Study on present situation and risk factors of anxiety and depression in ulcerative colitis patients

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Abstract:Background: patients with ulcerative colitis(UC)are prone to psychological disorders such as anxiety and depression. However, little is known about the pathophysiology and risk factors of this comorbid state. Objective: 1.to explore whether patients with ulcerative colitis in Chinese population are prone to anxiety and depression compared with the general population; 2.to explore the risk factors of anxiety and depression. Methods: in this study, patients with UC(n=65; observation group)and healthy volunteers(n=88; control group)were selected. The anxiety self-rating scale(SAS)and depression self-rating scale(SDS)of 65 patients with ulcerative colitis were used as the observation indexes, compared with 88 healthy control groups. At the same time, the relationship between social demography and clinical data of ulcerative colitis patients with anxiety and depression was analyzed. Results: self-score of anxiety(43.5±4.2), self score of depression(57.0±1.4)and incidence of anxiety and depression(67.7％)were significantly higher than those of the control group(36.33±9.54,40.34±11.89,18.18％) (P<0.05). The difference of patients' age, gender, marital status, living status, education background, occupation, income has no obvious correlation with the incidence of anxiety and depression(P>0.05). The difference of patients' personality traits, clinical types has significant correlation with the incidence of anxiety and depression(P<0.05). Introverted patients are prone to anxiety and depression(P<0.01), compared with extroverted patients. Chronic recurrent patients are prone to anxiety and depression(P<0.05), compared with chronic persistent patients and incipient patients. Conclusion: there is a high incidence of anxiety and depression in patients with ulcerative colitis, patients' personality traits and clinical types are risk factors. Therefore, regular psychological screening should be carried out and appropriate psychological consultation and intervention should be provided on the basis of routine treatment programmes.

Introduction Ulcerative colitis(UC), a type of inflammatory bowel disease(IBD), is a chronic nonspecific inflammatory disease whose etiology is not very clear. Inflammation invades large intestine mucosa and submucosa, with occasional deep layer. The annual incidence in western countries is 0.5-24.5/100000[1] in recent years, the incidence rate in China has also increased significantly[2-3], mostly in the 20-35 age group. This disease invades the rectum at first and continues to progress upward from the rectum, invading the proximal large intestine. Its clinical symptoms are mainly manifested as recurrent abdominal pain,

diarrhea, mucous purulent and bloody stool, with a long course of disease, which is difficult to cure. Recurrence and remission are alternating with each other, those who do not heal for a long time are prone to be cancerous. At present, there are still many controversies about the pathogenesis of UC, and the body's immune abnormality, intestinal infection and heredity have been recognized by scholars at home and abroad as the factors directly involved in the pathogenesis of UC. However, the mental and psychological factors have been reported for many times in the literature at home and abroad[4].

In recent years, domestic and foreign gastrointestinal and psychological scholars believe that, compared with chronic diseases such as endocrine system diseases and cardiovascular and cerebrovascular diseases, UC patients are more worried about the complications of their diseases and more prone to mental psychological abnormalities such as anxiety and depression[1]. The incidence of mental disorders is high in IBD patients. The incidence of anxiety and depression in IBD patients in remission was from 29％ to 35％. During the relapse of IBD patients, the incidence of anxiety was as high as 80％ and the incidence of depression was as high as 60％ [5-13].Studies have confirmed that there is a correlation of up to 74％ in the course of UC patients with mental and psychological disorders[14], mostly in anxiety and depression[15-16]. Foreign scholars conducted a survey on 1663 IBD patients' mental and psychological problems by questionnaire, and found that 11％ of IBD patients were in the state of depression and 43％ were in the state of anxiety, and the related risk factors of anxiety and depression were disease severity, activity period and economic conditions[17].

  Currently, there are few reports about the risk factors related to anxiety and depression in UC, especially the socioeconomic related factors. Self-rating anxiety scale(SAS)symptom scale[18], self-rating depression scale(SDS)symptom scale[19], social support rating scale(SSRS)[20], and related social factors were studied in patients with UC, aiming to research whether patients with UC are more likely to become anxious or depressive, compared with other chronic diseases or the general population. To explore the related risk factors of anxiety and depression in UC patients, and provide theoretical basis for psychological intervention and treatment of UC patients with mental disorders.

