

Frequency of Overlap between Functional Dyspepsia and Functional Bowel Disorder in Clinical Settings

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ABSTRACT

Introduction: Disorders of gut–brain interaction (DGBI) are one of the leading cause to visit gastroenterologists globally characterized by clusters of chronic gastrointestinal symptoms without an identifiable structural or biochemical abnormality. Functional dyspepsia (FD) and functional bowel disorders (FBD), including irritable bowel syndrome (IBS), functional constipation, and functional diarrhea, represent major clinical phenotypes of DGBI. This study aimed to determine the frequency of overlap between functional dyspepsia and functional bowel disorders in clinical settings. **Methods & Materials:** This descriptive cross-sectional study was conducted from January 2023 to October 2023 at National Gastro-Liver Institute and Hospital, Mohakhali, Dhaka, Bangladesh. Patients attending the out-patient department of medical gastroenterology in NGLIH, having evidence to support a diagnosis of DGBI according to the Rome IV diagnostic criteria were included in the study. Consecutive sampling was used to enroll 595 patients among 2,227 out-door patients after obtaining informed written consent, using the Bengali version of the Rome IV questionnaire along with a structured data collection form. Data were analyzed using SPSS Statistics version 26.0. **Results:** The study found that DGBIs were common among the study participants, with functional bowel disorders (FBD) being the most frequent regional category and functional dyspepsia (FD) the most common individual diagnosis. Substantial overlap between FD and FBD was observed, particularly FD-IBS (14.6%), followed by FD-functional constipation (11.3%) and FD-functional diarrhea (9.1%).

Conclusion: DGBIs were frequently observed in this clinical cohort, with functional bowel disorders representing the predominant regional category and functional dyspepsia being the most common individual diagnosis. Considerable overlap was identified between FD and functional bowel disorders, most notably FD-IBS (14.6%), followed by FD-functional constipation (11.3%) and FD-functional diarrhea (9.1%). These overlapping presentations may make symptom interpretation more challenging, contribute to suboptimal treatment responses, and ultimately increase patient dissatisfaction.

Keywords: Disorders of gut–brain interaction, Functional Dyspepsia, Functional Bowel Disorder, Overlap

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INTRODUCTION

Disorders of Gut-Brain Interaction (DGBI), formerly termed functional gastrointestinal disorders, comprise symptom-defined gastrointestinal conditions arising from complex bidirectional interactions between gastrointestinal physiology, the enteric and central nervous systems, immune mechanisms, gut microbiota and psychosocial factors, without a structural abnormality sufficient to explain the symptoms. The Rome IV classification established DGBI as a biopsychosocial disease concept and emphasized abnormalities in gastrointestinal motility, visceral sensitivity, mucosal and immune function, intestinal microbiota, and central nervous system processing as important components of pathophysiology [1]. DGBIs are anatomically categorized into esophageal, gastroduodenal, bowel, and anorectal disorders; centrally mediated abdominal pain and biliary disorders constitute additional categories in the Rome framework [1,2]. Functional dyspepsia (FD), characterized by Postprandial Distress Syndrome (PDS) and Epigastric Pain Syndrome (EPS) is the principal

gastroduodenal DGBI, whereas irritable bowel syndrome (IBS), Functional constipation, Functional diarrhea and Functional bloating/distension constitute major bowel DGBI [2,3]. DGBI represent a substantial worldwide health burden. The Rome Foundation Global Study, involving 33 countries across six continents, found that approximately 40% of adults fulfilled criteria for at least one DGBI, demonstrating that these disorders are not confined to Western populations [4]. In a population study from the United States, Canada, and the United Kingdom, 35.0% of participants met criteria for a Rome IV functional gastrointestinal disorder; bowel disorders were the most frequent regional category (28.1%), followed by gastroduodenal disorders (10.6%), anorectal disorders (7.4%), and esophageal disorders (7.0%) [5]. FD also shows substantial international variation: a recent meta-analysis of 44 studies including 256,915 participants from 40 countries estimated a pooled prevalence of 8.4%, with a higher pooled estimate in developing than developed countries (9.1% vs 8.0%) [6]. Similarly, a global meta-analysis of IBS

