

A Cross-Sectional Study on the Relationship Between Rosacea Severity and Quality of Life or Psychological State

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Background: Rosacea appears predominantly in highly visible areas of the facial region.

Objective: To investigate the psychological status and quality of life(QOL) of rosacea.

Methods: We used a hospital-based cross-sectional analytical study design between Jan 1, 2020, and Jan 1, 2021. We analyzed the differences and correlations in the severity of rosacea and its impacts on QOL and mental health, separately.

Results: 469 patients with rosacea were included. The mean Dermatology Life Quality Index (DLQI) score was 12.6 ± 7.7 and the affected level of DLQI was moderately severe. The total score of Rosacea-specific Quality-of-Life instrument (RosQol) was 2.34 ± 0.84 , and the scores of emotion, symptoms, and function were 2.41 ± 0.99 , 2.37 ± 0.82 , and 2.03 ± 0.89 , respectively. 44.8% of patients suffered from anxiety and 37.5% from depression. There were statistically significant differences in the incidence of anxiety ($p < 0.001$), the DLQI ($p = 0.02$), RosQol emotion ($p = 0.04$), symptom ($p < 0.01$) and function ($p = 0.02$) scores in the different severity. In addition, worsening QOL was significantly associated with increased disease severity [Spearman's rank correlation index (r) ranging from 0.171 to 0.266, $p < 0.01$ (RosQol); $r = 0.104$, $p = 0.024$ (DLQI)]. There was also a positive correlation between anxiety [$r = 0.155$; $p < 0.01$] and the different severity levels.

Conclusion: Rosacea maybe has a greater significant impact on patient's QOL and mental health. And the impact of QOL and mental health tend to deteriorate significantly with increasing disease severity. The relationship suggests that QOL assessment is of great interest in clinical practice and should be further explored.

Keywords: rosacea, severity, quality of life, depression, anxiety

Introduction

Rosacea is a chronic recurrent inflammatory disease affecting facial skin, commonly in women aged 30–55.^{1–3} The estimated prevalence of rosacea ranges from 0.1% to 22%,^{4–7} while the prevalence was reported as 3.48% in China.⁸ The pathogenesis of rosacea is complex, involving multiple links such as genetics, microbial dysbiosis, neurovascular dysfunction, and immune system disorders.^{9–12} Rosacea is characterized by persistent erythema, telangiectasia, papules and pustules, and even rhinophyma. Patients may experience discomfort such as burning, stinging, and tingling sensation. It is clinically characterized by relapses or exacerbations in response to stimuli such as elevated temperature and emotional stress.^{1,2,13,14} In recent years, studies have shown that rosacea is associated with several systemic diseases.¹⁵

Facial features are critical in influencing others' perceptions of attractiveness and can affect a range of prominent social outcomes, from mate choice and hiring decisions to decisions about social exchange.^{16–18} Since rosacea appears predominantly in highly visible areas of the facial region, it can affect the patient's cosmetic appearance and affect patient's social and occupational interactions. This in turn has a negative impact on the patient's quality of life (QOL) and mental health.¹⁹ Therefore, patients with rosacea suffer from a tremendous psychological burden that should not be underestimated. Nowadays, the impact of rosacea on QOL and mental health is a growing concern for dermatologists.

A variety of studies have shown an increased risk of anxiety and depression and impaired QOL in patients with rosacea.^{20–24} The clinical features are heterogeneous, so the burden of the disease it causes may vary. However, the complex relationship between rosacea severity and QOL and mental health has not been examined in depth.

Methods

Study Design

The study was designed as a cross-sectional, observational study and conducted in the diagnostic room of a tertiary hospital between Jan 1, 2020, and Jan 1, 2021. We collected information by dermatologists asking patient's information and by patients writing standardized questionnaires.

This study was approved by the Medical Ethics Committee of the West China Hospital of Sichuan University (Clinical Trials.gov ID:2019–248). The work described has been carried out under The Code of Ethics of the World Medical Association (Declaration of Helsinki). All enrolled patients signed the informed consent form.

Inclusion criteria were: (1) diagnosed with rosacea according to the 2019 National Rosacea Society Expert Committee (NRSEC) criteria;¹⁴ (2) capable of understanding the content of the questionnaire; (3) read and signed the informed consent.

