ABSTRACT

The clinical and economic implications of chronic constipation (CC) and irritable bowel syndrome (IBS) and their negative impact on quality of life are considerable. Both of these functional gastrointestinal disorders produce frequent and bothersome symptoms of varying severity and account for limitations in performing daily activities, higher healthcare costs, increased utilization of medical resources, reduced productivity at work, and diminished quality of life. Although there is some overlap of symptoms in CC and IBS, there are differences in epidemiology, diagnostic criteria, predominant symptoms, and treatment. This article addresses these similarities and differences, focusing on prevalence, demographics, economic burden, and resource utilization patterns. It also takes a careful look at the impact of CC and IBS on quality-of-life assessment measures and identifies which factors predict lower scores and reduced quality of life. (Adv Stud Med. 2006;6(2A):S49–S57)

CHRONIC CONSTIPATION

EPIDEMIOLOGY AND PREVALENCE

Although the overall prevalence of CC in the United States ranges from 2% to 28%, studies have found that it is more common in women (16%) than in men (12%). Some studies have found that it is more common in those individuals older than 65 years of age, with a prevalence rate of 25%; but others have found similar rates of 26% to 29% in all adult groups. Patients older than 65 years are 3 times more likely to consult a physician for CC than younger patients, and patients in...
lower socioeconomic groups are more likely to self-report CC than those in higher income brackets.13

Studies examining the effect of gender on the prevalence of CC have found that outlet type constipation is the most common subtype in women,9 functional constipation is the most common subtype in men,9 outlet type and IBS-outlet type constipation are twice as common in women than in men,9 and severe constipation (ie, 2 bowel movements a month) generally occurs in women only.14 Studies examining the effect of race have found that CC is more common in non-whites—African Americans, Native Americans, Asians, and Hispanics—than in whites.9,12

There is a significant overlap among FGIDs, with many patients reporting symptoms of 2 or more of these disorders. This is not surprising, given that 29% of patients with GERD and dyspepsia also have CC, and the diagnosis can shift from one FGID to another over time.1,15 This shift suggests that FGIDs may have a common pathophysiologic mechanism.16

**Etiology and Diagnostic Criteria**

There are numerous secondary or organic causes of constipation, including inadequate fluid and fiber intake, physical inactivity, eating disorders, depression, various drugs, abdominal or pelvic surgery, colorectal surgery, pregnancy, and a large number of GI, metabolic/endocrine, systemic, and neurological disorders.17-20 However, CC is due to 3 functional causes—normal-transit constipation, slow-transit constipation, and disorders of defecatory or rectal evacuation,21 with 1 or more of these mechanisms contributing to CC in a given patient.

The Rome II criteria for chronic functional constipation (Table 1) have been widely used to establish the diagnosis.20 However, an American College of Gastroenterology Task Force recently proposed that a broader definition of CC be used for diagnosis (Table 2).21

**Symptoms and Quality of Life**

Symptoms associated with CC and constipation-predominant IBS include straining, hard or lumpy stools, fewer than 3 bowel movements per week, a feeling of incomplete evacuation, bloating and abdominal distention, and abdominal pain and/or discomfort.20,22 However, because bloating and pain or discomfort are more common in constipation-predominant IBS than in CC, they are most helpful in differentiating between the 2 disorders.

Nevertheless, patients with either disorder find these symptoms to be frequent and bothersome. In a survey of 10 000 adults, the average number of days per year with these symptoms ranged from 71 for abdominal discomfort in those patients with CC to 137 for hard stools in those with constipation-pre-

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**Table 1. Rome II Criteria for Chronic Functional Constipation**

2 or more of the following symptoms for 12 weeks, which need not be consecutive, in the preceding 12 months

- Straining during >25% of bowel movements
- Sensation of incomplete evacuation for >25% of bowel movements
- Sensation of anorectal blockage for >25% of bowel movements
- Manual maneuvers to facilitate evacuation for >25% of bowel movements
- <3 bowel movements/week

Loose stools are not present

Insufficient criteria for the diagnosis of IBS (ie, no abdominal pain/discomfort)

No organic disorder responsible for CC symptoms is present

CC = chronic constipation; IBS = irritable bowel syndrome.