estimated prevalence at 9.2% with Rome III and 3.8% with Rome IV, highlighting the major effect of diagnostic criteria on reported epidemiology [7]. The pathophysiology of DGBI provides a biological basis for the coexistence of symptoms arising from different gastrointestinal regions. Altered visceral sensory processing, impaired gastric accommodation, delayed or accelerated gastrointestinal transit, abnormal intestinal permeability, mucosal immune activation, microbiome alterations, and dysregulated gut-brain signaling may occur in overlapping combinations rather than as isolated abnormalities [1,8]. FD predominantly reflects disturbed gastric accommodation, hypersensitivity and impaired gastroduodenal sensorimotor function, whereas IBS is characterized by altered bowel motility, visceral hypersensitivity and abnormal central pain processing; importantly, these mechanisms can occur simultaneously in the same individual [8]. Consequently, FD and bowel disorders, particularly IBS, may represent clinically distinct manifestations of a shared DGBI pathophysiological spectrum.

Evidence from different regions demonstrates that such overlap is clinically important. In Bangladesh, a community-based study of 3,000 adults found IBS in 12.9%, FD in 8.3%, and FD-IBS overlap in 3.5%; notably, 27.1% of IBS patients and 42.1% of FD patients had overlapping disease [9]. In Australia, a clinical study using standardized Rome IV assessment found FD-IBS overlap in 64% of patients with a functional gastrointestinal disorder, compared with only 23% based on routine clinical documentation, suggesting that overlap is substantially under-recognized in everyday practice [10]. The findings establish a strong rationale for assessing the frequency of overlap between FD and functional bowel disorders in clinical settings, particularly in populations where gastrointestinal presentations may differ from those in high-income countries. This study aimed to determine the frequency of overlap between functional dyspepsia and functional bowel disorders in clinical settings.

METHODS & MATERIALS

This descriptive cross-sectional study was conducted from January 2023 to October 2023 at National Gastroenterology Institute and Hospital, Mohakhali, Dhaka, Bangladesh. Patients attending the out-patient department of medical gastroenterology in

NGLIH having evidence to support a diagnosis of DGBIP were included in the study. Consecutive sampling was used to recruit 595 patients among 2,227 out-door patients during the study period. Patients aged ≥18 years who presented with relevant gastrointestinal symptoms and were willing to participate and complete the Bengali Rome IV questionnaire were included in the study. Patients with previously established significant structural or organic gastrointestinal disease, severe systemic illness, inability to provide reliable information, or unwillingness to participate were excluded. Patients who fulfilled the predefined eligibility criteria were enrolled after obtaining informed written consent. Data were collected through face-to-face interviews using the Bengali version of the Rome IV questionnaire, along with a structured data collection form for relevant sociodemographic and clinical information. DGBI were diagnosed according to the Rome IV diagnostic criteria. Based on their symptom patterns, participants were categorized into functional dyspepsia (FD), functional bowel disorders (FBD), and overlapping FD-FBD groups. Patients with overlapping symptom profiles were classified according to the applicable Rome IV diagnostic criteria. The collected data were checked for completeness, coded, and entered into IBM SPSS Statistics version

26.0 for analysis. Descriptive statistics were used to summarize the demographic and clinical characteristics and the distribution of different DGBI categories and overlapping conditions. Ethical approval was obtained from the institutional authority, and confidentiality of participants' information was maintained throughout the study. Participation was voluntary, and informed consent was obtained from all participants before data collection.

