Evaluation of psychiatric morbidity and quality of life in patients with acne vulgaris

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Background
The influence of acne on body image is believed to be the main factor associated with psychological morbidity. As the face is almost always the site of involvement of acne, its presence can alter one's perception of body image. Psychiatric disorders can develop secondary to acne vulgaris.

Aim of the work
This work was carried out to evaluate the psychological morbidity and effects of acne vulgaris on quality of life.

Patients and methods
A total of 140 patients with acne vulgaris were assessed for severity of acne using the acne severity scale and for depressive and anxiety disorder using the Hamilton Rating Scale for Depression and Hamilton Anxiety Rating Scale. Quality of life was assessed using the Dermatology Life Quality Index (DLQI).

Results
There were a statistically significant relation between acne severity and severity of depression and anxiety on assessment scales. The relation between acne severity and DLQI was statistically significant. In most patients with mild acne severity, a minor effect on DLQI was present, whereas in most patients with severe acne, severe effects were present.

Conclusion
Treatment needs to address both the primary skin condition and the psychiatric manifestations.

Introduction

Acne vulgaris is a chronic inflammatory disorder of the pilosebaceous unit.

Acne can probably be exacerbated by psychological stress. The influence of acne on body image is believed to be the main factor associated with psychological morbidity. As the face is almost always the site of involvement of acne, its presence can alter one's perception of body image. Psychiatric disorders can develop secondary to acne vulgaris (Niemeier et al., 2002).

More than a cosmetic problem, acne can produce anxiety, depression, and other psychological problems that affect patients' lives in ways comparable with life-threatening or disabling diseases. Emotional problems because of the disease should be taken seriously and included in the treatment plan. A purely dermatological therapy may not achieve its purpose. Even mild to moderate disease can be associated with significant depression and suicidal ideation, and psychologic change does not necessarily correlate with disease severity. Acne patients particularly have

social limitations and reduced quality of life (QOL) (Niemeier et al., 2006).

Psychic comorbidities in acne are probably greater than generally assumed. Attention should be paid to psychosomatic aspects, especially if there is suspicion of depressive-anxious disorders, particularly with evidence of suicidal tendencies, body dysmorphic disorders, or also of disrupted compliance. Therefore, patients who report particularly high emotional distress or dysmorphic tendencies because of the disease should be treated adequately, if possible, by interdisciplinary therapy. The dermatologist must have some knowledge of the basics of psychotherapy and psychopharmacology, which sometimes must be coupled with systemic and topical treatments of acne in conjunction with so-called psychosomatic basic treatment (Niemeier et al., 2002).

The impact of acne on QOL is a very important component of its overall morbidity and is often the primary consideration in deciding whether or not to initiate therapy (Cotterill and Cunliffe, 1997). Acne patients reported levels of social, psychological, and emotional problems that were as great as

those reported by patients with bronchial asthma, epilepsy, diabetes, back pain, or arthritis (Mallon *et al.*, 1999). Irrespective of psychiatric morbidity, skin diseases can markedly affect patients' QOL (Finlay, 1998). QOL has been defined as a useful measure that assesses the functioning, well-being, and life satisfaction of an individual. QOL refers to not only the subjective sense of well-being but also objective indicators such as health status and external life situations. QOL is emerging as one of the recent trends in assessing treatment response from the patient's point of view (Martin *et al.*, 2001).

To date, studies on the association between psychiatric morbidity and QOL have focused on a specific disease or on a small group of diseases, and no single study has described and compared the effect of psychological distress on the burden of a wide variety of skin conditions with different severity levels (Gupta and Gupta, 1998). Many studies have pointed out complex, mutual relationships between the psyche and the skin. There is extensive literature on the relationship between emotional stress and skin diseases (Picardi and Abeni, 2001). Furthermore, dermatologists commonly believe that psychiatric disorders are frequent in their patients, and several studies confirm this opinion (Aktan *et al.*, 1998).