Exclusion criteria were: (1) Patients with other concurrent facial skin diseases such as acne, seborrheic dermatitis, psoriasis, eczema, and systemic lupus erythematosus; (2) Patients with neuropsychiatric diseases such as migraine, schizophrenia, anxiety disorder, depressive disorder.

Data Collection

Clinical Features of Rosacea and Assessment of Its Severity

Our study analyzed clinical features based on rosacea phenotypes including flushing, persistent erythema, papules and pustules, telangiectasia, phymatous changes, edema, dry sensation, burning sensation as well as stinging sensation. Moreover, our study collected disease duration, and comorbidities of rosacea.

The severity was measured using Investigator's Global Assessment (IGA) and Clinician's Erythema Assessment (CEA).^{25,26} And the CEA assessment referred to the VISIA[®] system which is the most commonly used to quantify the severity of erythema in studies.²⁷

QOL and Psychological State

Dermatology Life Quality Index (DLQI) was the first dermatology-specific QOL and was the most widely used.^{28,29} The DLQI comprised of ten items, each with four answers. Each item was scored on a four-point scale: not at all (0); a little (1); a lot (2); very much (3). The DLQI total score was calculated by summing the score of each question, a higher score correlates with a more impaired QoL. The clinical interpretation of the DLQI scores is as follows: Grade 1 (0–1), no impact on the patient's life at all; grade 2 (2–5), low impact on the patient's life; grade 3 (6–10), moderate impact on the patient's life; grade 4 (11–20), very large impact on the patient's life; grade 5 (21–30), extremely large impact on the patient's life.

Rosacea-specific Quality-of-Life instrument (RosQoL) was a validated tool designed specifically for rosacea patients to assess the QOL, which consisted of 21 rosacea-specific items, grouped into three domains: symptoms, function, and emotion. Each item ranges from 1 (never) to 5 (always), with higher scores indicating greater QOL impairment.³⁰

We assessed the psychological state using the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). HADS has been widely applied in screening for anxiety and depression in patients quickly and has shown to demonstrate good to excellent psychometric properties.^{31–33} HADS was divided into the Anxiety subscale (HADS-A) and the Depression subscale (HADS-D), both containing seven intermingled items (scored from 0 to 3). 0 ~ 7 points represent normal, 8 ~ 10 points represent mild anxiety, and depression, 11 ~ 14 points represent moderate anxiety and depression, and 15 ~ 21 points represent severe anxiety and depression.

Quality Control

Diagnosis of all patients with rosacea was determined by the same senior dermatologist according to the standard of diagnosis, which makes selection bias less likely in this study. The patients were assigned severity scores (IGA and CEA) by specialized dermatologists, and all scores were done by the same doctor. All data were collected by trained study

personnel under standard protocols in Dermatology diagnostic room. When collecting data, investigators had a unified, professional and detailed explanation for the questionnaire, so that patients would not misunderstand the content. Each questionnaire was completed in approximately 15–20 minutes. After each questionnaire was completed, data were recorded by two investigators and the original data were checked at the time of data entry.

Statistical Analysis

All statistical analyses were performed using SPSS statistical software (version 28, IBM). Quantitative variables are expressed as the mean \pm standard deviation (SD). Categorical data are reported as frequency and percentage.

Patients were divided into different groups according to the severity. The single-factor analysis assessed quantitative variables in different groups and the homogeneity of variance test was evaluated before the single-factor analysis. The Kruskal–Wallis test was used to compare non-normal distribution data. Comparisons between more than three groups of ordered rank data were performed using the Spearman test. The correlation between patients in different severity groups and their QOL and mental state level was assessed using Spearman's rank correlation. A two-sided p -value < 0.05 was considered statistically significant.

Results

Clinical Features of Rosacea and Assessment of Its Severity

A total of 469 patients with rosacea were included, with an average age of 36.6 ± 10.6 years. The sex ratio was 5.2 (392 female and 77 male). The main clinical features included are summarized in Table 1. The scores of CEA were predominantly mild (46.9%), moderate (29.9%), and severe (6.4%). IGA scores were mild in 33.9%, moderate in 31.6%, and severe and very severe in 20%. Overall, the severity in our study was mainly mild to moderate.

QOL and Psychological Impact

The results of HAD showed that 44.8% of patients suffered from anxiety and 37.5% from depression, with both anxiety and depression being predominantly mild to moderate (Table 2).

