Clinical economics review: irritable bowel syndrome

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SUMMARY

The ubiquitous nature of irritable bowel syndrome (IBS), coupled with a lack of good treatment options, has created the impression that the condition must represent a large drain on health-care resources. The literature certainly appears to support this view but is largely based on patients seen in referral centres (10–15%) and it may not be appropriate to extrapolate these data to the IBS population as a whole (85–90%).

In addition to reviewing such literature that exists on the economics of IBS, this paper contains some new data, which suggest that the direct costs of the condition, certainly in the UK, may not be quite as high as has previously been assumed. This may be partly due to factors such as the low cost of the drugs used to treat the condition and the tendency for many patients to stop consulting because of disenchantment with the inadequacies of current therapy. Conversely, the indirect and intangible costs of the disorder appear to be much greater, but these burdens obviously do not have such an impact on those responsible for purchasing and providing health care for IBS sufferers.

Paradoxically, if a new, effective therapy for IBS were forthcoming, the situation could change dramatically, especially if it involved a new drug. Any such agent would inevitably be more expensive than anything available today, leading to a potentially dramatic escalation in the direct costs of this disorder.

INTRODUCTION

Health economics and measurement of quality of life are relatively new arenas for most clinicians, but have rapidly assumed considerable importance in modern medicine. Where a disease and its therapy are well-defined, calculating the costs of that disorder is a relatively straightforward exercise. Unfortunately, this is not the case in IBS and many of the assumptions being made about its economic impact are based on remarkably sparse information.

Irrespective of the perspective from which it is viewed, the subject of IBS is full of hidden pitfalls ready to mislead the unwary. Diagnostically, the absence of a confirmatory test necessitates total reliance on the correct recognition of symptom patterns, which on some occasions can mimic serious gastrointestinal and non-gastrointestinal diseases. From the patient's standpoint, symptom severity between individuals can range from trivial to incapacitating, with the latter having a major impact, particularly on social and economic functioning. Furthermore, within the same person, symptoms can exhibit considerable fluctuation, and we still have no standardized means of assessing these changes. Lastly, it is well-known that a proportion of patients with this extremely common condition become chronic hospital attenders who are submitted to multiple investigations and often fail to respond to a wide variety of therapeutic procedures, sometimes even of a surgical nature.

It is the purpose of this paper to review the currently available data on the subject, add some new information and suggest directions for future research.

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PREVALENCE OF IBS

The ambiguity in defining IBS is a major obstacle to accurately determining its true prevalence. Consensus is gradually being reached about which symptoms are necessary and how often they need to be experienced before a diagnosis can be made. However, much of the current epidemiological data are based on varying definitions, classification systems that may not agree and populations that have often been 'selected' in a variety of ways (Table 1).

Table 2 lists some of the most recent prevalence studies for IBS and highlights the variation in estimates by definition, source and population. For studies using terms that may or may not be exclusively IBS, estimates for the US population range from 0.8% reporting spastic colon in the past 12 months[1] to 5.8% reporting ever having had functional colonic problems.[2] Studies that have used one or more symptoms to define IBS report a

Table 1. Possible impediments to estimating IBS prevalence

Issue	Example
Various definitions	One or more terms (e.g. spastic colon, mucous colitis, etc.)
	One or more symptoms (e.g. bloating, abdominal pain, etc.)
Classification systems that may not agree	Manning criteria[49]
	Visible abdominal distention, pain relieved by bowel action, more frequent stools with the onset of abdominal pain and looser stools with the onset of pain. Two additional symptoms are often included: rectal passage of mucus and sensation of incomplete evacuation.
	Rome criteria[50]
	At least 3 months of abdominal pain/discomfort relieved by defecation or associated with change in frequency or consistency of stool and two or more of the following at least a quarter of the time: altered stool frequency, form, or passage of mucus, bloating, or a feeling of distention.
Various sources of data	Patient self-reported
	Physician diagnosed
	Physician medical records
Population-dependent	Consulters
	Non-consulters
	Demographic groups
	Geographical groups
	Convenience populations (e.g. students)

prevalence range by sex of 18–54% for men and 32–66% for women in Denmark;[3, 4] 2–16% for men and 3–25% for women in the UK;[5] and 3–16% for men and 8–9% for women in the US.[6] Even when the definition of IBS is limited to a more specific criteria, there are wide ranges across populations. For example, prevalence estimates for studies using the Manning criteria have estimated IBS prevalences of 9% (the Netherlands),[7] 20% (USA),[8–10] 22% (UK),[11] 25% (Japan)[7] and 44% (Nigeria).[12] The range of prevalence estimates in US studies using the Rome criteria is not as broad due to the more stringent definition and similar population base.[13, 14]