In addition to any causal mechanism linking psychiatric morbidity and dermatological diseases, it is important to consider the consequences of the interrelation between these two conditions (Picardi *et al.*, 2000).

Patients and methods
Study design
This study is a cross-sectional one.

Ethical considerations
* An informed written consent taken from patients.
* Explanation of the study aim in a simple manner to be understood by the common people.
* No harmful maneuvers performed or used.
* All data considered confidential and will not going to be used outside this study without patient's approval.
* Researcher phone number and all possible communicating methods were identified to the participants to return at any time for any explanation.

Study site
This study was carried out in the dermatology clinic of Suez Canal University Hospital at Ismailia city.

Sample size calculation
The following equation was used to calculate the sample size:

$$n = \left[\frac{Z\alpha \sqrt{P_1(1-P_1)}}{E} \right]^2,$$

where *n* is the sample size, *P*: prevalence of psychiatric morbidity of patients with acne vulgaris (44%) (Kellett and Gawkrodger, 1999), *Z*α: a percentile of the standard normal distribution determined by 95% confidence level=1.96, *E*: the width of confidence level (SE × *P* × *Z*), and SE: 0.1.

On substitution: *n* = 127 10% dropout will be added to the sample size; thus, the total sample size will be 140.

The severity of acne was graded using the Comprehensive Acne Severity Scale (Lehmann *et al.*, 2002). This scale comprises three categories:

Mild acne: fewer than 20 comedones or fewer than 15 inflammatory lesions or a total lesion count lower than 30.

Moderate acne: 20–100 comedones or 15–50 inflammatory lesions, or a total lesion count of 30–125.

Severe acne: more than five cysts, or comedone count greater than 100, or a total inflammatory count greater than 50, or a total lesion count greater than 125.

Inclusion criteria
(1) Patients with acne vulgaris affecting the face.
(2) Males and females.
(3) Any age group.

Exclusion criteria
(1) Patients with any other chronic skin diseases.
(2) Patients with chronic medical and surgical conditions.
(3) Patients with organic brain syndrome or chronic mental illness.

Methods
Assessment of history.

General examination: these were carried out to exclude patients with chronic medical and surgical conditions.

Dermatological examination and scoring of acne
These steps were performed to exclude patients with any other chronic skin diseases and patients with chronic medical and surgical conditions, and also

to exclude patients with organic brain syndrome or chronic mental illness.

Dermatological assessment of psychiatric morbidity

Twelve-item General Health Questionnaire
This questionnaire consists of 12 items; each item has a score from 0 to 3. The score can range from 0 to 36 (Goldberg, 1992).

Scores of about 11–12 are normal.

A score more than 15 indicates evidence of stress.

A score more than 20 suggests severe problems and psychological distress.

A 17-item Hamilton Rating Scale for Depression
This scale consists of 17 items; nine of the items are scored on a five-point scale from 0 to 4. The remaining eight items are scored on a three-point scale from 0 to 2. Scores can range from 0 to 54. Scores between 0 and 6 indicate a normal individual with respect to depression, scores between 7 and 17 indicate mild depression, scores between 18 and 24 indicate moderate depression, and scores over 24 indicate severe depression (Hamilton, 1960).

Hamilton Anxiety Rating Scale
Hamilton Anxiety Rating Scale (HAM-A) consists of items and a five-point scale for each of the 14 items. Seven of the items specifically address psychic anxiety and the remaining seven items address somatic anxiety. For the 14 items, the values on the scale range from 0 to 4: 0 means that there is no anxiety, 1 indicates mild anxiety, 2 indicates moderate anxiety, 3 indicates severe anxiety, and 4 indicates very severe or grossly disabling anxiety. The total anxiety score ranges from 0 to 56. The seven psychic anxiety items elicit a psychic anxiety score that ranges from 0 to 28. The remaining seven items yield a somatic anxiety score that also ranges from 0 to 28 (Hamilton, 1969).

