6.90%, 15.94% and 27.45% of the subjects having FD, IBS and overlap syndrome respectively. Hence alcohol consumption was found more in overlap syndrome subject's followed by IBS. Significant difference wr.t.

alcohol consumption was found when compared between FD vs Overlap as p<Smoking was found more in subjects suffering from IBS. Significant difference wr.t. smoking was found when compared between IBS vs Overlap as p<0.05 (table 2).

**Table 2:** Alcohol (>35 g/week) and current smoker among the study subjects according to diagnosis

Alcohol (>35 g/week)	FD		IBS		Overlap		p value		
	N = 87	%	N = 69	%	N = 51	%	FD vs IBS	FD vs Overlap	IBS vs Overlap
Yes	6	6.90	11	15.94	14	27.45	0.10	<0.01*	0.08
No	81	93.10	58	84.06	37	72.55			
<b>Current Smoker</b>									
Yes	9	10.34	15	21.74	4	7.84	0.06	0.79	0.009*
No	78	89.66	54	78.26	47	92.16			

\*: statistically significant

Table 3 shows the symptoms among the study subjects according to diagnosis. Early satiation and epigastric pain/burning was reported more in FD subjects while postprandial fullness in overlap syndrome.

Bloating, nausea and vomiting was associated more with overlap syndrome followed by FD.

**Table 3:** Symptoms among the study subjects according to diagnosis

Symptoms	FD		IBS		Overlap		p value		
	N = 87	%	N = 69	%	N = 51	%	FD vs IBS	FD vs Overlap	IBS vs Overlap
Early satiation	43	49.43	-	-	22	43.14	NA	0.66	NA
Postprandial fullness	56	64.37	-	-	49	96.08	NA	<0.01*	NA
Epigastric pain/burning	62	71.26	-	-	36	70.59	NA	0.92	NA
Bloating	34	39.08	26	37.68	41	80.39	0.82	<0.01*	<0.01*
Nausea	26	29.89	7	10.14	24	47.06	<0.01*	0.027*	<0.01*
Vomiting	10	11.49	2	2.90	9	17.65	0.007*	0.09	<0.01*

NA: not applicable, \*: statistically significant

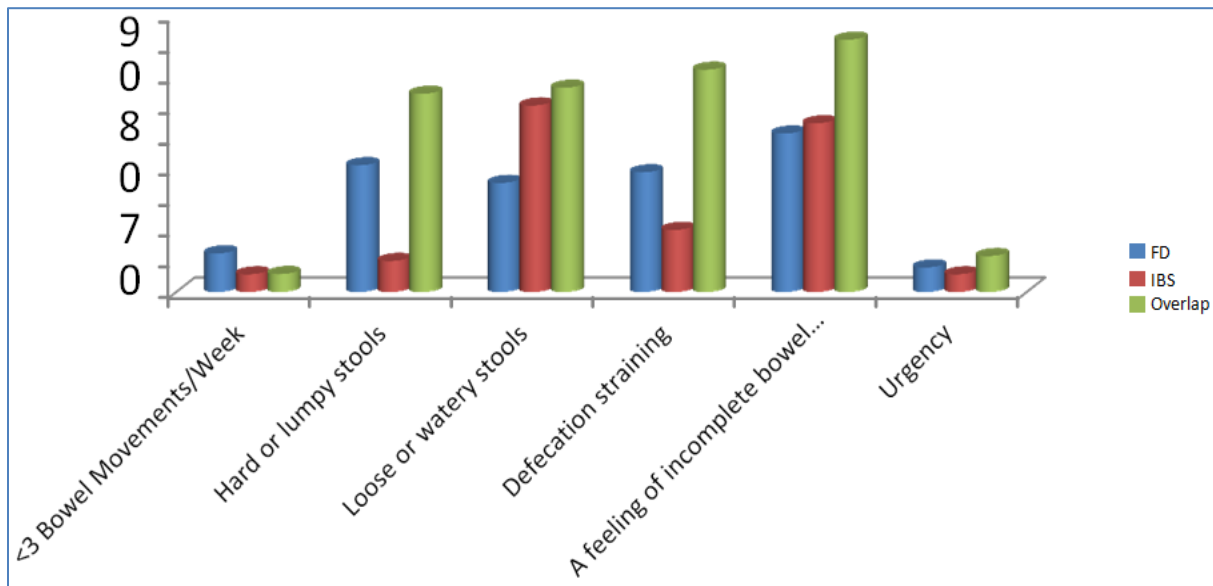
<3 bowel movements/week was comparable among the study subjects, though found more in FD subjects. Hard or lumpy stools and defecation straining was reported more in subjects with overlap syndrome subjects followed by FD and IBS with statistically

significant difference. Loose or watery stools was found least in FD subjects. A feeling of incomplete bowel movement was maximally revealed in overlap syndrome subjects (table 4).