Table 1 Clinical Characteristics of Rosacea

Items		Number of Cases	Percentage (%)
Gender	Men	77	16.4
	Female	392	83.6
Age (years)	<20	15	3.2
	20–30	117	24.9
	30–40	166	35.4
	40–50	121	25.8
	≥ 50	50	10.7
	Disease duration (years)	<5	343
	5–10	85	18.1
	≥ 10	41	8.7
Rosacea Phenotype	Flushing/transient erythema	294	62.7
	Nontransient erythema	441	94.0
	Papules and pustules	302	64.4
	Telangiectasia	431	91.9
	Phymatous changes	82	17.5
	Burning/Stinging sensation of the skin	389	82.9
	Dry sensation of the skin	376	80.2
	Edema	149	31.8

(Continued)

Table 1 (Continued).

Items			Number of Cases	Percentage (%)
Severity rating	IGA	Almost clear	68	14.5
		Mild	159	33.9
		Moderate	148	31.6
		Severe	77	16.4
		Very severe	17	3.6
	CEA	Clear	23	4.9
		Almost clear	56	11.9
		Mild	220	46.9
		Moderate	140	29.9
		Severe	30	6.4
Combined systemic diseases			44	9.4

Note: Categorical variables are described by numbers (%).

The majority of patients (94.9%) had an unfavorable impact on their QOL. The mean DLQI score was 12.6±7.7 and the impact of rosacea on QOL was mainly moderate to severe (Table 3).

In terms of RosQol, the total score of RosQol was 2.34 ± 0.84, and the total scores of emotion, symptoms, and function were 2.41 ± 0.99, 2.37 ±0.82, and 2.03 ± 0.89, respectively (Table 4).

Table 2 Psychological State (Anxiety and Depression) in Patients with Rosacea

Items			Number of Cases	Percentage (%)
HADS	Anxiety	None	259	55.2
		Mild	104	22.2
		Moderate	67	14.3
		Severe	39	8.3
	Depression	None	293	62.5
		Mild	103	22.0
		Moderate	50	10.7
		Severe	23	4.9

Note: Categorical variables are described by numbers (%).

Table 3 DLQI Assessment Results in Patients with Rosacea

Items		Number of Cases	Percentage (%)
DLQI	Clear	24	5.1
	Mild	66	14.1
	Moderate	132	28.1
	Severe	166	35.4
	Very severe	81	17.3

Note: Categorical variables are described by numbers (%).

Table 4 RosQol Assessment Results in Patients with Rosacea

Items	Average SCORE	
RosQol total	2.34	±0.84
RosQol emotion	2.41	±0.99
RosQol symptoms	2.37	±0.82
RosQol function	2.03	±0.89

Note: Quantitative variables are described as means ± standard deviation (SD).

Differential Analysis of QOL and Psychological Impact of Rosacea Patients with Different Severity Levels

As can be seen from Table 5, there were statistically significant differences in RosQol emotion ($p = 0.04$), symptoms ($p < 0.01$) and function ($p = 0.02$) at different severity levels (IGA), as well as differences in DLQI ($p = 0.02$). While from the CEA grouping (Table 6), there was no significant variability between the groups.

The incidence of anxiety was different with different severity, and the difference was statistically significant ($p < 0.001$). Furthermore, patients with moderate to severe rosacea had a greater proportion of negatively affected QOL, a higher probability of anxiety and depression, and more severe anxiety and depression.

Table 5 Variability in QOL and Psychological State (Anxiety and Depression) Between Different Severity Levels (IGA)