Dermatology Life Quality Index
In this tool, QOL items form five general groupings: (I) Physical symptoms and somatic complaints. (II) Activities of daily living (including functional status, personal care, and grooming). (III) Social activities and functioning. (IV) Experiences at work or school or both. (V) Self-perception (Finlay, 1998).

The Dermatology Life Quality Index (DLQI) questionnaire is designed for use in adults. It is self-explanatory and can be simply handed to the patient, who is asked to answer it without the need for a detailed explanation. It is usually completed in 1 to 2 min.

The scoring of each question is as follows:

Very much	Scored 3
A lot	Scored 2
A little	Scored 1
Not at all	Scored 0
Not relevant	Scored 0
Question unanswered	Scored 0
Question 7: 'prevented work or studying'	Scored 3

The DLQI is calculated by summing the score of each question, resulting in a maximum of 30 and a minimum of 0. The higher the score, the more the quality of life is impaired. The DLQI can also be expressed as a percentage of the maximum possible score of 30.

Meaning of DLQI scores:

0–1 = No effect at all on the patient's life quality.
2–5 = Small effect on the patient's life quality.
6–10 = Moderate effect on the patient's life quality.
11–20 = Very large effect on the patient's life quality.
21–30 = Extremely large effect on the patient's life quality.

Detailed analysis of the DLQI
The DLQI can be analyzed under six headings as follows:

Symptoms and feelings	Questions 1 and 2	Score maximum 6
Daily activities	Questions 3 and 4	Score maximum 6
Leisure	Questions 5 and 6	Score maximum 6
Work and school	Question 7	Score maximum 3
Personal relationships	Questions 8 and 9	Score maximum 6
Treatment	Question 10	Score maximum 3

The scores for each of these sections can also be expressed as a percentage of either 6 or 3.

Results
In this study, the patients were in age group 14–27 years, mean age 19.09 ± 2.53 years. Most of the patients were in the age group 18–22 years (52.9%), whereas only 2.1% of the patients were 26 years or more. Most of the patients studied were males (65.7%). Most of the patients had moderate form of acne, whereas about one-quarter of the patients had the severe form. In all, 28.6% of the patients had a mild form of acne.

In most of the patients, the effect of the disease on their lives was minor (42.9%), whereas in 33.6% of the patients, it was very large. None of the patients reported an extremely large effect, whereas only 6.4% reported no effect of the disease on their lives.

According to the HAS score, 40% of the patients had no anxiety. The most common degree of anxiety was mild anxiety (42.9%) and only 6.4% of the patients showed severe anxiety. Overall, 60% of the patients had no depression, 31.5% of the patients studied had mild depression, whereas only 2.1% of the patients had severe depression.

The relation between severity of acne and DLQI is statistically significant. In most patients with mild acne severity, the effect on DLQI was small, whereas in most patients with severe acne, the effect was very large as shown in Fig. 1.

Table 1 shows that the relation between acne severity and the HAS score is statistically significant. Only one of the patients with mild acne had severe anxiety (2.5%), whereas 20.6% of patients with severe acne had severe anxiety.

Table 2 shows that the relation between the severity of acne and the HAS score for depression is statistically significant. None of the patients with mild acne had

Figure 1
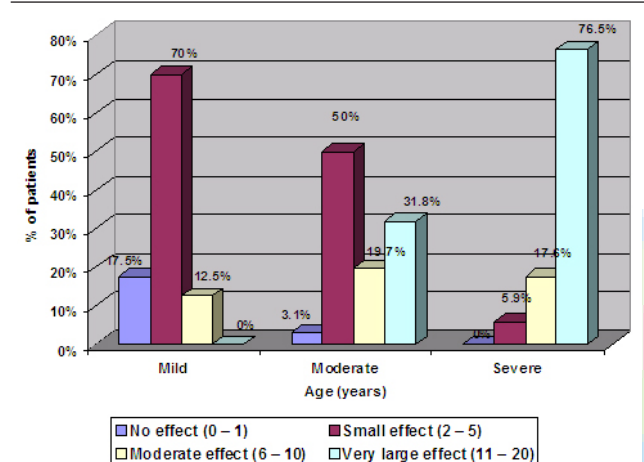
Relation between Dermatology Life Quality Index and objective assessment of acne severity of patients with acne vulgaris.