**Table 4:** Comparison of bowel parameters among the study subjects according to diagnosis

Variables	FD		IBS		Overlap		p value		
	N = 87	%	N = 69	%	N = 51	%	FD vs IBS	FD vs Overlap	IBS vs Overlap
<3 Bowel Movements/Week	11	12.64	4	5.80	3	5.88	0.21	0.24	0.89
Hard or lumpy stools	36	41.38	7	10.14	33	64.71	<0.01*	0.004*	<0.01*
Loose or watery stools	31	35.63	42	60.87	34	66.67	0.009*	0.005*	0.67
Defecation straining	34	39.08	14	20.29	37	72.55	0.013*	<0.01*	<0.01*
A feeling of incomplete bowel movement	45	51.72	38	55.07	42	82.35	0.82	<0.01*	<0.01*
Urgency	7	8.05	4	5.80	6	11.76	0.70	0.76	0.54

\*: statistically significant



**Discussion**

A previous meta-analysis reported an eight-fold increase in odds of IBS in people with FD, compared with those without, and overlap between the two in up to 40% of individuals<sup>6</sup>. In fact, although overlap between DGBI is not specifically dealt with in the Rome classification system, it is represented by a genuine cohort of patients in daily clinical practice<sup>7</sup>.

Nevertheless, there are limited data exploring differences between patients with IBS alone and those with IBS and FD overlap.

Out of 500 subjects; FD, IBS and overlap was reported among 17.4%, 13.8% and 10.2% of the subjects respectively in this study. Overall functional gastrointestinal disorders (FGID) were found in 207

(41.4%) subjects. Out of 207 subjects with FGID; FD, IBS and overlap was found in 42.03%, 33.33% and 24.64% of the subjects respectively. Epidemiological studies concerning the rate of FD and IBS concurrence have demonstrated a wide range (13–87%) of overlap between these two disorders<sup>8-13</sup>. This wide range may be due to differences in these studies such as the varied study populations from different countries and different diagnostic criteria used. AnJiang WANG et al<sup>14</sup> in their study revealed that FD-IBS overlap was observed in 5.0% of the patients, while 15.2% and 10.9% of the patients were classified as FD alone and IBS alone, respectively. These findings are approximately similar to our study. In a study by Radislav Nakov et al<sup>15</sup>, the prevalence of IBS in the study population

was 20%, whereas prevalence of FD in the study population was 12.7%. The prevalence of overlap syndrome (OS) in the study population was 11.7%. It has already been reported that there is variance among the countries in the prevalence of IBS and other FGID. There are several potential explanations for this variability, including genetics, cultural differences, ethnic diversity, social reporting sensitivity, levels of stress, and dietary habits. Out of 207 FGID subjects, females were comparatively more as compared to males. IBS was revealed more in males whereas FD and overlap occurs more in females. Significant difference was found among male and females w.r.t. FD vs IBS and IBS vs Overlap syndrome (OS) as  $p < 0.05$  in this study. The prevalence of IBS in women has been reported to be approximately 1.5- to 3-fold higher than that in men<sup>16</sup>. However, in Asia, South America, and Africa, rates of IBS in men are much closer to those of women, and higher than those in women in some cases<sup>17</sup>. Similarly, we found no female predominance in IBS alone, in line with the Indian study<sup>18</sup>. This might be due to differences in healthcare-seeking behavior related to cultural differences. Several hypotheses have been suggested to describe the higher prevalence in females, i.e., higher serotonin synthesis in the brain, female sex hormones' impact on GI motility and potential association of IBS with an anti-nociceptive mechanism decreasing pain related to pelvic events such as pregnancy and delivery.

Mean age among the FD, IBS and overlap subjects was  $52.20 \pm 8.71$ ,  $45.91 \pm 10.34$  and  $47.1 \pm 9.22$  years respectively. Mean age was comparable among subjects suffering from IBS and overlap. However age among FD subjects was more when compared to subjects suffering from IBS and overlap disorder with statistically significant difference in this study. According to Moritz von Wulffen et al<sup>19</sup>, mean age among the study subjects was 49.0 years, which is approximately similar to our study. AnJiang WANG et al<sup>14</sup> in their study found similar age distribution. Alcohol consumption was reported among 6.90%, 15.94% and 27.45% of the subjects having FD, IBS and overlap syndrome respectively. Hence alcohol consumption was found more in overlap syndrome subject's followed by IBS. Significant difference w.r.t. alcohol consumption was FD vs Overlap as  $p < 0.05$  in the present study. Radislav Nakov et al<sup>15</sup> in their study found that individuals who did not consume alcohol in their study were more likely to suffer from IBS compared to those who did. AnJiang WANG et al<sup>14</sup> in their study revealed similar findings.

The strength of our study is that it is one of the few studies to analyse the prevalence of OS, using the Rome IV criteria for IBS and FD. While an overlap of FD and IBS is mentioned as a possibility in the Rome IV criteria, we found a considerable prevalence of the OS among the study subjects. The limitation of the present study is that other factors known to be related to IBS and FD were not addressed, such as depression and anxiety. Another limitation is that the diagnosis of FD was based on fulfilling symptom-based criteria and was not subsequently confirmed by clinical evaluation or endoscopy.

#### Conclusion

In summary, our data, based upon a cohort of consecutive patients referred to a tertiary center demonstrate that in the routine clinical practice the majority of patients with functional GI disorders have an overlap of FD and IBS. Patients having either FD or IBS overall have less severe symptoms and patients with overlap may represent the more severe end of the spectrum of patients with FD or IBS. The implications of overlap of FD and IBS for the long- term outcome of patients and the response to therapies—including the response in clinical trials—need to be explored.

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