ORIGINAL ARTICLE

Assessment of Life Quality Index Among Patients with Acne Vulgaris in a Suburban Population

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Abstract

Background and Aims: Acne vulgaris affects about 85% of adolescents, often extending into adulthood. Psychosocial impact of acne on health-related quality of life (QoL) has been identified, but it remains under-evaluated, especially in Indian patients. This study was aimed to assess the impact of acne and its sequelae on the QoL. **Materials and Methods:** This was a hospital-based, prospective, cross-sectional study done between June and November 2014 on 114 consenting patients above 15 years of age with acne vulgaris. Acne vulgaris and its sequelae were graded, and QoL was assessed by using Dermatology Life Quality Index (DLQI) questionnaire. **Results:** Most cases (64%) were between 15 and 20 years. Females (57%) outnumbered males. Facial lesions (61.4%) and grade II acne were most common. Mean DLQI score was 7.22. DLQI scores were statistically influenced by the age of the patient, duration and grade of acne, acne scar, and postacne hyperpigmentation. **Conclusion:** This study showed significant impairment of QoL in acne patients. Assurance and counseling along with early treatment of acne vulgaris are important to reduce disease-related psychosocial sequelae and increase the efficacy of treatment.

Key Words: *Acne vulgaris, Dermatology Life Quality Index, influencing factors, quality of life*

What was known?
Acne vulgaris affects the psychosocial well-being of patients. Facial acne and severe acne are associated with a worsening of quality of life (QoL). There is a scarcity of studies on QoL issues among acne patients in the Indian scenario.

Introduction

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous unit characterized by seborrhea, open and closed comedones, papules, pustules, and in more severe cases, nodules and pseudocysts. It commonly affects the face, upper chest, and upper back.[1] More than 85% of adolescents suffer from acne and in 50% cases, it extends into adulthood.[2] The major complications of acne are scarring and psychosocial distress which persists long after active lesions have disappeared.[3]

Psychosocial effects of acne vulgaris have been long identified, but this sequelae of acne remain under evaluated. Patients with acne have been shown to have levels of social, psychological, and emotional impairments similar to serious diseases such as asthma, epilepsy, diabetes, or arthritis.[4] These patients are more prone to embarrassment, social withdrawal, depression, anxiety, and anger.[5]

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Evaluation of acne using only clinical assessment does not capture the impact of the disease adequately. Assessment of impact on health-related quality of life (QoL) is needed to fully characterize the overall disease burden and effectiveness of treatment.[6] WHO defines QoL as the "individual's perception of their position in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns."[7] The use of QoL questionnaires can help us adequately understand how acne affects the patient on a day-to-day basis and can aid in assessing the efficacy of therapy and design more targeted interventions. One such questionnaire is the Dermatology Life Quality Index (DLQI). Developed by Finlay and Khan, DLQI is widely used in research and clinical practice to assess changes in health-related QoL, as it is a sensitive measure.[8,9] Studies on the impact of acne on QoL have been evaluated in US, UK, Spain,

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Brazil, Iran, Malaysia, and Greece.[10-17] Very few similar studies have been conducted in India. The objective of this study was to assess the impact of acne, and its sequelae on the QoL in a Suburban South Indian population.

Materials and Methods

It was a hospital-based, prospective, cross-sectional study done in the Dermatology and STD outpatient department of a tertiary care teaching hospital from June to November 2014 after approval by the Institutional Research and Ethical Committee.

Patients aged 15 years and above with a clinical diagnosis of acne vulgaris were included in the study after obtaining informed written consent in Tamil or English. Patients with a known history of mental disorder or with concurrent somatic diseases that can affect their mental status, patients who used topical and systemic drugs known to predispose them to acne, and nonconsenting patients were excluded.

A detailed history pertaining to socio-demographic data, presenting complaints, duration of acne, etc., were elicited. Cutaneous examination was done by a single dermatologist on all patients and the following were noted: (i) Type of skin (dry/normal/oily), (ii) site of lesion (face, chest, or back), (iii) grade of acne, (iv) postacne hyperpigmentation (present/absent), and (v) acne scars.