Regardless of whether IBS affects 5 or 25% of a population, the rate is substantial, particularly when compared with prevalence rates for other disease states,[15] such as asthma (5% in USA), diabetes (3% in USA), heart disease (9% in USA) and hypertension (11% in USA). Among digestive diseases, IBS is the seventh most common diagnosis given in a US office-based setting,[16] but is the leading gastrointestinal disorder seen by gastroenterologists, with suggestions from some now rather dated studies, that it accounts for up to 50% of their workload.[17–19] A more recent postal survey of consultant gastroenterologists in the north of England undertaken for this review revealed that 36% of new patients had IBS; this somewhat lower value may reflect a tendency for modern gastroenterologists to refine the diagnosis of functional bowel disorders more than their predecessors.

THE ECONOMICS OF IBS

The prevalence data for IBS, coupled with the workload it imposes on gastroenterologists, would at first sight indicate that the condition may be expected to represent a major economic burden on society. The reality is, however, that there are few data to support this view. This is explained by the difficulties of accurately diagnosing IBS and by the fact that the economic attention given to gastroenterology in recent years has focused almost exclusively on the costs of managing duodenal ulcer disease. The latter is not surprising given that ulcer-healing drugs account for almost 10% of total NHS expenditure on medications in the UK.[20] The few studies that have addressed the economics of IBS are most appropriately described as only partial analyses and a comprehensive assessment of the cost profile of the disorder has yet to be reported in the literature.

Table 2. Prevalence of IBS by definition, source and population for selected studies

Study	Definition	Source	Population	Prevalence estimate
LeClere et al. 1992[2]	Ever had a functional colon conditon	Patient self-report	US – data from Digestive Disorders Supplement of the National Health Interview Survey 1989; age 18 or older (N = 42 392)	10 million
LeClere et al. 1992[2]	Functional colon condition in past 12 months	Patient self-report	US – data from Digestive Disorders Supplement of the National Health Interview Survey 1989; age 18 or older (N = 42 392)	7 million composed of the following: spastic colon (39.2%); IBS (30.6%); irritable colon (14.8%); functional bowel (1.4%); other (14.8%)
Sandler 1990[1]	Ever told by physician had spastic colon or mucous colitis	Patient self-report	US – data on age 12–74 (N = 18 447) from 1976–80 National Health and Nutrition Examination Survey II	2.6 million or 15.8/1000
Sandler 1990[1]	Spastic colon in past 12 months	Patient self-report	US – data from 1987 National Health Interview Survey (N = 122 859)	1.3 million
Kay et al. 1994[3]	Symptoms of IBS	Patient self-report	Denmark – random sample of adults age 30, 40, 50, 60 (N = 2987)	Prevalence of IBS defined as two of three symptoms (pain with defecation, distention/borborygmi, altered stool consistency) was 54% for men and 66% for women; for all three symptoms prevalence was 46% and 55% respectively
Thompson & Heaton 1980[51]	Symptoms of IBS	Patient self-report	UK – naval technicians and nurses, patients in a clinic and nurses, elderly people in flats (N = 301)	13.6% had symptoms consistent with spastic colon
Danivat et al. 1988[52]	Symptoms of IBS	Patient self-report	Thailand – adults from two rural farming villages (N = 401) and employees from a luxury hotel (N = 676)	Prevalence of bowel dysfunction was 0.5%; for spastic irritable colon 4.4%; for painless diarrhoea 2.3%; for painless constipation 8.0%
Heaton et al. 1992[5]	Symptoms of IBS	Patient self-report	UK – consulters and non-consulters from a family physician's practice (N = 1896)	Prevalence for listed symptoms ranged from 2.5 to 24.8% for women and 1.9 to 15.8% for men. IBS defined as three or more symptoms, prevalence for women was 13% and 5% for men
Drossman et al. 1982[53]	Symptoms of IBS	Patients self-report	US – medical students and hospital employees not seeking care (N = 789)	Prevelence for alternating bowel function 28.5%; abdominal pain 11.7–24.2%; constipation 4.2–17.5%; diarrhoea 1.6–4.9%