Subjects and methods

Subjects

Observation group: UC patients were enrolled continuously from July 2017 to September 2017 and were treated in the gastroenterology department of Shanghai Tenth People's Hospital of Tongji University, with a total of 65 cases. Inclusion criterion: Patients agree to participate in the investigation and sign the informed consent. Diagnostic criterion for UC: determined by international standards based on clinical, endoscopic, histopathological and radiological findings established previously[21]. Exclusion criterion:①clinical severe chronic disease;②disease terminal stage;③patients with a history of psychosis;④pregnant or lactating women. Control group: there were a total of 88 cases of healthy people. They have no major physical diseases, no history of mental diseases and no family aggregation of mental diseases. The patients agree to participate in the investigation and sign the informed consent.

2. **Research content** *social demographic characteristics and clinical data*
The social demographics and clinical data of patients were obtained through a review management questionnaire and electronic medical records. Participants self-reported the following social demographic variables: height, weight, body mass index(BMI), age, gender, marital status, personality traits, residential status, education background, occupation and monthly income. In addition, clinical data such as age of onset, course of disease, state of disease, clinical type and degree of disease of UC were recorded.

self-rating scale of anxiety and depression
All the participants completed questionnaires on the self-rated anxiety scale(SAS)and the self-rated depression scale(SDS)under the supervision of the inspectors. WK Zung SAS and SDS questionnaires were used to describe subjective feelings about symptoms of anxiety and depression of individual. All the scales contain 20 items and each item is divided 30 into 4 classes, which mainly evaluate the frequency of symptoms, and the standard is: "1" means never or little time, "2" means sometimes, "3" means most of the time, "4" means most or all of the time. There are 15 and 10 items of the 20 items stated by negative words, and they are graded in the order of 1~4 above. Items noted * are stated by positive words, in order of 4~1 reverse scoring. The main statistical index of the scale is the total score. Add up the scores of 20 items and you get a rough score. Multiply the rough by 1.25 and the round number is the standard score. Among them, the SAS standard score >38 is for anxiety, and the SDS standard score >50 is for depression. The two scales have high clinical usage rate and high reliability.

3. **Statistical analysis** SPSS 22.0 was used for statistical analysis. Anxiety and depression were the main dependent variables. Quantitative variables represent the mean plus or minus SD with values and ranges or with Gaussian distributions. Student t-tests and a single-item analysis of variance(as the case may be)were used to compare groups with demographic and disease-related data. P value was double tails, and Pstatistically significant.

Results

Patient characteristics
A total of 65 patients with UC were included in the observation group and 88 healthy volunteers were included in the control group. *Table* 1 shows the socio demographic characteristics of the study population. The differences in age, gender, marital status, residential status, education background, occupation, monthly income and other variables between the two groups have no significant correlation with the occurrence of anxiety and depression(P>0.05). There was a significant correlation between personality traits and the occurrence of anxiety and depression(P<0.01). Introverted patients are prone to anxiety and depression, compared with extroverted patients.

Anxiety and depression symptoms in the study population
Of the 65 UC patients in the observation group, 44 cases had different levels of anxiety and depression, with an incidence of 67.7％.14 patients got pure anxiety whose SAS score was 43.5±4.2 and incidence was 21.5％. Similarly, 2 patients got pure depression whose SDS score was 57.0±1.4 and incidence was 3.1％. The SAS score of 28 patients with combined

anxiety and depression was 48.8±7.8, SDS score was 58.0±5.6, and the incidence was 43.1%.

Of the 88 healthy volunteers in the control group, 45 cases had different levels of anxiety and depression, with an incidence of 51.1%. 22 patients got pure anxiety whose SAS score was 43.0±4.9 and incidence was 25.0%. Similarly, 3 patients got pure depression whose SDS score was 53.0±1.0 and incidence was 3.4%. The SAS score of 20 patients with combined anxiety and depression was 46.9±4.0, SDS score was 54.0±4.5, and the incidence was 22.7%.

The incidence and score of anxiety in the observation group were higher than those in the control group, and the difference was statistically significant($P<0.05$). Similarly, the incidence and score of depression in the observation group were higher than those in the control group, with statistically significant differences($P<0.05$). The sum of positive and negative event ratings is the life events scale(LES)rating. The comparison between LES and Social Support Rating Scales between the two groups is shown in *Table* 2. There was no statistically significant difference in the positive event score between the two groups. However, the difference between the two groups in negative event score and SSRS was statistically significant($P<0.01$).