RESULTS

The study population was predominantly composed of young and middle-aged adults, with a mean age of 34.81 ± 1.11 years. The largest proportion was within the 21–30-year age group (250, 42.0%), closely followed by those aged 31–40 years (249, 41.8%). Patients aged ≤20 years accounted for 45 (7.6%), while 48 (8.1%) were aged 41–50 years and only 3 (0.5%) were >50 years. Overall, 544 (91.4%) patients were aged 21–50 years, indicating that DGBI in this clinical population was concentrated predominantly among young and middle-aged adults. Males predominated markedly, comprising 399 (67.1%), compared with 196 (32.9%) females (Table I).

Table I
Sociodemographic characteristics of patients with DGBI (n=595).

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
≤20	45	7.6
21–30	250	42.0
31–40	249	41.8
41–50	48	8.1
>50	3	0.5
Mean age ± SD	34.81 ± 1.11	
Sex		
Male	399	67.1
Female	196	32.9
Total	595	100.0

Functional bowel disorders were overwhelmingly the most frequently represented anatomical category, occurring in 566 (95.1%) patients. Functional gastroduodenal disorders were identified in 359 (60.3%), while functional esophageal disorders affected 154 (25.9%). Functional anorectal disorders were comparatively uncommon, occurring in only 17 (2.9%) patients (Table II).

Table II
Distribution of DGBI types according to anatomical region (n=595).

DGBI type	Frequency (n)	Percentage (%)
Functional esophageal disorder	154	25.9
Functional gastroduodenal disorders	359	60.3
Functional bowel disorders	566	95.1
Functional anorectal disorder	17	2.9

Among individual DGBI diagnoses, functional dyspepsia was the most common, affecting 267 (44.9%) patients. IBS was the second most frequent diagnosis (174, 29.2%), followed by functional constipation (151, 25.4%) and functional diarrhoea (131, 22.0%). The distribution demonstrates a substantial burden of both gastroduodenal and bowel DGBI within the clinical cohort, with FD occurring in nearly half of all patients (Table III).

Table III
Frequency of the most common individual DGBI diagnoses (n=595).

Most common DGBI	Frequency (n)	Percentage (%)
Functional dyspepsia (FD)	267	44.9
Irritable bowel syndrome (IBS)	174	29.2
Functional constipation (FC)	151	25.4
Functional diarrhoea (FDr)	131	22.0

A clinically meaningful degree of overlap was observed between functional dyspepsia and functional bowel disorders. FD with IBS was the most frequent overlap, occurring in 87 (14.6%) patients. FD with functional constipation was present in 67 (11.3%), while FD with functional diarrhea occurred in 54 (9.1%). Thus, overlap involving IBS was approximately 1.3 times as frequent as FD-functional constipation overlap and 1.6 times as frequent as FD-functional diarrhea overlap (*Table IV*).

Table IV
Overlap between functional dyspepsia and functional bowel disorders (n=595).

FD–functional bowel disorder overlap	Frequency (n)	Percentage (%)
FD + IBS	87	14.6
FD + Functional constipation	67	11.3
FD + Functional diarrhoea	54	9.1

DISCUSSION

The present study identified 595 DGBI cases among 2,227 consecutive patients (26.7%) according to Rome IV criteria. The mean age was 34.81 ± 1.11 years, and males predominated (67.1%). In the Rome Foundation Global Epidemiology Study, Sperber et al. reported that 40.3% of 54,127 participants from 26 countries fulfilled criteria for at least one DGBI, while the global sample had a mean age of 44.3 years and an almost equal sex distribution, with 49.1% females [1,4]. The lower proportion of DGBI and younger age in the present clinical cohort may reflect differences in population composition and referral patterns, whereas the pronounced male predominance contrasts with the near-balanced sex distribution internationally. A 2024 meta-analysis of 256,915 participants from 40 countries found a pooled FD prevalence of 8.4%, falling to 6.8% with Rome IV, and reported higher prevalence in developing than developed countries (9.1% vs 8.0%) [6]. In this study, functional bowel disorders were present in 566 (95.1%), functional gastroduodenal disorders in 359 (60.3%), functional esophageal disorders in 154 (25.9%), and functional anorectal disorders in 17 (2.9%). Aziz et al., studying 5,931 adults in the United States, United Kingdom and Canada, found bowel disorders in 1,665 (28.1%), gastroduodenal disorders in 627 (10.6%), esophageal disorders in 414 (7.0%), and anorectal disorders in 440 (7.4%); importantly, 742 (36.0%) of the 2,083 participants with a DGBI had disorders involving more than one anatomical region [5]. Compared with those population findings, the present cohort had markedly greater bowel and gastroduodenal involvement, supporting the effect of clinical enrichment and the substantial regional overlap occurring in symptomatic patients. Sperber et al. further showed that among 54,127 respondents with Rome IV assessment, 68.3% had one