Data from Thompson et al.20

**Table 2. Proposed Broad Definition of Chronic Constipation**

Unsatisfactory defecation characterized by infrequent stools, difficult passage, or both

Difficult passage includes:

- Straining
- A sense of difficulty passing stool
- Incomplete evacuation
- Hard/lumpy stools
- Prolonged time to pass stool
- Need for manual maneuvers to pass stool

Some combination of these symptoms should be present for at least 3 of the previous 12 months

Data from Brandt et al.21
dominant IBS. Both groups reported between 101 and 133 days for straining and bloating. In addition, 52% of those patients with CC and 68% of those with constipation-predominant IBS reported that their symptoms were very or extremely bothersome.

Interestingly, a study of 1149 patients with CC found that infrequent bowel movements (<3/week) was the least commonly reported symptom (36%). The most commonly reported symptom was straining (81%), followed by hard stools (72%), incomplete evacuation (54%), and abdominal bloating (37%).

Given the frequency and chronic nature of symptoms, it is not surprising that quality-of-life scores for the physical health and mental health components of the Health-Related Quality of Life (HRQOL) assessment tool are significantly lower in patients with CC than in healthy subjects.

**RESOURCE UTILIZATION AND ECONOMIC BURDEN**

Constipation accounts for 2.5 million physician visits annually in the United States, with 31% of these visits to family practitioners, 20% to internists, 15% to pediatricians, 9% to surgeons, 9% to obstetrician-gynecologists, 4% to gastroenterologists, and 12% to other physicians and health providers. Constipation also accounts for 13.7 million days of restricted activity and 3.4 million days of bed disability each year, and more than $400 million in annual expenditures for over-the-counter laxatives. In addition, the average cost of evaluating constipation in a tertiary care setting is $2752 per patient.

**IRRITABLE BOWEL SYNDROME**

The Rome II definition of IBS includes a temporal requirement and clinical features. Abdominal discomfort and/or pain must be present for at least 12 weeks, which need not be consecutive, in the preceding 12 months, and accompanied by 2 of the following 3 features: relief with defecation and/or an abnormal change in stool frequency (ie, <3 bowel movements per week or >3 bowel movements per day) and/or an abnormal change in stool form or appearance (ie, loose, watery stools or hard, lumpy stools).

**EPIDEMIOLOGY AND PREVALENCE**

The prevalence of IBS in the United States ranges from 9% to 20%, with rates of 8% to 10% cited most frequently. Prevalence in other countries varies widely, from 4% in China to 12% in Canada, and between 8% and 22% in several European countries and the United Kingdom. This variation is because of differences in the surveys, the populations surveyed, and the criteria used to diagnose IBS.

The overall prevalence of IBS appears to decline with age, but it is higher in females than in males for all age brackets, and for constipation-predominant and alternating constipation-diarrhea subtypes. Only in diarrhea-predominant IBS is the prevalence the same in men and women.

Irritable bowel syndrome accounts for 12% of diagnoses in primary care practice and 28% of diagnoses in gastroenterology practice, and peptic disease accounts for 20% of the remaining diagnoses, other GI disorders for 15%, inflammatory bowel disease for 14%, other functional disorders for 13%, and liver disease for 10%. Patients with IBS are also significantly more likely to consult physicians than those without IBS, not only for GI symptoms but also for non-GI symptoms. One explanation for the latter is the high prevalence of extraintestinal symptoms in patients with IBS, including fibromyalgia, chronic fatigue syndrome, migraine, and interstitial cystitis.

**QUALITY OF LIFE**

The impact of IBS on quality of life is considerable. As shown in Figure 1, IBS reduces quality of life, as measured by the 8-component Short Form (SF-36) of the HRQOL, to a greater degree than migraine or asthma. IBS also has a negative impact on daily activities and work, which not only reduces quality of life but also adds to the economic burden. In a survey of 287 patients with IBS, 46% cut back on workdays, 30% missed at least 1 workday in the previous 4 weeks, 15% worked fewer hours, 12% switched to working at home, 12% lost a job or quit working, 9% changed jobs for health reasons, and 8% modified their schedules.

Clinical predictors of reduced quality of life in patients with FGIDs include GI symptom severity, presence of extraintestinal symptoms, psychological stress, adverse life events, chronic social stress, and lack of social support. The lack of social support, in particular, is not always addressed in clinical practice.

