Age-related symptom and life quality changes in women with irritable bowel syndrome

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Abstract

AIM: To explore age-related changes in symptoms and quality of life (QoL) of women with irritable bowel syndrome (IBS).

METHODS: Two-hundred and fifty-four female adult outpatients with IBS attending the Department of Gastroenterology at the First Affiliated Hospital of Nanjing Medical University between January, 2008 and October, 2008 were approached. Patients with a history of abdominal surgery, mental illness or those who had recently taken psychotropic drugs were excluded.

A physician obtained demographic and abdominal symptom data. All patients were asked to complete the Zung Self-Rated Anxiety and Depression Scale (SDS/SAS) and the IBS-specific QoL questionnaire. The patients were divided into six groups according to age, in 10-year increments: 18-27 years, 28-37 years, 38-47 years, 48-57 years, 58-67 years and 68-75 years (maximum 75 years). Age-related differences of abdominal pain or discomfort were analyzed using rank-sum tests. Differences in SDS/SAS and IBS-QoL scores between age groups were analyzed using one-way analysis of variance. Pearson’s correlations evaluated potential associations between IBS symptoms, psychological factors and QoL in each age group.

RESULTS: There were no differences in the distribution of IBS subtypes between age groups ($\chi^2 = 20.516, P = 0.153$). Differences in the severity of abdominal pain/discomfort with age were statistically significant ($\chi^2 = 25.638, P < 0.001$); patients aged 48-57 years, 58-67 years or 68-75 years had milder abdominal pain/discomfort than those in the younger age groups. The severity of anxiety or depressive symptoms did not differ between age groups (SDS, $\chi^2 = 390.845, P = 0.110$; SAS, $\chi^2 = 360.071, P = 0.220$). Differences of IBS-QoL scores were statistically significant between age groups ($\chi^2 = 1098.458, P = 0.011$). The scores of patients in the 48-57-year group were lower than those in the 18-27-year and 28-37-year groups (48-57-year group vs 18-27-year group, $74.88 \pm 8.76$ vs $79.76 \pm 8.63, P = 0.021$; 48-57-year group vs 28-37-year group, $74.88 \pm 8.76$ vs $79.04 \pm 8.32, P = 0.014$). The scores in the 68-75-year group were lower than those in the 18-27-year, 28-37-year and 38-47-year groups (68-75-year group vs 18-27-year group, $71.98 \pm 9.83$ vs $79.76 \pm 8.63, P = 0.003$; 68-75-year group vs 28-37-year group, $71.98 \pm 9.83$ vs $79.04 \pm 8.32, P = 0.002$; 68-75-year group vs 38-47-year group, $71.98 \pm 9.83$ vs $76.44 \pm 8.15, P = 0.039$). Anxiety and depression were negatively correlated with QoL in all age groups (SDS and QoL: 18-27-year group, $r = -0.562, P = 0.005$; 28-37-year group, $r = -0.540, P < 0.001$; 38-47-year group, $r = -0.775, P < 0.001$; 48-57-year group, $r = -0.445, P = 0.001$; 58-67-year group, $r = -0.691, P < 0.001$. Patients in the 58-67-year group had moderate anxiety and depression, moderate abdominal pain/discomfort, and moderate QoL.

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INTRODUCTION

Irritable bowel syndrome (IBS) is the most common functional gastrointestinal disorders. It is common in Chinese people, representing approximately 11% of outpatient cases in gastroenterology departments. Patients with IBS have long-term symptoms including abdominal pain or discomfort related to defecation, accompanied by emotional disorders such as anxiety or depression, and often have a poor quality of life (QoL). The abdominal symptoms of IBS may be related to changes of gastrointestinal motility, visceral sensitivity and other factors, and affected by estrogen and progesterone levels and psychological factors. Anxiety or depression in IBS patients may be associated with physical discomfort and mental stress, and related to the patient’s response to the disease and the degree of social support.

It is widely recognized that gastrointestinal motility, visceral sensitivity, and estrogen and progesterone levels differ between people of different ages, as do cognitive abilities and the response to disease. Do abdominal pain or discomfort, anxiety and depression vary with age in IBS patients? Are there are age-related differences in the impact of these symptoms on QoL? In this study, we explored these two questions.

IBS is more common in women than in men, and female IBS patients report more severe symptoms and generally have lower QoL. Therefore, we investigated age-related changes of symptoms and QoL in female patients with IBS in a Chinese population, with the aim of improving individual treatment.

MATERIALS AND METHODS

Subjects

First-time outpatients who attended the Department of Gastroenterology at the First Affiliated Hospital of Nanjing Medical University between January, 2008 and October, 2008 and met the Rome III criteria for IBS were recruited.