Table 2. (*contd.*)

Study	Definition	Source	Population	Prevalence estimate
Everhart *et al.* 1989[6]	Symptoms of IBS	Patient self-report	US – data from 1971–75 National Health and Nutrition Examination Survey and follow-up 10 years later	In the first survey, prevalence of infrequent defecation was 3.1% for men and 9.1% for women; prevalence of frequent defecation was 15.7% for men and 8.4% for women
Kay *et al.* 1993[3]	Symptoms of IBS	Patient self-report	Denmark – random sample of 70-year-olds ($N = 803$)	Prevalence for two out of three symptoms (abdominal pain, altered stool consistency, borborygmi/distention) was 18% for men; 32% for women
Sandler *et al.* 1984[54]	Symptoms of IBS	Patient self-report	US – college students, new hospital employees, medical students ($N = 566$)	15% had bowel dysfunction compatible with IBS
Everhart & Renault 1991[16]	Diagnosis of IBS	Physician medical records	US – data from office-based practices reporting in the National Medical Care Surveys 1975; 1980–81; 1985	1.8 million visits in 1975; 4.7 million in 1980–81; and 2.5 million in 1985
Kang *et al.* 1994[55]	Diagnosis of IBS	Physician medical records	Hong Kong – consecutive new patients to out-patient clinics of two gastroenterologists ($N = 2384$)	17% of patients presenting
Longstreth & Wolde-Tsadik 1993[8]	Manning criteria	Patient self-report	US – one Health Maintenance Organization ($N = 1264$)	19.5% met criteria
Talley *et al.* 1991[9]	Manning criteria	Patient self-report	US – Olmstead County, Minnesota, ages 30–64 ($N = 1021$)	17.0% met criteria
O'Keefe *et al.* 1995[10]	Manning criteria	Patient self-report	US – Olmstead County, Minnesota, ages 65 and over ($N = 530$)	Prevalence of 11.5/100 for men and 21.1/100 for women
Jones & Lydeard 1992[11]	Manning criteria	Patient self-report	UK – randomly selected patients from lists of eight general practitioners ($N = 1620$)	22% met criteria
Schlemper *et al.* 1993[7]	Manning criteria with at least two symptoms, plus lower abdominal pain associated with diarrhoea, constipation, or both	Patient self-report	Holland – subjects from two multinational companies and the professional army ($N = 500$) Japan – employees with periodic medical examinations at two hospitals ($N = 231$)	9% of the Dutch; 25% of the Japanese met the criteria
Olubuyide *et al.* 1995[12]	Manning criteria	Patient self-report	Nigeria – medical students ($N = 336$)	43.5% met criteria
Drossman *et al.* 1993[13]	Rome criteria	Patient self-respect	US – responders to a householder survey ($N = 5430$)	11.6% met criteria; 9.4% with adjustments for age, sex and geograhic area
Talley *et al.* 1992[14]	Rome criteria	Patient self-report	US – Olmstead County, Minnesota age 30–64 ($N = 835$ for the initial survey and $N = 690$ for a remailing 12–20 months later)	Adjusting for age and sex, 7.2 per 100 for the initial survey; 8.0 per 100 for the second survey

By convention, the costs of any given disease are categorized under three principal headings. **Direct costs** comprise the expenditures incurred by the health-care system in managing the disease. Consultations with health-care professionals, preventative measures, diagnostic tests, medication, and in- and outpatient care are all examples of direct costs. In some studies, the latter also include personal spending by patients on the management of their disease. **Indirect costs** are the production losses that arise through absence from work due to ill health. At the extremes, such losses can stem from short-term absences of just a few days or permanent exit from the labour force because of severe disability or premature death. The third category of cost covers the pain, immobility and other physical and psychological deficits experienced by patients as a consequence of ill health. These **intangible** costs are difficult to translate into monetary terms and rarely feature as financial values in cost of illness studies. However, their significance to patients is increasingly being recognized, particularly in conditions such as IBS, and are captured through quality of life measurements; this will be addressed in the next section of this review.