A study using a large database of patients with IBS examined HRQOL physical health and mental health component scores and found several clinical predictors of reduced scores in each component. The predictor...
causing the greatest reduction in physical component score was more than 5 visits to a physician, followed by tiring easily, low energy, severe symptoms, painful symptoms, and symptom flares lasting more than 24 hours. The predictor causing the greatest reduction in mental component score was feeling tense, followed by feeling nervous, feeling hopeless, sleep difficulties, tiring easily, low sexual interest, and interference with sexual function.

Four studies have evaluated the effect of IBS treatment on HRQOL scores. One study assessing leuprolide (Lupron; TAP Pharmaceuticals, Lake Forest, Ill) versus placebo for abdominal pain and nausea in women with functional bowel disease found that treatment improved HRQOL scores compared to placebo. A study assessing cognitive behavioral therapy or desipramine (Norpramin; Aventis Pharmaceuticals, Bridgewater, NJ) showed a trend for improvement in IBS-specific HRQOL scores with treatment. A report of 2 studies of alosetron (Lotronex; GlaxoSmithKline, Research Triangle Park, NC) in patients with diarrhea-predominant IBS found that it improved IBS-specific HRQOL scores. A study comparing multicomponent behavioral therapy plus standard medical treatment to standard medical treatment alone in IBS found that multicomponent behavioral therapy plus standard medical treatment improved quality of life, but standard medical treatment alone did not.

A conceptual model of quality of life in FGIDs (Figure 2) illustrates how various risk factors for IBS and disease variables, such as distress and GI symptom severity, affect each other and, ultimately, quality of life. Although quality of life appears to be driven more by distress than by symptom severity in patients with IBS, symptom severity appears to be the major driver of quality of life in patients with inflammatory bowel disease.

The model, which can be applied to other disease states, also provides a framework for future epidemiologic and quality-of-life studies in patients with FGIDs. Additional data are needed to determine race- and gender-related differences in epidemiology and quality of life, and to assess patients who consult
ECONOMIC IMPACT AND RESOURCE UTILIZATION

The economic impact of IBS is considerable. Annual direct costs have been estimated at $1.6 billion, with 500,000 inpatient hospitalizations accounting for nearly $1 billion, 3.65 million office visits accounting for $228 million, and 87,000 emergency room visits accounting for $13 million. Medication and outpatient visits to the hospital account for the remaining $115 million. Annual indirect costs associated with lost workdays because of healthcare visits were $205 million.

Studies of patients with IBS in a health maintenance organization found that total healthcare costs were 50% higher for these patients than for controls, visits for ambulatory care but not inpatient services were higher in these patients, costs were higher for those patients with moderate and severe IBS, and most of the excess costs were because of costs associated with non-GI complaints. Furthermore, a study of Medicaid patients with “irritable colon” found that mean costs were 48% to 59% higher in these patients than in controls, costs were attributable to ambulatory care, and expenditures were not affected by race or gender, but they were higher in patients 41 to 65 years of age.

CONCLUSIONS

Chronic constipation and IBS are associated with frequent and bothersome symptoms, increased resource utilization and economic burden, and diminution of quality of life. Although there is some overlap of symptoms, there are differences between CC and IBS with respect to epidemiology, diagnostic criteria, predominant symptoms, and treatment. Chronic constipation and IBS are more common in women, with the gender disparity more pronounced in women with IBS, particularly those with constipation-predominant IBS. Although some studies have found that CC is more common in older patients, other studies have found no difference on the basis of age. By comparison, IBS appears to be less prevalent in older patients.

Additional studies are needed to determine differences in epidemiology and effects on quality of life in patients with CC or IBS, and to determine if factors predicting HRQOL can also predict other clinically significant outcomes, such as resource utilization, satisfaction with medical care, and specific treatment responses.

DISCUSSION

Dr Lee: Are there any data on the economic impact of constipation-related complications, such as hemorrhoids, rectal prolapse, and anal fissures?

Dr Rao: There are some numbers on the burden of illness, but they only give you a glimpse of what may be going on. Unless complications of constipation are evaluated systematically in large prospective epidemiologic surveys, we will never get a true picture of how much it’s going to cost for hemorrhoids, rectal prolapse, anal fissures, and so on.