All patients were initially asked to undergo routine blood, urine and stool hemoccult tests, stool form examination, and endoscopy or radiographic examination of the gastrointestinal tract. Patients younger than 18 years, with a structural bowel disease or a history of abdominal surgery, diagnosed with mental illness by a psychiatrist or who had recently taken psychotropic drugs were excluded. Pregnant patients were not included.

Measurements

The age of each subject was recorded. A physician obtained demographic and abdominal symptom data. All patients were asked to complete the Zung Self-Rated Anxiety and Depression Scale (SAS/SDS) and the IBS-specific QoL (IBS-QoL) questionnaire.

IBS subtypes: Based on the Rome III diagnostic criteria and Bristol Stool Form Scale, the patients were divided into the following groups: IBS with constipation (IBS-C), IBS with diarrhea (IBS-D), mixed IBS (IBS-M) and unsubtyped IBS (IBS-U).

IBS abdominal symptoms: The patients were asked about the severity of their abdominal pain/discomfort, which was rated on a three-point response scale as follows: mild (“can be ignored if I don’t think about it”), moderate (“cannot be ignored, but does not affect my lifestyle”) or severe (“affects my lifestyle”).

SAS/SDS: Anxiety and depression were measured using the SAS and SDS assessment tools, respectively. Each of the SAS and SDS comprises 20 questions with four possible responses to each: never, rarely/sometimes, moderately (“cannot be ignored, but does not affect my lifestyle”) or severe (“affects my lifestyle”).

IBS-QoL: The IBS-QoL comprises 34 self-reported items; a higher total score indicates a better QoL.
food avoidance, social reaction, sexual issues and relationship problems.

Age groups: The patients were divided into six groups according to age, in 10-year increments: 18-27 years, 28-37 years, 38-47 years, 48-57 years, 58-67 years and 68-75 years (maximum 75 years).

Statistical analysis
All data were analyzed using SPSS Version 19.0. Statistical significance was set at $P < 0.05$. Categorical data and ratios were analyzed using the $\chi^2$ test. Rank-sum tests were used to analyze ranked data. All measurement data are reported as the mean ± SD. Differences in SDS/SAS and IBS-QoL scores between age groups were analyzed using one-way analysis of variance. Pearson’s correlations were used to evaluate the potential associations between IBS symptoms, psychological factors and QoL in each age group.

RESULTS

Patient background and clinical data
Two hundred and fifty-four women with IBS were approached for recruitment to this study. These patients were aged between 18 and 75 years ($46.67 ± 14.26$ years). The median duration of IBS was 3 years, and 8.4% of the patients had a history of IBS of more than 10 years. There were no differences in the duration of IBS between age groups (average duration of each group: $2.79 ± 2.48$ years, $2.22 ± 2.27$ years; $2.97 ± 3.32$ years, $2.97 ± 3.27$ years; $4.27 ± 4.79$ years, $4.35 ± 6.55$ years, respectively; $\chi^2 = 129.4, P = 0.101$). One hundred and twenty-three patients (48.4%) were diagnosed with IBS-D, 105 (41.3%) with IBS-C, 22 (8.7%) with IBS-M and 4 (1.6%) with IBS-U. There were no differences in the distribution of IBS subtypes between age groups ($\chi^2 = 20.516, P = 0.153$), as shown in Figure 1.

Symptoms by age
Abdominal pain/discomfort: Differences in the severity of abdominal pain/discomfort with age are shown in Figure 2. These differences were statistically significant ($\chi^2 = 25.638, P < 0.001$). There were no differences in SDS/SAS scores between any age groups (SDS, $\chi^2 = 390.845, P = 0.110$; SAS, $\chi^2 = 360.071, P = 0.220$).

Anxiety and depression: SAS and SDS scores with age are shown in Figure 3. There were no statistically significant differences between any age groups (SDS, $\chi^2 = 390.845, P = 0.110$; SAS, $\chi^2 = 360.071, P = 0.220$; Table 1), indicating that the severity of anxiety and depression does not vary with age.