The various economic elements of the burden of a given disease can be quantified in several ways. The most frequently adopted method is the prevalence approach, which typically examines a period of one year and, in the case of the direct (health service) costs of IBS, would seek to identify and value all of the resources employed in primary, secondary and tertiary care to diagnose and treat the syndrome. In those diseases where there exists an unambiguous definition of the condition and a unique identification number in the International Classification of Diseases (ICD), it is a straightforward process to draw on national and local data sources, as well as extrapolations from studies containing any relevant resource utilization information, to construct a profile of the direct cost burden. This is not the case in IBS. Although there is an ICD number (564.1) which refers to irritable colon, it is uncertain how accurately the volume of resource utilization coded under this heading reflects the true magnitudes involved because of the diagnostic ambiguities surrounding IBS. The problem is clearly illustrated in the context of GP consultation data.

Table 3a is based on information obtained from the fourth national study of morbidity in general practice in England and Wales[21] and shows sex- and age-specific

Table 3a. Estimated number of patients consulting for irritable bowel syndrome in the UK, 1995

Age group	Rates per 10 000 person years at risk		Number of patients consulting	
	Males	Females	Males	Females
0–4	1	1	197	187
5–15	8	17	3375	6802
16–24	35	187	12 697	64 536
25–44	54	206	46 537	173 030
45–64	54	180	35 419	120 078
65–74	61	130	14 213	36 361
75–84	34	86	3900	16 400
85+	12	49	316	3827
Total	40	142	116 654	421 221

rates for patients consulting a general practitioner for IBS at least once during the course of a year. Applying these rates to the latest population data for the UK indicates that nearly 540 000 people currently contact their family doctor each year because of the condition which, assuming a prevalence of 22%,[11] represents only 1 in 20 sufferers. This is consistent with the observation by Jones & Lydeard[11] that only a minority of patients with IBS seek medical advice.

The same survey also contains information which allows calculation of the annual number of consultations with family doctors for IBS. The relevant rates per 10 000 population are shown in Table 3b and, combined with UK population figures for 1995, indicate a current total of 846 349 consultations per annum. The latter is equivalent to an average of 1.6 contacts each year per patient seeking help from general practice for IBS. It also represents about 10% of the total primary care workload resulting from diseases of the digestive system and at an average cost per consultation of £15.49 in 1994/95,[22] results in an expenditure of £13.1 million per year.

Obviously this estimate should be treated with caution. The data from the fourth national study are now 5 years old and the 60 participating practices may not accurately represent the country as a whole. Furthermore, the cost per GP consultation is an average for all GP contacts rather than being specific for IBS. Lastly, and most significantly, there is no way of gauging how accurately IBS is being diagnosed and classified in the primary care setting and whether there is a tendency to over- or under-diagnose the condition.

Table 3b. Estimated number of consultations for irritable bowel syndrome in the UK, 1995

Age group	Rates per 10 000 person years at risk		Number of consultations	
	Males	Females	Males	Females
0–4	1	1	197	187
5–15	11	22	4640	8803
16–24	52	278	18 865	95 941
25–44	85	316	73 253	265 424
45–64	86	296	56 407	197 462
65–74	101	225	23 533	62 933
75–84	55	135	6309	25 745
85+	42	71	1105	5545
Total	64	223	184 309	662 040

The difficulties encountered in quantifying the amount and cost of general practitioner time consumed by IBS equally confound attempts to measure the expenditure on medicines prescribed by family doctors to treat the disorder. Data published by the Office of Health Economics show that in 1993 in the UK the net ingredient cost (drug cost alone, excluding dispensing fees) of prescriptions for all medicines acting on the gastrointestinal system amounted to £441 million.[20] This sum was equivalent to 12.3% of total spending and was second only to cardiovascular system preparations.

However, the annual expenditure on drugs employed specifically to treat IBS is extremely hard to calculate because some preparations are used to treat symptoms (e.g. diarrhoea) which can occur in other conditions as well as IBS. Conversely, some non-gastrointestinal medicines may also be used to try and help IBS sufferers.