Dr Lee: I was intrigued by the finding that non-whites from lower socioeconomic groups are more likely to self-report constipation. I have not found that to be so in my clinical experience. Why do you think that is?

Dr Chang: I’m not sure anyone knows. It may be a difference in diet, maybe a low-residue diet, that’s leading to more constipation.

Dr Lee: Do you think that functional constipation is more of a problem in industrialized nations as opposed to other areas?

Dr Chang: My impression is that constipation is a common symptom. It’s whether you’re going to report it, or if you feel that it’s severe enough to bring it up. Many patients aren’t comfortable talking about it, or they try to manage it on their own with dietary changes, over-the-counter remedies, or even alternative remedies. In lower socioeconomic populations, in which there’s a high prevalence of diabetes and hypertension, constipation is lower on the list of things to worry about.

Dr Rao: Constipation is a global disorder. Having practiced in 3 different countries on 3 different continents, I can tell you that I’ve seen the same prevalence of constipation all over the world. It has just not been well documented and reported in different parts of the world. The IBS literature is better in that regard, with the prevalence truly based on reported studies in all
Dr Chang: Chronic constipation is somewhat confusing. There's so much overlap, and there are so many different definitions. Chronic constipation may be referring to outlet constipation, functional constipation, or IBS with constipation. In some cases, it can be hard to differentiate and tease out the different causes of constipation, and that's a challenge.

Dr Hasler: I agree. We've often been investigating the wrong things. The literature on therapy for constipation focuses on increasing stool frequency and other similar parameters, but judging from my practice, infrequent defecation is relatively uncommon. Most patients complain of difficulty with evacuation or incomplete evacuation. Very few clinical trials address these issues to the same degree that they address stool frequency.

Dr Bharucha: In constipated patients who do not have pelvic floor dysfunction, the Rome criteria differentiate IBS from functional constipation by symptoms alone. However, there are no known differences in the pathophysiology or management of functional constipation and constipation-predominant IBS. The Rome II criteria include painful constipation (i.e., patients with constipation that is not associated with a change in stool form or frequency but whose abdominal pain is not relieved by a bowel movement) in the same category as "painless" constipation, in which patients have constipation but no abdominal pain.

In a recently completed population-based study in Olmsted County, we compared the clinical features of painful versus painless constipation in unselected women in the community. Women with painful constipation reported worse general health and more urinary urgency, and had a higher prevalence of hysterectomy than those with painless constipation. Patients with painful constipation more closely resembled those with constipation-predominant IBS than they resembled those with functional constipation.

Therefore, consideration should be given to separating painful constipation from painless constipation in the Rome criteria and in therapeutic trials.

Dr Lembo: Most patients I see have some discomfort associated with their constipation, and if you delve into their symptoms, many of them meet the Rome criteria for IBS, which highlights the fact that there is significant overlap between IBS and chronic constipation.

Dr Chang: In an IBS clinical trial, it's probably easier to enroll all patients with IBS with constipation predominance because there are required criteria for abdominal pain and/or discomfort. If you're going to do a chronic constipation trial, it's going to be difficult to separate the patients who have an overlap with IBS with constipation. However, I'm not sure it's that important because most drugs that are going to help constipation in general are going to help either group.

Dr Hasler: The one exception is that most therapies for constipation are designed to stimulate defecation, thus they may not take care of some of the pain or bloating associated with IBS. However, a patient with true slow-transit CC who doesn't have a lot of associated symptoms might actually have an excellent response to that form of therapy.

Dr Schnelle: What is the thinking about the increased prevalence of constipation in the elderly and why was there no information about the prevalence of constipation in nursing home residents? My view is that the prevalence of constipation among incontinent nursing home residents is approximately 60% or 70%. Most of these patients have a long-term history of using laxatives. Therefore, how does that fit into the definition of constipation if somebody has been using laxatives for 2 or 3 years? They may have more than 2 or 3 bowel movements a week, but they seem to be completely stimulated by as-needed laxatives.

Dr Chang: Your last point is important. You're assuming that if they're using laxatives, they have constipation. That's not always true. I try to get a symptom history for IBS and functional constipation without the influence of medications, but some patients have been on medications for so long they can't recall their history without them. I don't think it's accurate to say someone is an alternator if they have diarrhea but get constipated because they're taking an antidiarrheal agent, or they have diarrhea because they actually have constipation-predominant IBS and are taking a laxative.

