RESEARCH

Prevalence of functional gastrointestinal disorders among consecutive new patient referrals to a gastroenterology clinic

Uday N Shivaji,¹ Alexander C Ford^{1,2}

¹Leeds Gastroenterology Institute, St James's University Hospital, Leeds, UK

²Leeds Institute of Biomedical and Clinical Sciences, Leeds University, Leeds, UK

Correspondence to

Dr A C Ford,
Leeds Gastroenterology Institute,
Room 125, 4th Floor, Bexley
Wing, St James's University
Hospital, Beckett Street, Leeds
LS9 7TF, UK;
alex12399@yahoo.com

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ABSTRACT

Objective Functional gastrointestinal disorders (FGIDs) are common in the community. Many patients will consult a physician in primary care, but the burden that these diseases represent to secondary care has not been studied for many years. We therefore examined this subject.

Design Unselected consecutive new adult patient referrals were recruited during a 3-year period from January 2010 until December 2012. Medical records were reviewed retrospectively and the following data were recorded: age and sex of the patient, symptoms reported or signs noted at the first consultation, all investigations requested and ultimate diagnosis after investigation to the level deemed appropriate by the consulting physician.

Setting A luminal gastroenterology clinic at a teaching hospital.

Results There were a total of 613 new patient referrals (mean age 54.2 years, 357 (58.2%) female). In total, 214 (34.9%) patients were diagnosed as having an FGID. Among the 214 patients diagnosed with an FGID, 65.9% were female, compared with 54.1% without an FGID ($p=0.005$). Mean age of those with an FGID was 47.9 years, compared with 57.5 years among those without ($p<0.001$). The total number of symptoms reported was significantly higher among patients with an FGID, but the total number of investigations did not differ.

Conclusions More than one-third of new patient referrals to a luminal gastroenterology clinic were diagnosed with an FGID. These conditions form a large part of the workload in secondary care gastroenterology, and primary care commissioning needs to reflect this.

extremely common in the community.^{1–11} A considerable proportion of people who report these symptoms will consult their general practitioner (GP) as a result,^{4 12–16} and may be referred on to see a gastroenterologist in secondary care. However, most of those who report upper and lower GI symptoms will have no obvious underlying structural explanation for these,^{17 18} and will be labelled as having one of the functional GI disorders (FGIDs), such as functional dyspepsia, irritable bowel syndrome (IBS), or chronic idiopathic constipation.

Understanding patterns of referral and the burden of FGIDs on secondary care, is vital in order to inform the commissioning of services by primary care. Previous work in this field has shown that up to 45% of patients seen in a secondary care gastroenterology clinic will ultimately be diagnosed as having an FGID.¹⁹ However, these data were published in 1983 and there have been few studies examining this topic in the intervening 30 years. During this time, the epidemiology of FGIDs might have changed, or GPs might have become more familiar with diagnosing and managing FGIDs, which might have altered the numbers of referrals of these conditions to secondary care. We therefore sought to examine this subject in a large number of consecutive new patient referrals to a general luminal gastroenterology clinic in secondary care.

METHODS

Participants and setting

The study was conducted among consecutive unselected patients aged

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INTRODUCTION

Symptoms referable to the upper and lower gastrointestinal (GI) tract are

≥16 years newly referred from primary care, for investigation of GI symptoms, to a general luminal gastroenterology clinic, which is run by one consultant gastroenterologist, assisted by two specialty registrars, at St James's University Hospital, Leeds. This is a large teaching hospital in a city in the north of England, providing secondary care services to a local population of almost 800 000 people.

Patients who were tertiary referrals from other hospitals outside the Leeds area were not eligible for inclusion in this study, to ensure that the prevalence of FGIDs was not overestimated and that people recruited into the study were representative of the local secondary care population. With this in mind, it is important to emphasise that the clinician whose patients were included in the study has no particular specialist area of expertise from a clinical perspective and is one of 10 consultant gastroenterologists in the hospital. The other nine consultants all receive a similar volume and type of unselected gastroenterology referrals from primary care. The relevant local research ethics committee in Leeds was approached and confirmed that ethics approval was not required for a retrospective study such as this.

Data collection and synthesis

All new patients referred during a 3-year period from January 2010 until December 2012 were identified from prospective data collected by the responsible consultant in clinic. Medical records of these patients were reviewed retrospectively, including clinic letters, which had been written using standardised templates, hospital notes, radiology results and histopathology results.

Data were recorded on to a predesigned Microsoft Excel spreadsheet (XP professional edition; Microsoft Corp, Redmond, Washington, USA) and included the age and sex of the patient, any GI symptom reported or sign noted at the first consultation, all investigations requested in order to elucidate the cause of the patient's symptoms or signs, results of all investigations and the final diagnosis. All patients had a routine panel of blood tests performed as standard, including full blood count, urea and electrolytes, liver and thyroid function, calcium, random blood glucose and C-reactive protein, unless these had already been requested by the referring GP.