affected region, 22.3% had two, 7.1% had three, and 2.3% had four, with increasing overlap associated with higher symptom severity and poorer quality of life [4]. In this study, FD was the most frequent individual diagnosis (267, 44.9%), followed by IBS (174, 29.2%), functional constipation (151, 25.4%) and functional diarrhea (131, 22.0%). In Bangladesh, Perveen et al. found IBS in 12.9% (387/3,000) and FD in 8.3% (249/3,000) using Rome III criteria [9]. Oka et al. estimated global IBS prevalence at 3.8% using Rome IV and 9.2% using Rome III, demonstrating how diagnostic criteria substantially influence prevalence estimates [7]. The principal finding in this study was the coexistence of FD with functional bowel disorders: FD-IBS in 87 (14.6%), FD-functional constipation in 67 (11.3%), and FD-functional diarrhea in 54 (9.1%). Perveen et al. reported FD-IBS overlap in 3.5% of the Bangladeshi community, with 27.1% of IBS patients and 42.1% of FD patients having overlap [9]. In a tertiary clinical cohort, von Wulffen et al. found FD-IBS overlap in 64% by standardized assessment versus only 23% by routine clinical documentation, and overlap was associated with substantially greater symptom severity [10]. Nam et al. similarly identified FD-IBS overlap in 128 of 667 participants (19.2%) in Korea and found higher Hospital Anxiety and Depression Scale scores in the overlap group [11]. For constipation, Park et al. found FD in 80 of 759 patients (10.5%) with constipation [12]. Clinically, these overlaps are important because upper- and lower-gastrointestinal symptoms may be misattributed to a single disorder, contributing to incomplete symptom control and treatment dissatisfaction. The Asia-Pacific guidelines specifically recognize that overlapping symptom categories can negatively affect treatment outcomes and recommend management according to the predominant

and interacting symptom mechanisms rather than treating each syndrome in isolation [13].

LIMITATIONS

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

DGBI were common in this clinical cohort, with functional bowel disorders being the most frequent regional category and functional dyspepsia the most common individual diagnosis. A substantial overlap was observed between FD and functional bowel disorders, particularly FD-IBS (14.6%), followed by FD-functional constipation (11.3%) and FD-functional diarrhea (9.1%). These findings highlighted that overlapping DGBI may complicate symptom interpretation, contribute to incomplete treatment response, and increase patient dissatisfaction.

RECOMMENDATION

Routine assessment for overlapping DGBI, particularly functional dyspepsia with IBS or other functional bowel disorders, should be incorporated into clinical evaluation to improve diagnostic accuracy and guide individualized treatment. Clinicians should adopt a symptom-based, multidisciplinary approach with appropriate dietary, behavioral, and pharmacological interventions. Further multicenter and prospective studies involving larger populations are recommended to better characterize DGBI overlap patterns.