In an attempt to overcome these problems, a market research study was undertaken for this review using the DIN-LINK database.[23] The latter is constructed from the computerized record-keeping of approximately 360 general practitioners working in 100 practices in the UK. Table 4 shows the medicines prescribed by these doctors against a diagnosis of IBS in 1995. The results, which are projected up from the sample to yield national (UK) data, indicate that nearly 1.7 million prescriptions were written for IBS in that year. If this figure is multiplied by the average net ingredient cost per prescription (1995) for gastrointestinal medicines (excluding ulcer-healing agents), which is estimated at £5.10, and a dispensing cost of almost £1 per prescription[20] is added, this yields a total expenditure on GP-prescribed medication for IBS of £10.1 million. This sum probably needs one further adjustment because the prescription numbers in the DIN-LINK database were generated by 437 000 patients whereas the fourth national study indicated a patient population of almost 537 900. Thus, the final figure is £12.5 million and although there is inevitably some uncertainty about its precision—questions may be raised, for example, about the accuracy of diagnostic entry in the DIN data set, the representativeness of the GP sample and the use of an average prescription cost covering all gastrointestinal medicines—it is probably one of the more accurate estimates currently available for UK spending on IBS medication in primary care.

The final component of the direct costs of IBS is expenditure on care provided in the secondary sector through outpatient consultations and inpatient stays and is just as difficult to assess because national sources of information do not provide sufficiently detailed data.

Table 4. IBS prescription data, UK 1995

	Prescriptions		
	000's	per patient	Average duration of treatment (days)
Plain antispasm/chol	651.2	2.5	70.7
Laxatives	489.8	3.3	103.7
Antidiarrhoeals	99.5	3.0	44.2
Analgesics	88.1	3.3	79.4
Antacids/Antiflat	64.1	3.4	44.6
Antidepressants	46.9	3.7	144.9
Antiulcerants	45.6	3.0	104.1
Antiemetics/nauseant	32.6	2.0	49.3
Others	158.7		
All products	1676.5	3.8	107.9

Table 5. Hospital resource use for IBS

	No. new GI patients seen per month	No. IBS or probable IBS	No. times seen before discharge	Percent admitted	Duration of admission (days)
Mean value per consultant	67	24	2.14	2.5*	5*
Range of values	28–180	5–45	1–4.5	0–10	2–14

* Median values.

It was therefore decided to conduct a survey for this review to gather the necessary information from consultant general gastroenterologists in the north of England. The results are shown in Table 5 and indicate that the average consultant gastroenterologist's clinic will see almost 300 new IBS or probable IBS patients in a year. Each of the patients will visit the clinic on slightly more than two occasions and a very small proportion, about 2.5%, will be admitted to a hospital bed for an average stay of 5 days.

On the assumption that there are 500 consultants in the UK[24] running general gastroenterology clinics, the survey findings suggest that there are approaching 310 000 outpatient attendances for IBS each year. In addition, 3600 sufferers are admitted as inpatients, thereby generating a total of 18 000 bed days. According to the Chartered Institute of Public Finance and Accountancy Health Database,[25] the costs per outpatient attendance and inpatient day in gastroenterology were £54 and £189, respectively, in 1994/95. It may therefore be estimated that IBS costs the hospital sector approximately £20 million per year, based on 1995 values.

Table 6 sums all of these data and shows that annual expenditure on IBS by the UK NHS is estimated to be £45.6 million, using 1995 data. This figure is equivalent to just 0.1% of total NHS annual spending and represents approximately £90 per consulting sufferer. IBS does not therefore appear to represent a major burden for the NHS. However, these results should be seen in the light of several considerations. First, the various cost estimates are constructed from imperfect databases and are, if anything, probably conservative. This is particularly likely to be the case with the GP consultation data. Second, average per capita costs will disguise potentially substantial differences at the extremes of the patient population. Furthermore, it is common for patients in the tertiary care setting to say that they do not bother to consult their doctor any more, despite continuing symptoms, because 'I know he cannot do anything more for me'. Finally, the absence

of appropriate information has meant that no account has been taken of the direct costs of IBS borne by patients, i.e. personal spending on over-the-counter medicines and other approaches to management of the disorder. In the latter context, a survey of 96 IBS patients in the UK found that 16% had consulted practitioners of alternative medicine about their condition.[26] Evidence has been reported of the effectiveness of hypnotherapy,[27] relaxation exercises[28] and psychological treatment,[29] among other approaches, in alleviating the symptoms of IBS. These techniques, which are not cheap to provide, are probably going to be used more in the future if no new medications are forthcoming.