Statistical analysis

The prevalence of any FGID, as well as individual FGIDs, was reported. Factors that predicted an FGID, including age, sex and symptoms or signs were evaluated. Categorical data, including sex and presence or absence of each symptom or sign, were compared between those with and without an FGID, using the χ^2 test. Mean age, together with a SD, was compared using an independent samples t test. Owing to multiple comparisons a two-tailed p value of <0.01 was

considered to be statistically significant. All statistical analyses were performed using SPSS for Windows V.19.0 (SPSS Inc, Chicago, Illinois, USA).

RESULTS

A total of 613 consecutive unselected new patients (mean age 54.2 years (range 16–97 years), 357 (58.2%) female) were referred to the clinic between January 2010 and December 2012 and provided data for the study. Of these, 245 (40.0%) patients were seen by the consultant at their initial clinic visit and 368 by a specialty registrar. The frequency of individual GI symptoms or signs is shown in table 1.

The commonest GI symptom or sign, reported by almost 30% of patients, was epigastric or upper abdominal pain. Other symptoms reported by >20% of referred patients included heartburn or regurgitation, diarrhoea, bloating or weight loss, with lower abdominal pain reported by 19.6% of patients. The maximum number of symptoms reported by a single patient was seven and the median number of symptoms reported by all 613 patients was two.

The frequency of various investigations, as requested by the consulting physician is provided in table 2. Commonest investigations requested were coeliac serology, upper GI endoscopy, colonoscopy and CT of the abdomen. A diagnosis was reached in only 23 (3.8%) patients without recourse to

Table 1 Frequency of individual symptoms and signs among 613 new patient referrals to a luminal gastroenterology clinic

Symptom or sign	Frequency (%)
Epigastric or upper abdominal pain	183 (29.9)
Diarrhoea	151 (24.6)
Heartburn or regurgitation	149 (24.3)
Weight loss	140 (22.8)
Bloating	140 (22.8)
Lower abdominal pain	120 (19.6)
Nausea	92 (15.0)
Anaemia	80 (13.1)
Vomiting	72 (11.7)
Dysphagia	65 (10.6)
Rectal bleeding	53 (8.6)
Constipation	37 (6.0)
Urgency	33 (5.4)
Alternating diarrhoea and constipation	31 (5.1)
Chest pain	18 (2.9)
Cough	16 (2.6)
Tenesmus	10 (1.6)
Haematemesis	10 (1.6)
Mucus per rectum	9 (1.5)
Melaena or dark stools	5 (0.8)
Proctalgia	4 (0.7)
Odynophagia	3 (0.5)
Abdominal mass	3 (0.5)

Table 2 Investigations requested among 613 new patient referrals to a luminal gastroenterology clinic

Diagnostic test	Frequency (%)
Coeliac serology	327 (53.3)
Upper GI endoscopy	253 (41.3)
Colonoscopy	160 (26.1)
Computed tomography of abdomen	102 (16.6)
Abdominal ultrasound scan	61 (10.0)
SeHCAT scan	49 (8.0)
Faecal elastase	44 (7.2)
Small bowel meal and follow-through	42 (6.9)
24 h pH and oesophageal manometric studies	32 (5.2)
Barium swallow	28 (4.6)
Glucose hydrogen breath test	24 (3.9)
Stool microscopy and culture	18 (2.9)
Gastric emptying study	17 (2.8)
Flexible sigmoidoscopy	16 (2.6)
Pelvic ultrasound scan	8 (1.3)
Anal manometric studies	8 (1.3)
Magnetic resonance enterography	7 (1.1)
Colonic transit studies	5 (0.8)
Defaecating proctogram	5 (0.8)
Barium meal	4 (0.7)
Capsule endoscopy	3 (0.5)

GI, gastrointestinal.

investigations, nine of whom had an FGID. The maximum number of investigations requested for a single patient was nine and the median number of investigations in all patients was two.

In total, 207 (33.8%) patients were judged to have an FGID after investigation to the level deemed appropriate by the consulting physician. A further seven patients had symptoms that were judged to be partially related to an FGID (two with diarrhoea-predominant IBS and erosive oesophagitis, one with diarrhoea-predominant IBS and peptic ulcer disease, one with functional dyspepsia and bile acid diarrhoea, one with functional dyspepsia and fatty liver disease, one with functional dyspepsia and Barrett's oesophagus, one with functional heartburn and fatty liver), resulting in a total of 214 (34.9%) referred patients who were ultimately diagnosed as having an FGID. Diagnoses among these patients are shown in table 3. IBS and functional dyspepsia were the commonest FGIDs diagnosed, occurring in 10.1% and 9.1% of all patients, respectively. There were 71 (11.6%) patients whose symptoms resolved without an apparent cause, who defaulted from further follow-up, or in whom a final diagnosis remained elusive after investigation. Finally, 328 (53.5%) patients who were found to have an organic cause for their symptoms.