IGA			Almost Clear (n=68)		Mild (n=159)		Moderate (n=148)		Severe (n=77)		Very Severe (n=17)		Total (n=469)		p
RosQol		RosQol total	2.06	±0.81	2.23	±0.80	2.42	±0.83	2.59	±0.80	2.8	±1.06	2.34	±0.84	<0.01
		RosQol emotion	2.22	±0.93	2.29	±0.93	2.44	±1.03	2.71	±0.97	2.73	±1.14	2.41	±0.99	0.04
		RosQol symptoms	1.97	±0.79	2.23	±0.79	2.51	±0.78	2.57	±0.76	3.02	±1.08	2.37	±0.82	<0.01
		RosQol function	1.7	±0.96	1.97	±0.85	2.11	±0.84	2.21	±0.85	2.55	±1.03	2.03	±0.89	0.02
HADS	Anxiety	None	39	(57.4)	101	(63.5)	82	(55.4)	30	(39)	7	(41.2)	259	(55.2)	<0.001
		Mild	18	(26.5)	34	(21.4)	22	(14.9)	23	(29.9)	7	(41.2)	104	(22.2)	
		Moderate	8	(11.8)	14	(8.8)	8	(19.6)	15	(19.5)	1	(5.9)	67	(14.3)	
		Severe	3	(4.4)	10	(6.3)	15	(10.1)	9	(11.7)	2	(11.8)	39	(8.3)	
DLQI	Depression	None	43	(63.2)	104	(65.4)	93	(62.8)	45	(58.4)	8	(47.1)	293	(62.5)	0.106
		Mild	17	(25)	36	(22.6)	30	(20.3)	14	(18.2)	6	(35.3)	103	(22)	
		Moderate	7	(10.3)	13	(8.2)	16	(10.8)	11	(14.3)	3	(17.6)	50	(10.7)	
		Severe	1	(1.5)	6	(3.8)	9	(6.1)	7	(9.1)	0	(0)	23	(4.9)	
DLQI		Clear	6	(8.8)	6	(3.8)	9	(6.1)	3	(3.9)	0	(0)	24	(5.1)	0.022
		Mild	7	(10.3)	26	(16.4)	23	(15.5)	8	(10.4)	2	(11.8)	66	(14.1)	
		Moderate	23	(33.8)	48	(30.2)	36	(24.3)	23	(29.9)	2	(11.8)	132	(28.1)	
		Severe	25	(36.8)	55	(34.6)	52	(35.1)	27	(35.1)	7	(41.2)	166	(35.4)	
		Very severe	7	(10.3)	24	(15.1)	28	(18.9)	16	(20.8)	6	(35.3)	81	(17.3)	

Notes: Categorical variables are described by numbers (%) and quantitative variables are described as means ± standard deviation (SD). Statistically significant p values are in bold.

Table 6 Variability in QOL and Psychological State (Anxiety and Depression) Between Different Severity Levels (CEA)

CEA			Clear (n=23)		Almost Clear (n=56)		Mild (n=220)		Moderate (n=140)		Severe (n=30)		Total (n=469)		p	
RosQol	RosQol toal		2.24	±0.91	2.22	±0.8	2.29	±0.83	2.44	±0.8	2.58	±1.06	2.34	±0.84	0.138	
	RosQol emotion		2.39	±1.05	2.32	±0.92	2.36	±0.96	2.49	±1.01	2.58	±1.17	2.41	±0.99	0.569	
	RosQol symptoms		2.19	±0.84	2.2	±0.8	2.3	±0.83	2.5	±0.74	2.7	±1.03	2.37	±0.82	0.009	
	RosQol function		1.86	±0.89	1.92	±0.9	1.98	±0.91	2.14	±0.77	2.3	±1.16	2.03	±0.89	0.241	
HADS	Anxiety	None	11	(47.8)	31	(55.4)	132	(60)	74	(52.9)	11	(36.7)	259	(55.2)	0.116	
		Mild	8	(34.8)	11	(19.6)	45	(20.5)	30	(21.4)	10	(33.3)	104	(22.2)		
		Moderate	4	(17.4)	11	(19.6)	26	(11.8)	21	(15)	5	(16.7)	67	(14.3)		
	Depression	Severe	0	(0)	3	(5.4)	17	(7.7)	15	(10.7)	4	(13.3)	39	(8.3)		
		None	14	(60.9)	31	(55.4)	145	(65.9)	87	(62.1)	16	(53.3)	293	(62.5)		0.572
		Mild	6	(26.1)	16	(28.6)	47	(21.4)	28	(20)	6	(20)	103	(22)		
		Moderate	3	(13)	5	(8.9)	22	(10)	15	(10.7)	5	(16.7)	50	(10.7)		
Severe	0	(0)	4	(7.1)	6	(2.7)	10	(7.1)	3	(10)	23	(4.9)				
DLQI	Clear	2	(8.7)	5	(8.9)	10	(4.5)	6	(4.3)	1	(3.3)	24	(5.1)	0.271		
	Mild	3	(13)	3	(5.4)	37	(16.8)	19	(13.6)	4	(13.3)	66	(14.1)			
	Moderate	4	(17.4)	22	(39.3)	58	(26.4)	41	(29.3)	7	(23.3)	132	(28.1)			
	Severe	9	(39.1)	18	(32.1)	84	(38.2)	47	(33.6)	8	(26.7)	166	(35.4)			
	Very severe	5	(21.7)	8	(14.3)	31	(14.1)	27	(19.3)	10	(33.3)	81	(17.3)			

Notes: Categorical variables are described by numbers (%) and quantitative variables are described as means ± standard deviation (SD). Statistically significant p values are in bold.