Table 1 Relation between the Hamilton Anxiety Scale score and objective assessment of acne severity of patients with acne vulgaris

Objective assessment of acne severity	Hamilton Anxiety Scale [n (%)]			
	No anxiety	Mild anxiety	Moderate anxiety	Severe anxiety
Mild	36 (90)	2 (5)	1 (2.5)	1 (2.5)
Moderate	20 (30.3)	44 (66.7)	1 (1.5)	1 (1.5)
Severe	0 (0)	14 (41.2)	13 (38.2)	7 (20.6)

$\chi^2 = 108.09$; $P = 0.001$ (statistically significant).

Table 2 Relation between the Hamilton Rating Scale Score for Depression and objective assessment of acne severity of patients with acne vulgaris

Objective assessment of acne severity	Hamilton Rating Scale for Depression [n (%)]			
	Normal	Mild depression	Moderate depression	Severe depression
Mild	34 (85)	6 (15)	0 (0)	0 (0)
Moderate	50 (75.8)	13 (19.7)	3 (4.5)	0 (0)
Severe	0 (0)	25 (73.5)	6 (17.6)	3 (8.8)

$\chi^2 = 71.7$; $P = 0.001$ (statistically significant).

severe depression, whereas 8.8% of patients with severe acne had severe depression and 17.6% had moderate depression.

Discussion

In this study, we evaluated the prevalence of psychiatric morbidity in patients with acne vulgaris and to what extent the QOL in these patients was affected. Also, this study attempted to determine whether there is a relation between severity of acne and psychiatric morbidities. The study group ranged in age from 14 to 27 years. A similar study showed that the peak prevalence of acne vulgaris was between 14 and 29 years of age (Schäfer *et al.*, 2001). Also, Garner (2003) found that the peak prevalence of acne occurred at 17 years of age. In contrast, Collier *et al.* (2008) found that the prevalence of acne was 50.9% in patients 20 to 29 years of age, 35.2% in patients 30 to 39 years of age, and 26.3% in patients 40 to 49 years of age, whereas the prevalence was 15.3% in patients 50 years of age and older.

In this study, about 65.7% of the patients were males, which is compatible with androgens being a potent stimulus to sebum secretion, whereas 34.3% were females. Similarly, the study by Schäfer *et al.* (2001) showed that acne was more prevalent in males, 29.9%, than females, 23.7%. In contrast, Mbuagbaw *et al.* (2007) found that acne was more frequent in females, 52.9%, than in males, 47.1%; this difference may have been because of the younger age of the study group, ranging in age from 10 to 21 years. Also, the larger sample size may have contribute toward the difference as of 585 adolescents, 350 had acne, and the study of Uhlenhake *et al.* (2010) showed that 65% of acne patients were females, whereas 35% of acne patients were males.

In this study, in most of the patients studied (42.9%), acne exerted a small effect on their lives, whereas in 33.9%, there was a very large effect on their lives, and in only 6.4% was there no effect of acne on their lives. In this study, in most of the patients with mild severity of acne, there was a small effect on DLQI, whereas in most of the patients with severe acne, there was a very large effect. Similarly, Martin *et al.* (2001) observed that QOL scores correlated with the severity of acne. Similarly, Pawin *et al.* (2007) reported that 48% of the patients with acne indicated that their daily life was affected, which varied with the perceived severity of acne (39% for mild acne, 52% for moderate acne, and 67% for severe acne). The results of the Rapp *et al.* (2004) study also suggested that emotional states may impact the quality of patients' lives and satisfaction in

patients with acne; they analyzed the association of acne with trait anger (TA) and its impact on QOL. The authors studied 479 patients and compared respondents who reported high TA with those with low TA in terms of outcome variables. High TA was correlated inversely with global QOL ($P < 0.001$) and skin-related QOL ($P < 0.002$). Also, a cross-sectional survey of 200 adolescents aged 15 to 18 years used two health-related QOL questionnaires: the Children's Dermatology Life Quality Index and the Cardiff Acne Disability Index; acne was reported in 83% of teenagers, and nine patients scored between 17 and 30%, which indicated moderate impairment, whereas three scored more than 33%, which indicated severe impairment (Walker and Lewis-Jones, 2006).