Analysis of factors influencing anxiety and depression

Analyze social demographic characteristics and clinical data related to anxiety and depression(*Table* 3.1 to 3.16): height, weight, body mass index(BMI), age, gender, marital status, personality traits, residential status, education background, occupation, income, age of onset, course of disease, state of disease, clinical type and degree of disease of UC. Comparative analysis showed that personality traits(*Table* 3.7) and clinical type(*Table* 3.15)were risk factors for anxiety($P<0.01$, $P<0.05$).

Discussion

Gastrointestinal tract is the window of human emotional response. Gastrointestinal motility and secretion function are mainly regulated by the neuroendocrine system and susceptible to internal and external environment and emotional factors. Gastrointestinal diseases cause abnormal activity in the cerebral cortex of the body through the autonomic nervous system, resulting in abnormal emotion and mentality of the body. On the contrary, mental and psychological factors damage the immune system and the integrity of gastrointestinal mucosal barrier by affecting the nervous system. The connection between the gastrointestinal tract and the central nervous system is called the brain-gut axis. The mutual information communication between the two is called brain gut interaction, that is, the central nervous system receives internal and external information to transmit to the gastrointestinal tract, causing gastrointestinal movement, secretion and inflammation, while the gastrointestinal information is transmitted to the central nervous system, causing the body's cognitive behavior and emotional abnormalities[22]. Studies have shown that the amygdala, the core structure of the brain-gut axis, plays a fundamental role in regulating the body's mood when the body is hit by stress. At the same time, the blood oxygen level dependence signal of the amygdalas in UC patients was significantly decreased compared with that in normal people, indicating that UC is related to the body's emotions, and the dysfunction of amygdala affects the development and outcome of UC[23, 24]. The body

participates in the development of UC inflammation through HPAA, sympathetic-adrenal system, pro-inflammatory cytokines, substance P, and mast cells. When the body is under external pressure, mast cells transform the pressure signal into the body to release a large number of neurotransmitters and pro-inflammatory cytokines, causing intestinal pathological and physiological changes. Therefore, UC's disease activity is affected by stress and psychological disorder, the UC's inflammation can lead to mental and psychological abnormality of the body. However, there is still no unified conclusion on whether anxiety and depression occur before or after UC.

In this study, the incidence and score of anxiety and depression in the observation group were higher than those in the control group, and the difference was statistically significant(P<0.05). In addition, a variety of socio-demographic factors and disease related factors were assessed in relation to anxiety and depression. The results showed that personality traits and clinical types were risk factors for anxiety and depression. This is the first study to report two new risk factors for anxiety and depression(personality traits and clinical types)in UC patients. The problems in this study:①subjects of this study were recruited from a university/hospital clinic, which may lead to selection bias.②the sample size is small and only a small number of UC patients were recruited. There may be limitations when screening risk factors. ③the study did not assess the association between disease activity and anxiety and depression levels. Previous studies have reported that anxiety and depression occur more frequently during fever or more severe episodes.

Conclusion

Firstly, Chinese patients with UC are more prone to anxiety and depression, compared with the general population. Secondly, the new risk factors were personality traits and clinical types. Finally, in the clinical treatment of UC, attention should be paid to the related risk factors of anxiety and depression. Once the relevant risk factors are identified, psychological evaluation should be given as soon as possible to avoid delaying the treatment effect.32

Table 1.Socio demographic characteristics of study population

	Items	Observational group	Control group
Age	Under 18 years old	9	8
	19-28 years old	20	31
	29-44 years old	24	30
	45-59 years old	11	17
	60-74 years old	1	2
Gender	Male	39	39
	Female	26	49
Marital status	Unmarried	25	44
	married	38	33
	divorced	1	7
	Widowed	1	4
Personality trait	Introverted	43	34
	Extroverted	22	54
Residential status	Rural resident	35	37
	Urban resident	30	51
Educational background	Below primary school	2	0
	Junior middle school	16	8
	Senior middle school and technical secondary school	18	34
	College and undergraduate	24	44
	Master degree or above	5	2
Occupation type	Manual work	5	9
	Mental work	35	44
	Mixed work	25	35
Monthly income	Less than 1500 yuan	30	6
	1500-3000 yuan	12	5
	3000-6000 yuan	12	30
	6000-9000 yuan	6	24
	More than 9000 yuan	5	23