An alternative to the prevalence approach to illness costing employed above is the incidence-based methodology which seeks to estimate the lifetime costs of managing a cohort of cases first diagnosed in a given year. Drummond[30] has argued that the latter is a particularly valuable technique because cost of illness estimates derived in this way provide a baseline against which new interventions can be economically assessed. The approach is, however, much more demanding in terms of data and the information systems required. A cohort-based approach to measuring the direct medical costs of IBS over a 1-year period has recently been employed by Talley and colleagues[31] in the USA. This investigation, which is the first of its kind, used a billing database linked to all local sources of medical care and analysed outpatient and inpatient health service

Table 6. The estimated cost of IBS to the UK National Health Service in 1995

	£ million
General practitioner consultations	13.1
GP-prescribed medication	12.5
Hospital outpatient attendances	16.6
Inpatient admissions	3.4
Total	45.6

charges, excluding outpatient medication, in relation to IBS status in a population of 3022 white people aged 20 years and older. This sample comprised 536 subjects (18%) who had symptoms indicating IBS, 1711 (57%) who had other gastrointestinal symptoms but did not meet the diagnostic criteria for IBS and 775 (25%) who did not have any gastrointestinal symptoms.

The study found overall median direct medical charges incurred by subjects with IBS of $742 for the study year, compared with $429 for controls and $614 for patients with some gastrointestinal symptoms. The IBS-related excess of $313 is equivalent to about £190 at current exchange rates and is therefore approximately twice the per capita cost derived for sufferers in the UK. (Interestingly, this two-fold difference is broadly similar to the pattern for overall health spending per capita.) It is, of course, difficult to compare the US and UK figures, given the contrasting nature of the two countries' health-care systems, the differences in the methodological approaches to cost estimation and the uncertainties about the representativeness of the sample of IBS patients in Talley's study. Nevertheless, it is probable that the gap can, in part at least, be attributed to higher costs and a tendency to undertake more extensive investigations and interventions in the US. Whatever the explanations, extrapolation of Talley's findings to the US white population suggests an annual excess charge due to IBS of $8 billion. This sum clearly represents a substantial level of resource use and further research would be helpful to determine how much of this excess annual expenditure is directly and indirectly IBS-related, as well as the balance between valuable and potentially unnecessary medical activity for this condition.[32]

QUALITY OF LIFE

Burden of illness can also be examined in terms of impact on quality of life. There is growing recognition among physicians and other health-care providers that patient well-being is a critical component of health, encompassing physical functioning, mental health, social interaction and overall quality of life. Although IBS is not life-threatening, patients report circumscribed lives that have been adapted in order to cope with their disease. These coping mechanisms have costs in terms of time lost from work, job opportunities, psychological consequences and limited social interaction with family and friends.

This decreased health status has been measured scientifically using quality of life questionnaires. Although several quality of life instruments have been developed previously without formal methodological or statistical processes, this is generally not the case today. Processes for developing scientifically valid and reliable questionnaires include selecting an initial pool of questions to test, reducing the number of questions, designing the questionnaire format, pre-testing the questionnaire, sampling a variety of populations, and testing the questionnaire for validity, reproducibility and responsiveness to change.[33]

Typically, health-related quality of life questionnaires are self-administered by the patient and contain a series of questions on various health domains. Questions pertaining to each domain are combined to form scales which represent one aspect of quality of life. The scales are scored and compared with those of either specific patient groups or established normative values to determine the patient's quality of life score relative to others or to chart progress with a particular therapy. Two types of questionnaires are available: disease-specific questionnaires to determine the effect of a given disease on the patient, and general questionnaires to capture overall quality of life that is not tied to a specific disease state.