This study showed the existence of clinically significant depression and anxiety. The prevalence of depression among the studied group was 40%, whereas the prevalence of anxiety among them was 60%. Similarly, the study by Srivastava et al. (2008) of 46 patients with acne, who used the same methods, also reported the presence of clinically significant depression 39.1%, but reported a lower prevalence of anxiety, 4.35%, in their study; this might have been because of the small sample size and also the high prevalence of anxiety in the Egyptian society as earlier studies of psychiatric morbidity among university students in Egypt showed that anxiety in general was diagnosed in 36% of the study sample (Okasha et al., 1977). Pawin et al. (2007) also reported that 56.5% in patients with acne had anxiety and 58.2% of acne patients felt lonely. Javad et al. (2010) also reported that 68.3% in patients with acne had anxiety. However, in the study of Uhlenhake et al. (2010), a retrospective examination of patient information from a medical claims database was carried out using the Total Resource Utilization Benchmarks, which included age, sex, comorbid depression, antidepressant utilization, and acne treatment modality; a low prevalence of clinical depression was present in 8.8% of acne patients, and this may have been because of the high prevalence of depression in our society as Okasha et al. (1988) showed that the prevalence rates of depression in general among selected samples from an urban and a rural population in Egypt were found to be 11.4 and 19.7%, respectively. Also, the Purvis et al. (2006) study measured self-reported acne, depressive symptoms, anxiety, and self-reported suicide attempts and showed that the overall response rate in this study was 64.3%. This study reported a positive relation between acne vulgaris severity, Hamilton Rating Scale for Depression (HAM-D), and Hamilton Rating Scale for Anxiety (HAM-A). In our study, 20.6% of patients with severe acne have severe anxiety, whereas only 2.5% of patients with mild acne had severe anxiety; also, 8.8% of patients with severe acne had

severe depression and 17.6% had moderate depression, whereas none of the patients with mild acne had severe depression. Similarly, Uslu et al. (2008) carried out a cross-sectional analysis of 600 high-school students who completed the General Health Questionnaire and the Rosenberg Self-Esteem Scale; in this study, there was a direct correlation between severity of acne and symptoms of anxiety, depression, and lower self-esteem on the basis of responses to the General Health Questionnaire and Rosenberg Self-Esteem Scale. In contrast, a previous study of 2657 high-school students reported no correlation between acne severity and HAM-D or HAM-A scores; this may have been because of the larger sample size of their study (Aktan et al., 2000).

This study found no sex differences in HAM-D and HAM-A scores. A previous study also found no sex differences in the acne QOL scale and the Hospital Anxiety and Depression scale (Yazici et al., 2004). In contrast, Uhlenhake et al. (2010) found that females were reported to have depression much more than males up to double 10.6% females versus 5.3% males; also, Aktan et al. (2000) found that the Hospital Anxiety and Depression subscale scores of girls were significantly higher than those of boys in the acne group.

Methodology including the use of a disease-specific measure for the assessment of QOL of patients with acne vulgaris and the collaborative work of a psychiatrist and a dermatologist were important in gaining detailed insight into this relatively recent area for research, which has direct treatment implications. However, the limitations of the study were the absence of a control group and longitudinal follow-up of the study sample both before and after treatment.

Finally, this study found that acne patients had a higher prevalence of psychiatric disorder than the general population and a higher rate of life impairment; this should be considered for early identification and optimal management.

Conflicts of interest
None declared.

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