Correlation Analysis of the Severity of Rosacea with QOL and Psychological Impact

It is summarized from Table 7 that the correlations between the severity of IGA and DLQI ($p = 0.024$), RosQol emotion ($p < 0.01$), symptoms ($p < 0.01$), function ($p < 0.01$), and anxiety ($p < 0.01$) were all statistically significant. And all the correlations were highly significant and positive.

From the perspective of CEA, the correlation coefficients were all positive, and the correlations with RosQol’s symptoms ($p < 0.01$) and functions ($p = 0.025$) were also statistically significant.

Table 7 Correlation Between the Severity of Rosacea and Its QOL and Psychological Status (Anxiety and Depression)

	IGA		CEA	
	Correlation Index <i>r</i>	<i>p</i>	Correlation Index <i>r</i>	<i>p</i>
DLQI	0.104	0.024	0.052	0.257
Anxiety	0.155	<0.01	0.073	0.116
Depression	0.076	0.102	0.028	0.549
RosQol toal	0.218	<0.01	0.111	0.016
RosQol emotion	0.171	<0.01	0.078	0.092
RosQol symptoms	0.266	<0.01	0.151	<0.01
RosQol function	0.175	<0.01	0.104	0.025

Note: Statistically significant p values are in bold.

Discussion

QOL is a term implemented by the World Health Organization that represents an index of people's ability to lead a productive and enjoyable life.³⁴ However, the impact of skin diseases on patients' QOL and even psychological well-being has always been a concern for dermatologists. Psoriasis, atopic dermatitis, hidradenitis suppurativa, ichthyosis, acne-related scars, and other skin conditions all have varying degrees of negative impact on QOL.^{35–39} A study summed up the important role of assessing QOL for diseases in the field of dermatology in the following five categories: inform clinical decisions, clinician-patient communication, awareness of skin disease burden, informing the consultation, and clinical service administration.⁴⁰ As a result, QOL measures are now routinely incorporated into dermatological studies. DLQI is the most extensively used skin-specific QOL measure in over 40 dermatologic conditions and is also recommended by the ROSacea COnsensus for assessing the burden of patients with rosacea.⁴¹ RosQol is a quality-of-life measurement tool specifically for rosacea.²⁵ In our study, the use of these two tools to assess QOL in rosacea can complement each other and make the results convincing.

Our results showed that the impact of rosacea on QOL was mainly moderate to severe and the average score of DLQI was 12.6 ± 7.7 , which is within the range reported in systematic reviews (4.1–17.3).⁴² In our study, all patients were recruited from tertiary hospitals rather than the community and may have had more severe rosacea or more severe impairment of QOL, which may have contributed to selection bias leading to a relatively high DLQI score. In terms of RosQol, the total score of RosQol was 2.3 and the scores of the three aspects of emotion, symptoms, and function were 2.4, 2.4, 2.0, respectively. There are still relatively few studies on RosQol to assess QOL in rosacea patients, and our results show that rosacea has an adverse impact in three areas: emotion, symptoms, and function, with a more severe impact on emotion and symptoms.

Rosacea not only has a negative impact on the QOL but also affects the psychological health of the patients. Rosacea is associated with multiple comorbidities.⁴³ The most common associated psychosocial comorbidities.^{24,44–46} And there is a strong correlation between depression and rosacea, the more severe the rosacea, the more severe the depression.⁴⁷ In addition, emotional factors often act as triggers for rosacea, and patients are frequently exacerbated by emotional stress.²³ We used HADS to screen patients with rosacea for anxiety and depression. 44.8% of patients suffered from anxiety and 37.5% from depression. Both anxiety and depression were predominantly mild to moderate in our results, which is consistent with previous studies.^{48,49} In a sense, HADS is only a screening tool and does not accurately diagnose anxiety and depression, but in general, our study clearly indicates the presence of psychological problems of anxiety and depression in patients with rosacea.