Questionnaires have been used to describe symptoms of patients with IBS and to differentiate it from organic conditions such as inflammatory bowel disease[34, 35] but the bulk of quality of life research in IBS so far has examined individual aspects of a patient's life, rather than using a disease-specific questionnaire to develop a complete profile. For instance, Sjodin and Svedlund[36] found that in a group of IBS sufferers in Sweden, women were more likely to experience reduced sleep compared with controls. In a telephone survey of 832 adults in metropolitan Cincinnati,[37] subjects with IBS were more likely to miss work or to have changed their activities due to illness compared with controls. Other research has found that patients with IBS have decreased sexual functioning,[38] higher rates of psychological symptoms[39–41] and problems with employment, travel, leisure and diet.[42]

Some studies have examined general quality of life in patients with IBS. Using the Short-Form 36 (SF-36), a commonly used general quality of life questionnaire, O'Keefe *et al.*[10] found that in a population of elderly people, those with IBS and frequent abdominal pain had lower scores compared with either those with other

bowel disorders or a control group. Others have also used the SF-36 to examine quality of life in a group of college students and found that patients had poorer quality of life compared with non-patients or controls.[43]

One study has used an IBS-specific quality of life questionnaire and a general quality of life questionnaire (the SF-36) to examine the association between self-perceived severity and quality of life in patients attending a tertiary care facility.[44] The disease-specific questionnaire showed that patients with mild and moderate IBS were not significantly different but those with severe or very severe IBS rated their quality of life significantly lower for physical functioning, role physical, role emotional, social functioning, energy and mental health, compared with those with moderate IBS. As might be expected, the SF-36 results revealed that the poorest health for all dimensions was reported by patients with very severe IBS but the other groups also showed significant impairment of their quality of life.

In the same study, the SF-36 was also used to compare the impact of IBS on quality of life relative to other disease states. Figure 1 presents mean scores for persons with diabetes, acute myocardial infarction, hypertension or clinical depression compared with the IBS mean for the tertiary care group and national norms for non-patients. With the exception of the physical functioning index, people with IBS were comparable to people with depression in exhibiting the worst quality of life. Both groups reported significantly lower levels of emotional health, social functioning and mental health than the other groups.

In addition to patient well-being, impairment as measured by quality of life questionnaires is related to health-care resource utilization, which translates into economic costs. For example, the relationship between health-related quality of life and health-care seeking has been studied and has shown that people seeking health care for colonic symptoms have significantly lower quality of life scores on the SF-36 compared with people not seeking care.[10] In another study looking at the effect of hypnotherapy on quality of life in patients with IBS, an association between quality of life and resource use was also observed.[27] Control patients had particularly low scores in all domains and this was linked with more frequent time off work and increased consultations with their doctor. Thus, although the body of research in this area to date is not very large and is skewed towards selected groups of patients, there is a consistent theme of poor quality of life in IBS.
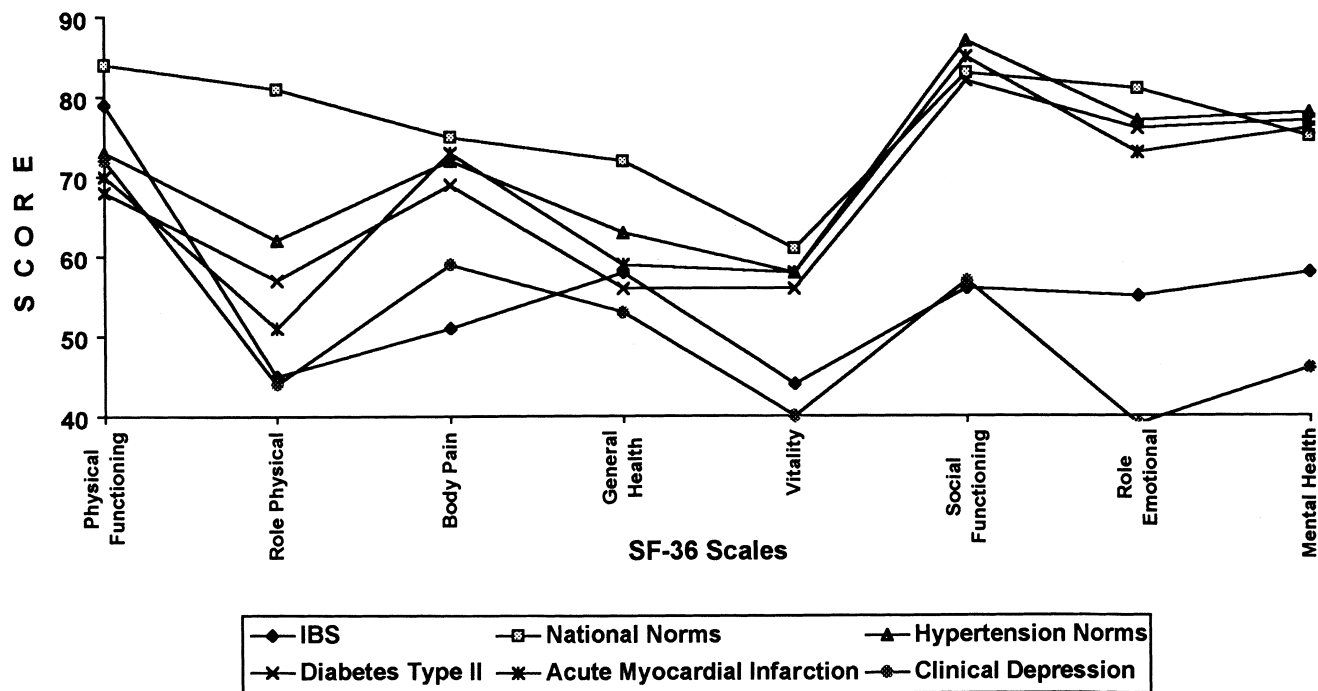