Table 2.Comparison of SAS, SDS, LES (+), LES (-), and SPSS between 2 group

Items	Observational group (n=65)	Control group (n=88)	P value
Anxiety rating (SAS)	40.3±11.2	36.3±9.5	0.0216
Depression rating (SDS)	45.8±13.6	40.3±11.9	0.0113
Positive event rating	3.8±8.6	3.1±7.9	0.5740
Negative event rating	14.1±38.4	-5.4±9.0	0.0002
Social support rating	27.8±5.8	25.3±6.2	0.0098

SAS=Self-Rating Anxiety Scale; SDS=Self-Rating Depression Scale; LES=Life Event Scale; SSRS=Social Support Rating Scale

Table 3.1 Correlation between height and anxiety and depression Height (cm)

Height (cm)	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
141-150	2	1	0	1
151-160	16	9	7	16
161-170	27	16	11	27
171-180	20	16	12	28

Table 3.2 Correlation between weight and anxiety and depression Weight (kg)

Weight (kg)	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
21-30	2	1	0	1
31-40	10	7	5	12
41-50	20	12	8	20
51-60	19	12	11	23
61-70	11	9	5	14
71-80	3	1	1	2

Table 3.3 Correlation between BMI and anxiety and depression

BMI	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
<18.5	35	24	19	43
18.5-24.9	26	14	9	23
>24.9	4	4	2	6

BMI=body mass index

Table 3.4 Correlation between age and anxiety and depression

Age	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Under 18 years old	9	5	3	8
19-28 years old	20	12	10	22
29-44 years old	24	18	12	30
45-59 years old	11	6	4	10
60-74 years old	1	1	1	2

Table 3.5 Correlation between gender and anxiety and depression

Gender	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Male	39	27	19	46
Female	26	15	11	26

Table 3.6 Correlation between marital status and anxiety and depression

Marital status	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Unmarried	25	15	12	30
Married	38	26	18	44
Divorced	1	1	0	4
Widowed	1	0	0	4

Table 3.7 Correlation between personality trait and anxiety and depression

Personality trait	Observational group (n=65)	Anxiety (n%)*	Depression (n%)	Total
Introverted	43	30	24	54
Extroverted	22	12	6	18

Table 3.8 Correlation between residential status and anxiety and depression

Residential status	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Rural resident	35	23	19	42
Urban resident	30	19	11	30

Table 3.9 Correlation between educational background and anxiety and

Educational background	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Below primary school	2	1	1	2
Junior middle school	16	6	6	12
Senior middle school and technical secondary school	18	14	9	23
College and undergraduate	24	16	11	27
Master degree or above	5	5	3	8

Table 3.10 Correlation between occupation and anxiety and depression

Occupation	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Manual work	5	1	0	1
Mental work	35	27	17	44
Mixed work	25	14	13	27

Table 3.11 Correlation between monthly income and anxiety and depression

Monthly income	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Less than 1500 yuan	30	17	11	28
1500-3000 yuan	12	5	6	11
3000-6000 yuan	12	11	7	18
6000-9000 yuan	6	5	3	8
More than 9000 yuan	5	4	3	7

Table 3.12 Correlation between onset age and anxiety and depression

Onset age	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Under 18 years old	15	10	6	16
19-28 years old	26	18	14	32
29-44 years old	14	9	6	15
45-59 years old	9	5	4	9
60-74 years old	1	0	0	0

Table 3.13 Correlation between course of disease and anxiety and depression

Course of disease	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
Less than 6 months	11	9	7	15
6 months-1 year	8	3	2	5
1 year -2 years	14	6	6	12
2- 5 years	18	12	7	19
5 - 10 years	10	8	5	13
More than 10 years	4	4	3	7

Table 3.14 Correlation between disease state and severity with anxiety and

depression

Disease state and severity	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
In remission	26	12	8	20
Mild	14	8	6	14
Moderate	23	20	15	35
Severe	2	2	1	3

Table 3.15 Correlation between clinical types and anxiety and depression

Clinical type	Observational group (n=65)	Anxiety (n%)*	Depression (n%)	Total
Chronic persistent	30	16	12	28
Chronic recurrent	20	15	10	25
New-onset	2	1	0	1

Table 3.16 Correlation between extent of disease and anxiety and depression

Extent of disease	Observational group (n=65)	Anxiety (n%)	Depression (n%)	Total
E1	21	13	8	21
E2	14	10	6	16
E3	29	18	16	34

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