Among the 214 patients diagnosed with an FGID, 141 (65.9%) were female. This compared with 216 (54.1%) women among 399 patients without an FGID ($\chi^2=7.91$, $p=0.005$). Mean age of those

Table 3 Frequency of individual FGIDs after investigation to the level deemed appropriate by the consulting physician among 613 new patient referrals to a luminal gastroenterology clinic

FGID	Frequency (%)*
IBS	62 (10.1)
Mixed stool pattern	18 (2.9)
Diarrhoea-predominant	34 (5.5)
Constipation-predominant	10 (1.6)
Functional dyspepsia	56 (9.1)
Functional abdominal pain	24 (3.9)
Functional heartburn	23 (3.8)
Functional bloating	16 (2.6)
CIC	7 (1.1)
Functional diarrhoea	7 (1.1)
Functional defaecation disorder	7 (1.1)
Cyclical vomiting syndrome	5 (0.8)
Functional chest pain	4 (0.7)
Globus	3 (0.5)
Miscellaneous other FGIDs	9 (1.5)

*More than one FGID diagnosed in nine patients.

CIC, chronic idiopathic constipation; FGID, functional gastrointestinal disorder; IBS, irritable bowel syndrome.

diagnosed with an FGID was 47.9 years, compared with 57.5 years for those without an FGID ($p<0.001$). The total number of investigations did not differ between those with and without an FGID (χ^2 for trend=4.25, $p=0.89$).

The total number of symptoms reported by patients was significantly higher among patients with an FGID, with 105 (49.1%) patients with an FGID reporting at least three symptoms, compared with 133 (33.3%) of those without an FGID ($p<0.001$). Symptoms and signs among those with an FGID compared with those without are shown in table 4. Patients with an FGID were significantly more likely to report epigastric or upper abdominal pain, bloating, lower abdominal pain, nausea, constipation, or alternating diarrhoea and constipation and significantly less likely to report weight loss or dysphagia, or to have been referred with anaemia than those without an FGID.

DISCUSSION

This study is the first to report the burden of FGIDs in a secondary care gastroenterology clinic in recent years. Almost 35% of new patient referrals from primary care were ultimately found to have an FGID after investigation. IBS and functional dyspepsia were the commonest FGIDs seen, occurring in almost 20% of referred patients. Those with an FGID were younger, more likely to be female and reported a greater number of individual GI symptoms than those without an FGID. Symptoms such as upper or lower abdominal pain, nausea, bloating, or alternating diarrhoea and constipation were much commoner in

Table 4 Frequency of symptoms and signs in 399 patients without an FGID and 214 patients with an FGID in a luminal gastroenterology clinic

Symptom or sign	No FGID (n=399)	FGID (n=214)	p Value*
Epigastric or upper abdominal pain (%)	94 (23.6)	89 (41.6)	<0.001
Diarrhoea (%)	103 (25.8)	48 (22.4)	0.35
Heartburn or regurgitation (%)	88 (22.1)	61 (28.5)	0.08
Weight loss (%)	113 (28.3)	27 (12.6)	<0.001
Bloating (%)	52 (13.0)	88 (41.1)	<0.001
Lower abdominal pain (%)	51 (12.8)	69 (32.2)	<0.001
Nausea (%)	47 (11.8)	45 (21.0)	0.002
Anaemia (%)	79 (19.8)	1 (0.5)	<0.001
Vomiting (%)	40 (10.0)	32 (15.0)	0.07
Dysphagia (%)	54 (13.5)	11 (5.1)	0.001
Rectal bleeding (%)	35 (8.8)	18 (8.4)	0.88
Constipation (%)	11 (2.8)	26 (12.1)	<0.001
Urgency (%)	15 (3.8)	18 (8.4)	0.02
Alternating diarrhoea and constipation (%)	13 (3.3)	18 (8.4)	0.006
Chest pain (%)	9 (2.3)	9 (4.2)	0.17
Cough (%)	10 (2.5)	6 (2.8)	0.83
Tenesmus (%)	4 (1.0)	6 (2.8)	0.09
Haematemesis (%)	9 (2.3)	1 (0.5)	0.10
Mucus per rectum (%)	6 (1.5)	3 (1.4)	0.92
Melaena or dark stools (%)	5 (1.3)	0 (0)	0.10
Proctalgia (%)	3 (0.8)	1 (0.5)	0.68
Odynophagia (%)	3 (0.8)	0 (0)	0.20
Abdominal mass (%)	3 (0.8)	0 (0)	0.20

*p Value for χ^2 .