Table 1  Severity of abdominal pain/discomfort and Zung Self-Rated Anxiety and Depression Scale scores in each age group

| Age group (yr) | Total (n) | Severity of abdominal pain/discomfort | Mean rank | SDS score | SAS score |
|---------------|----------|--------------------------------------|-----------|-----------|-----------|
|               |          | Mild  | Moderate | Severe |          |           |
| 18-27         | 23       | 12    | 5        | 6      | 150.74   | 52.17 ± 8.03 | 39.09 ± 8.18 |
| 28-37         | 46       | 29    | 10       | 7      | 133.84   | 51.83 ± 5.09 | 39.65 ± 6.16 |
| 38-47         | 68       | 34    | 22       | 12     | 149.66   | 54.03 ± 6.66 | 41.25 ± 7.37 |
| 48-57         | 52       | 45    | 9        | 1      | 106.90   | 54.24 ± 7.60 | 42.31 ± 7.37 |
| 58-67         | 42       | 33    | 8        | 1      | 110.82   | 54.60 ± 6.09 | 39.83 ± 6.82 |
| 68-75         | 20       | 17    | 3        | 0      | 102.53   | 56.15 ± 4.98 | 42.45 ± 7.81 |

The severity of abdominal pain/discomfort differed between age groups ($\chi^2 = 25.638, P < 0.001$). There were no differences in Zung Self-Rated Anxiety Scale (SAS) or Zung Self-Rated Depression Scale (SDS) scores between any age groups (SDS, $\chi^2 = 390.845, P = 0.110$; SAS, $\chi^2 = 360.071, P = 0.220$).

Figure 1  Distribution of irritable bowel syndrome subtypes in each age group. IBS: Irritable bowel syndrome; IBS-C: IBS with constipation; IBS-D: IBS with diarrhea; IBS-M: Mixed IBS; IBS-U: Unsubtyped IBS.

Figure 2  Severity of abdominal pain/discomfort by age. 1 = Mild; 2 = Moderate; 3 = Severe.
Association of abdominal pain, anxiety and depression with QoL

As shown in Figure 5, the severity of abdominal pain/discomfort was negatively correlated with IBS-QoL score in the 58-67-year and 68-75-year groups (P < 0.05), but there was no correlation in the 18-27-, 28-37-, 38-47- or 48-57-year groups. SAS and SDS scores were negatively correlated with IBS-QoL score in all age groups (P < 0.01).

DISCUSSION

In this study, most of the 254 women with IBS were middle-aged. IBS-D was the most common subtype, followed by IBS-C, IBS-M and IBS-U. The distribution of IBS subtypes showed no difference between any age groups, consistent with previous epidemiological studies.

Our study suggests that the severity of abdominal pain/discomfort differs in patients of different ages, but anxiety and depressive symptoms do not. Patients aged 48-57 years or 68-75 years had the worst QoL. Anxiety and depression were negatively correlated with QoL in all age groups, and a negative correlation between abdominal pain severity and QoL was found in patients aged more than 58 years, but not in younger patients.

Defecation-related abdominal pain/discomfort is the principal symptom of IBS. In the present study, patients older than 48 years had milder abdominal pain/discomfort. Visceral hypersensitivity, psychological factors, motility, immunity and infection are the major pathophysiologic factors in abdominal pain/discomfort in IBS, and the role of visceral hypersensitivity in the pathogenesis of IBS has become commonly accepted in recent years. IBS patients have been reported to have a decreased intestinal pain perception threshold and are more likely to report feeling pain.

Some studies have shown visceral sensitivity to decrease with age, and the role of visceral hypersensitivity in the pathogenesis of IBS has become commonly accepted in recent years. IBS patients have been reported to have a decreased intestinal pain perception threshold and are more likely to report feeling pain. Some studies have shown visceral sensitivity to decrease with age.

Sanoja et al. found that estrogen and progesterone can regulate sensitivity to pain and temperature sensation, and Heitkemper et al., summarizing the results of recent research, found that estrogen and progesterone can affect the symptoms of IBS. Most women over the age of 48 years are in the menopause or perimenopausal period, and the decline of estrogen and progesterone levels may be accompanied by decreased visceral sensitivity.

In the modern bio/psychosocial medical model, IBS is recognized as a psychosomatic disorder accompanied by various emotional disorders, among which anxiety and depression are the most common. The present study found no differences in SAS/SDS scores between age groups, suggesting that the severity of anxiety and depression is similar in patients of differing ages.

Although it has been confirmed that coping capacity increases with age, aging is accompanied by reduced sleep quality and blood hemoglobin concentration, and both of these are closely related to depression. Negative life events, social support and other factors are also involved in the occurrence of anxiety and depres-
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A1

IBS-QoL scores

Severity of abdominal pain/discomfort

$n = 23, r = 0.080, P = 0.716$

B1

IBS-QoL scores

Severity of abdominal pain/discomfort

$n = 46, r = -0.063, P = 0.679$

A2

IBS-QoL scores

SDS scores

$n = 23, r = -0.562, P = 0.005$

B2

IBS-QoL scores

SDS scores

$n = 46, r = -0.540, P < 0.001$

A3

IBS-QoL scores

SAS scores

$n = 23, r = -0.600, P = 0.002$

B3

IBS-QoL scores

SAS scores

$n = 46, r = -0.511, P < 0.001$

C1

IBS-QoL scores

Severity of abdominal pain/discomfort

$n = 68, r = 0.029, P = 0.812$

D1

IBS-QoL scores

Severity of abdominal pain/discomfort

$n = 55, r = 0.22, P = 0.876$
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C2