From the perspective of the mechanisms of rosacea and anxiety and depression, recent advances in research have proposed the concept of influencing the gut-brain-skin axis in affecting rosacea comorbidity. Microecological dysbiosis is often observed in patients with psychiatric disorders, and psychological stressors induce various neurotransmitters or neuropeptides to impair the integrity of the gastrointestinal tract, leading to intestinal and systemic inflammation.^{11,50,51} In addition, rosacea may share some common pathophysiological features with depression and anxiety, and both share similar inflammatory pathways. Interleukin 17 is considered a key cytokine in the pathophysiology of neurological and psychiatric disorders and plays an important role in the development and exacerbation of rosacea. In addition, shared mediators include interleukin (IL)-1, IL-12, and MMP, among others.^{52–55} All of the above can explain the relationship between rosacea and anxiety and depression in some sense.

Although a large number of previous studies have analyzed the impact of rosacea on the QOL and mental health, there is little research on the different rosacea's clinical severity has different effects on QOL and mental health. In our study, there were statistically significant differences in the level of impaired QOL and the incidence of anxiety and depression of different severity. And of note, we found that the more severe the disease, the greater its impact on QOL, and the higher the incidence of anxiety and depression in patients. A systematic review also concluded the negative impact on QOL appeared to be associated with disease severity.⁴² This variability and this trend are very significant from the IGA grouping. While from the CEA grouping, there is no significant variability between the groups. CAE can only evaluate the facial erythema of the patient at the time of consultation. While IGA considers not only facial erythema but also papules, phymatous changes, and other conditions. IGA can better reflect the overall situation of the patient's face, which means that the IGA is more representative

of the severity. These differences between the two scales seem to explain our results. Moreover, Differences in QOL impact between different skin subtypes of rosacea were found in a study, with patients with the papulopustularpersistent (PP), and phymatous (PH) rosacea subtypes likely to carry the greatest QOL burden.⁵⁶ Therefore, symptoms other than erythema, such as papules, pustules, and phymatous changes, may have a greater impact on the patient, we suspect that this may be associated with papules pustules and phymatous changes often combined with facial erythema, as well as uncomfortable symptoms such as tingling, and the treatment cycle is longer.

Secondly, we performed a correlation analysis of the severity with the grade of QOL and the severity of anxiety and depression, respectively. From our findings, both the degree of QOL affected and the severity of anxiety and depression were statistically positively correlated with the severity of rosacea. Oussedik et al concluded that QOL in patients with rosacea was affected by : (1) physiological factors such as pain, irritation, burning, and dryness; (2) psychosocial factors, such as anger, depression, humiliation, worry, embarrassment, social phobia, anxiety or frustration; And (3) occupational factors such as lost days of work, reduced job opportunities or pharmacoeconomic considerations.²⁰ We speculate that the more severe the clinical symptoms of rosacea, the more the above factors are affected, so the greater the impact on the patient.

As opposed to many other diseases such as hypertension and diabetes, patients with skin diseases bear their disease for the world to see. For the patients with rosacea, the easiest point for others to notice is the facial redness and pustules, which are exacerbated by excitation such as tension and elevated temperatures, leading to psychological problems such as avoidance, low self-esteem, anxiety, and depression. However, the current treatment mainly focuses on clinical symptoms and signs, and the impact on the patient's mood and QOL is often overlooked. Therefore, dermatologists should pay attention to the psychological state and QOL of patients, especially those with clinically severe symptoms of rosacea. A small case series suggests that cognitive-behavioral therapy conducted by an experienced clinical psychologist may help alleviate clinical symptoms in patients with severe rosacea due to social anxiety from blushing.⁵⁷ By recognizing the psychosocial burden of rosacea, doctors can treat patients more comprehensively and strive for better outcomes.

Conclusion

In this way, combined disease severity and health-related QOL assessments provide a better insight into the disease burden on health status and overall functioning. The QOL was greatly impaired and should not be ignored among patients with rosacea. Clinicians should raise awareness of the rosacea-related QOL impacts, especially in patients with severe clinical symptoms. And it is recommended that patients with severe clinical symptoms of rosacea should seek psychological help.

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Disclosure

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