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CONFLICT OF INTEREST

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REFERENCES

1. Drossman DA. Functional gastrointestinal disorders: history, pathophysiology, clinical features, and Rome IV. *Gastroenterology*. 2016 May 1;150(6):1262-79.
2. Stanghellini V, Chan FK, Hasler WL, Malagelada JR, Suzuki H, Tack J, Talley NJ. Gastroduodenal disorders. *Gastroenterology*. 2016 May 1;150(6):1380-92.
3. Lacy BE, Mearin F, Chang L, Chey WD, Lembo AJ, Simren M, Spiller R. Bowel disorders. *Gastroenterology*. 2016 May 1;150(6):1393-407.
4. Sperber AD, Bangdiwala SI, Drossman DA, Ghoshal UC, Simren M, Tack J, Whitehead WE, Dumitrascu DL, Fang X, Fukudo S, Kellow J. Worldwide prevalence and burden of functional gastrointestinal disorders, results of Rome Foundation Global Study. *Gastroenterology*. 2021 Jan 1;160(1):99-114.
5. Aziz I, Palsson OS, Törnblom H, Sperber AD, Whitehead WE, Simren M. The prevalence and impact of overlapping Rome IV-diagnosed functional gastrointestinal disorders on somatization, quality of life, and healthcare utilization: a cross-sectional general population study in three countries. *Official Journal of the American College of Gastroenterology* | ACG. 2018 Jan 1;113(1):86-96.
6. Lee K, Kwon CI, Yeniova AÖ, Koyanagi A, Jacob L, Smith L, Lee SW, Rahmati M, Shin JY, Shin JI, Cho W. Global prevalence of functional dyspepsia according to Rome criteria, 1990–2020: a systematic review and meta-analysis. *Scientific Reports*. 2024 Feb 20;14(1):4172.
7. Oka P, Parr H, Barberio B, Black CJ, Savarino EV, Ford AC. Global prevalence of irritable bowel syndrome according to Rome III or IV criteria: a systematic review and meta-analysis. *The lancet Gastroenterology & hepatology*. 2020 Oct 1;5(10):908-17.
8. Van Oudenhove L, Levy RL, Crowell MD, Drossman DA, Halpert AD, Keefer L, Lackner JM, Murphy TB, Naliboff BD. Biopsychosocial aspects of functional gastrointestinal disorders: how central and environmental processes contribute to the development and expression of functional gastrointestinal disorders. *Gastroenterology*. 2016 May 1;150(6):1355-67.
9. Perveen I, Rahman MM, Saha M, Rahman MM, Hasan MQ. Prevalence of irritable bowel syndrome and functional dyspepsia, overlapping symptoms, and associated factors in a general population of Bangladesh. *Indian Journal of Gastroenterology*. 2014 May;33(3):265-73.
10. Von Wulffen M, Talley NJ, Hammer J, McMaster J, Rich G, Shah A, Koloski N, Kendall BJ, Jones M, Holtmann G. Overlap of irritable bowel syndrome and functional dyspepsia in the clinical setting: prevalence and risk factors. *Digestive diseases and sciences*. 2019 Feb 15;64(2):480-6.
11. Nam K, Kim N, Song HJ, Baik GH, Choi SC, Kim HJ, Lee JY, Park KS, Park SY, Park SJ. Gender difference in the overlap of irritable bowel syndrome and functional dyspepsia: a prospective nationwide multicenter study in Korea. *Journal of Gastroenterology*. 2021 Jun;56(6):537-46.
12. Park KS, Jee SR, Lee BE, Hong KS, Shin JE, Na SY, Kwon JG, Choi SC, Kim YS, Lee HS, Lee TH. Nationwide multicenter study for overlaps of common functional gastrointestinal disorders in Korean patients with constipation. *Journal of neurogastroenterology and motility*. 2017 Oct 30;23(4):569.
13. Gwee KA, Lee YY, Suzuki H, Ghoshal UC, Holtmann G, Bai T, Barbara G, Chen MH, Chua AS, Gibson PR, Hou X. Asia-Pacific guidelines for managing functional dyspepsia overlapping with other gastrointestinal symptoms. *Journal of Gastroenterology and Hepatology*. 2023 Feb;38(2):197-209.