IBS-QoL scores vs. SDS scores

$n = 68, r = -0.775, P < 0.001$

D2

IBS-QoL scores vs. SDS scores

$n = 55, r = -0.558, P < 0.001$

C3

IBS-QoL scores vs. SAS scores

$n = 68, r = -0.675, P < 0.001$

D3

IBS-QoL scores vs. SAS scores

$n = 55, r = -0.558, P < 0.001$

E1

Severity of abdominal pain/discomfort

$n = 42, r = -0.366, P = 0.017$

F1

Severity of abdominal pain/discomfort

$n = 20, r = -0.448, P = 0.048$

E2

IBS-QoL scores vs. SDS scores

$n = 42, r = -0.692, P < 0.001$

F2

IBS-QoL scores vs. SDS scores

$n = 20, r = -0.732, P < 0.001$
Irritable bowel syndrome (IBS) is the most common functional gastrointestinal disorder. Most IBS patients have core symptoms of anxiety or depression, while gastrointestinal symptoms such as abdominal pain and changes in bowel habit represent somatization. In our previous study, we found that most IBS patients complained of nonspecific somatic symptoms such as dizziness, insomnia and fatigue. Although age-related changes in women with IBS may not improve QoL in these age groups, and antidepressant treatment may be more important. In IBS patients aged over 58 years, abdominal pain/discomfort was mild but closely associated with QoL. Thus, even slight abdominal pain should be controlled in the treatment of older patients. Although age-related physiological and psychological changes may be directly or indirectly related to ovarian function and female hormone levels, this was a retrospective study and thus we lack information on the patients’ hormone levels and menstrual history. Furthermore, the use of self-reported measures and individual differences in literacy and understanding may have affected the results. None of these limitations could be avoided.

In conclusion, the following points should be borne in mind when treating women with IBS. Firstly, in patients aged 48-57 years or over 68 years, factors other than IBS-related symptoms that affect QoL should be treated. Secondly, negative emotions should be treated in all patients; anti-anxiety and antidepressant treatment are especially important in young adults. Thirdly, to improve QoL, even mild abdominal pain should be controlled in elderly patients.
disorder. IBS is more common in women than in men, and female IBS patients report more severe symptoms and generally have a lower quality of life (QoL). Age-related changes, such as gastrointestinal motility, visceral sensitivity, estrogen and progesterone levels, cognitive abilities and the response to disease, may cause differences in abdominal pain or discomfort, anxiety and depression and reduced QoL levels. Therefore, the authors investigated age-related changes of symptoms and QoL levels in female patients with IBS in a Chinese population, with the aim of improving individual treatment profiles.

**Research frontiers**

The symptoms of IBS may be related to changes in gastrointestinal motility and visceral sensitivity and are affected by estrogen and progesterone levels, psychological factors, patient response to pain and the degree of social support. All of the above factors differ between people of different ages. In this study, authors demonstrate that differences in abdominal pain or discomfort levels, but not anxiety or depression, and their association with QoL exist in patients in different age groups.

**Innovations and breakthroughs**

Recent reports have highlighted the differences in IBS abdominal and psychological symptoms in different genders and IBS subtypes, which can guide individual treatment regimens. Other reports have referred to the different age distributions of IBS patients. However, no study has investigated age-related changes in symptoms and their association with QoL in IBS patients, particularly in an exclusively female patient cohort or in a Chinese population.

**Applications**

In this study, the authors have demonstrated the difference of IBS symptoms and their association with QoL in each patient age group. With this knowledge, the authors may improve individual treatment regimens for IBS according to the patient age.

**Terminology**

Zung self-rated anxiety and depression scale (SAS/SDS) are assessment tools that are used to measure anxiety and depression, respectively. Higher SAS/SDS scores indicate a greater degree of anxiety/depression. IBS-specific QoL questionnaire (IBS-QOL) is a QoL assessment tool, which was specifically set up for patients with IBS. A higher IBS-QOL score indicates a better QoL.

**Peer review**

The authors explored the age-related changes of symptoms, QoL and the correlations between these two parameters in a population of Chinese women. The results demonstrated that factors that affect QoL should always be treated together with symptoms. In young adults, and even mild abdominal pain should be controlled in elderly patients. These findings will help to improve the treatment of individuals with IBS.

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