Figure 1. Mean SF-36 scores for subjects with IBS versus subjects without IBS or with some other medical condition.

DISCUSSION

It is clear that all three types of cost that can be imposed by a disease (direct, indirect and intangible—quality of life) are significantly influenced by IBS, but that their quantification is fraught with difficulties.

It is reasonably well-known that patients attending tertiary care centres are high utilizers of medical resources[45] and take much time off work,[27] but relatively few patients are ever referred to hospital and an even smaller proportion to tertiary care facilities. What happens to the rest, the majority, is only just beginning to be revealed,[13] but much more needs to be known.

Another problem is the uncertainty over setting the boundaries for any costing exercise—for instance, should the expense of non-gastrointestinal investigation and treatments undertaken before IBS is eventually diagnosed be included? This is a particularly important issue as it is well-known that the 'non-colonic' symptoms of IBS can lead to referral to gynaecological[46, 47] or urological[48] clinics, and there is a strong clinical suspicion that the same may be true for orthopaedic clinics, with respect to backache from which these patients often suffer.

Lack of data also confounds attempts to quantify the indirect or work productivity losses associated with IBS. 'Local' studies can be drawn upon to provide some very specific pieces of information. For example, in a small-scale evaluation of the benefits of hypnotherapy in refractory IBS,[27] it was found that patients undergoing this form of intervention experienced a mean loss of 2 work days per year compared to 17 work days among members of the control group. However, it would be inappropriate to apply cohort-specific findings such as these to either the general or consulting population of IBS sufferers in an attempt to gauge the overall productivity consequences of the disorder.

The current drugs for IBS are often regarded as being of questionable efficacy, but are extraordinarily cheap. There is therefore considerable potential for therapeutic advance and several pharmaceutical companies are directing research and development efforts at IBS. However, when new medicines do become available, it is likely that they will be more expensive than existing ones and this could lead to significant increases in the direct costs of IBS, especially if the drugs require long-term administration. Other therapeutic advances in the field of IBS are also likely to be far more expensive than

current options—this is already manifest in the case of hypnotherapy[27] and psychotherapy.[29]

Against this background, further research into the economics of IBS would be valuable. Such data would provide an indication of the magnitude of the burden in relation to other diseases and thereby supply useful information which could, for example, help determine research prioritization. A better understanding of the distribution of the costs of IBS within the health-care system would also permit a clearer identification of areas warranting closer attention in the attempt to achieve greater efficiency in health-care spending. It should, however, be emphasized that cost of illness data alone are inappropriate for determining whether further resources should be allocated to providing treatments for IBS. Decisions in this respect depend on the availability of treatment options, their cost and their effectiveness, not on the size of the economic burden generated by the disorder.[30]

ACKNOWLEDGEMENTS

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