FGID, functional gastrointestinal disorder.

those with an FGID, while alarm symptoms or signs such as weight loss, dysphagia, or anaemia were significantly less common.

A strength of this study is the inclusion of all consecutive unselected new patient referrals from primary care and the exclusion of tertiary referrals from other hospitals, meaning that the results are more likely to be generalisable to luminal gastroenterology clinics in secondary care. In addition, patients were identified prospectively, clinic letters were standardised in order to record pertinent information for future retrospective data extraction and results of all investigations were obtained. Thus, the validity of the dataset is likely to be relatively high.

Weaknesses of this study are, first, that we did not collect data prospectively and that symptom data were extracted from clinic letters dictated at the initial referral visit, rather than by administration of a validated questionnaire to all patients at their appointment. Second, we did not use the current 'gold standard', the Rome III criteria, to define the presence of each of the FGIDs, but rather a physician's opinion. This approach could be criticised, although

the Rome III criteria have only been validated for IBS,²⁰ their performance in distinguishing between true IBS and organic disease is modest and there is good evidence to suggest that few primary care physicians have either heard of, or use, such symptom-based diagnostic criteria.^{21–22} Third, the final diagnosis was reached after investigation to a level deemed appropriate by the consulting physician, so it is possible that some organic disorders were missed among those who were ultimately labelled as having an FGID. Finally, although the consultant operating in this clinic does not have an area of particular clinical expertise, we cannot exclude the possibility that the patients referred were not representative of all patients referred from primary care to other secondary care luminal gastroenterology clinics in the hospital.

This study demonstrates that FGIDs still account for a considerable proportion of the total workload of a luminal gastroenterologist operating in the outpatient clinic. Although the overall proportion is slightly lower than that reported by Harvey *et al* in 1983,¹⁹ it is of a similar magnitude. The slight reduction in FGIDs might be due to the greater level of diagnostic testing that has become available in the intervening 30 years, meaning that fewer organic GI disorders are missed, or might be due to increasing confidence among GPs in the management or recognition of FGIDs, such that more patients with an organic GI disorder are being referred appropriately from primary care. However, it should be noted that in Harvey's study, patients referred straight to endoscopy were excluded from the analysis, which might have reduced the overall prevalence of organic disease.

As has been reported previously,^{8–10,23} those with FGIDs were younger and more likely to be female than those without. In addition, the number of symptoms reported by those with an FGID was significantly higher among patients with an FGID. Several symptoms were more likely to be reported by those with an FGID, such as abdominal pain, nausea, bloating and constipation, while alarm symptoms or signs such as weight loss, dysphagia and anaemia were less common. This is in contrast to the systematic review literature,^{8–23–28} which suggests that using individual symptoms to discriminate between functional and organic GI disorders is an approach that is fraught with difficulty. The significantly lower prevalence of some of these alarm features in those with an FGID supports their use in diagnostic criteria to define FGIDs.^{29–30} However, it should be noted that as many as 1 in 10 patients with FGID reported some of these alarm symptoms or signs.

With over one-third of patients seen in a secondary care gastroenterology clinic being diagnosed with an FGID after investigation, the results of this study have significant implications for service provision and commissioning in both primary and secondary care. First, given that many of the FGIDs, such as functional

dyspepsia, functional chest pain, chronic idiopathic constipation and IBS, have a similar prevalence in the population in the community,^{5 8 10 31} the difference in the prevalence of each within this secondary care population suggests that there are certain FGIDs that GPs are more comfortable managing than others. Further education of GPs about how to diagnose these conditions and effectively manage the symptoms reported by patients, might therefore lead to a reduction in the numbers of patients referred. Second, the high volume of patients with FGID being seen in secondary care has implications for the provision of services, including business cases for nurse specialists and improving access to alternative treatments, such as psychological treatments. Third, gastroenterologists in secondary care need to become better at recognising FGIDs, in order to reduce the need for unnecessary investigations. Our study suggests that in addition to the use of accepted diagnostic criteria, the number and nature of symptoms reported may predict the presence of an FGID.

In summary, this study has demonstrated that over one-third of patients referred to a general luminal gastroenterology clinic are ultimately found to have an FGID. IBS and functional dyspepsia were the commonest FGIDs seen in this secondary care clinic. These results serve to confirm the magnitude of this problem 30 years after the initial report by Harvey *et al* and highlight the fact that this has significant implications for service planning and commissioning in both primary and secondary care.

Contributors UNS and ACF conceived and drafted the study. UNS collected all data. ACF analysed and interpreted the data. ACF drafted the manuscript. Both authors approved the final draft of the manuscript.

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