Constipation is quite common in the elderly, but there are probably different mechanisms. There are definitely differences in autonomic responses that affect motility, and there are comorbid conditions that may decrease physical activity and be associated with constipation. There are also other variables and medications that explain why the elderly or nursing home patients have constipation.

Dr Leung: In many instances, nursing home residents have a primary provider who sends the patient to the nursing home. The Washington Manual says...
that patients confined to a bed in a hospital or nursing home need to be given something to prevent constipation. Thus, patients are on laxatives for as long as they are in a hospital or a nursing home, regardless of what their bowel habits had been before admission.

**Dr Schnelle.** What happens if you phase out laxatives in somebody who has been using them for 1 or 2 years? What can we expect if we did that?

**Dr Lembo.** We did a study of nursing home residents who did not have complaints of constipation at the time of their admission to the nursing home. We found that the development of constipation at 3, 6, and 12 months after admission correlated with comorbid conditions, dementia, and decreasing ambulation—factors that affect gut function and the ability to defecate normally.

**Dr Rao.** The prevalence of constipation in the elderly is controversial, and it depends on how you define it. In a recent paper, Johanson et al struggled to define the prevalence in the elderly. I don't think they could say conclusively that there was a much higher prevalence, although we all accept that there is a higher prevalence. However, neither the study of Paré et al nor the study of Stewart et al showed a higher prevalence in the elderly.9,11

Is it because of the way the studies were performed, the way the questionnaires were administered, or how the questions were asked? Is it because the nursing home population was probably completely cut out of the questionnaires? The jury is still out with regard to the true prevalence of constipation in the elderly. That is an area that should be investigated.

**Dr Chang.** The age threshold for elderly should be changed because I don't think many people would consider 64 or 65 years as being elderly. There are many individuals in their mid and late 60s who are healthy and very active. The average age in the nursing home population has got to be much older.

**Dr Schnelle.** The average age is in the 80s.

**Dr Lembo.** I agree that the jury is still out, but I think the overwhelming evidence still points toward more symptoms of constipation in the elderly, particularly pelvic floor. Most studies show that the elderly are using more laxatives, bulking agents or osmotic or other types of laxatives, than their younger counterparts. For example, in a well-conducted “door-to-door” survey of 209 people aged 65 to 93 years, 30% of men and 29% of women described themselves as constipated at least once a month.50

**Dr Bharucha.** The answer to this question partly depends on what population you are considering and how constipation is defined. Among elderly nursing home patients with underlying medical conditions and physical inactivity, the prevalence of constipation is probably higher than it is in the community. In a 1996 study of community-dwelling adults in Olmsted County, the prevalence of constipation was higher in subjects aged 65 years and older than that seen in a previous study of community-dwelling middle-aged subjects.10,51 However, in our recently conducted study in Olmsted County, we confirmed what the Paré et al study found—the prevalence of constipation among women aged 20 to 80+ years living in the community was not significantly associated with age.11,48

Prevalence is also influenced by the criteria used to define constipation (ie, self-reported constipation, established symptom criteria, or laxative use). The overall prevalence of constipation among the elderly using any of these criteria was 40%, with approximately 25% of elderly subjects reporting laxative use.

When you ask people who are taking laxatives every day whether they're constipated and they say, “No, we are not. We don't have any symptoms,” you should specify, “Please answer with regard to bowel movements you would have if you were not taking laxatives.” Whether they take that into account is a different question.

**Dr Rao.** One of the large unmet needs among patients is a chance to discuss constipation with their physicians. This involves educating our colleagues in primary care about constipation, its burden, and its treatment in a primary care setting.

**Dr Lee.** Another place for education is our residency training programs. We're all asked to speak on Zollinger-Ellison syndrome, or some other relatively rare disorder, but we should be paying more attention to constipation, which is a major problem for many of the patients that our residents and fellows are going to be treating. It's difficult to convince them how important it is because they're so steeped in the acute nature of the medical care that's required in a tertiary care hospital. Managing chronic constipation isn't as exciting, if you will, as managing an acute myocardial infarction, but it's important because it's common and often overlooked.
REFERENCES