Acne vulgaris was graded as:[18]

- Grade I: Comedones, occasional papules
- Grade II: Papules, comedones, few pustules
- Grade III: Predominant pustules, nodules, abscesses
- Grade IV: Mainly cysts, abscesses, widespread scarring.

Acne scars (all types included) were graded as:[3]

- Mild: <5 scars
- Moderate: 5–10 scars
- Severe: >10 scars.

The DLQI questionnaire, first introduced by Finlay and Khan, in 1994[8] was used as the study instrument for this study after obtaining a formal written permission. DLQI is a validated questionnaire which grades QoL by assessing the following domains: (a) physical symptoms and feelings (questions 1 and 2), (b) daily activities (questions 3 and 4), (c) leisure (questions 5 and 6), (d) work/school (questions 7), (e) personal relationships (questions 8 and 9), and (f) treatment (question 10). Each question is scored as "very much" (score 3), "a lot" (score 2), "a little" (score 1), and "not at all" (score 0), keeping in mind the problems faced the previous week due to the disease. Final DLQI score is the sum of all scores (range 0–30). High scores indicate poor QoL.

DLQI score interpretation is done as follows:

- 0–1 no effect on patient's life
- 2–5 small effect on patient's life
- 6–10 moderate effect on patient's life
- 11–20 very large effect on patient's life
- 21–30 extremely large effect on patient's life.

Patients were asked to fill up the DLQI questionnaire (Tamil or English) without assistance. English version of the DLQI was translated into Tamil by two bilinguals. Forward and backward translation were done by different translators and validated by two other members.

Statistical analysis

The data collected were analyzed using IBM SPSS Statistics software version 20. Comparison of categorical variables between independent groups was done with Chi-square test. Analysis of variance was done with *post-hoc* Tukey's test to compare DLQI scores with various categorical variables. Value of $P < 0.05$ was considered significant and $P < 0.01$ as highly significant.

Results

The study population included 114 cases with females (57%) outnumbering males. The mean age was 19.39 years. Furthermore, maximum patients (64%) were among 15–20 years.

Facial acne was the most common (61.4%), followed by involvement of both face and back together (15.7%). There was no statistically significant association between gender and site of acne [Table 1].

Table 1: Comparison of gender with site of acne, grade of acne and acne scar*

	Gender (number of patients)		*P*
	Male	Female	
Site of acne			
Face	29	41	>0.05
Back	1	2	
Face and chest	6	7	
Face and back	8	10	
Chest and back	0	1	
Face, chest, and back	5	4	
Grade of acne			
I	7	10	>0.05
II	30	47	
III	10	8	
IV	2	0	
Acne scar			
Mild	15	12	<0.05
Moderate	13	13	
Severe	14	15	
Absent	7	25	

*Pearson Chi-square test

Duration of acne was <6 months in most cases (42%). The majority (61.4%) had oily skin followed by patients with normal skin (36.8%). Association between the type of skin and grade of acne was statistically highly significant ($P < 0.001$) as seen in Table 2.

Grade II acne was the most common clinical type (67.5%), followed by Grade I and III (14.9% each) [Figures 1-3]. Furthermore, males had more severe disease: Among Grade III acne, 55.6% were males, and all Grade IV acne were males. However, this gender difference was not statistically significant [Table 1].

Acne scars were seen in 73% cases [Figure 4]. Also, acne scars were more common in males (86%) than females (61.5%), which was statistically significant ($P < 0.05$) as seen in Table 1. Furthermore, grade of acne also influenced the degree of scars with a high statistical significance ($P < 0.001$) as mentioned in Table 2 and Figure 5.

Postacne hyperpigmentation was noted in 75.4% [Figure 1]. Statistically highly significant association was noted between the grade of acne and postacne hyperpigmentation ($P < 0.001$) as seen in Table 2.

Dermatology Life Quality Index scores

The DLQI scores ranged from 1 to 20 with mean DLQI score of (7.22 ± 4.45) which showed an impairment of 24%. Mean DLQI scores were highest among >25 year olds, with grade IV acne, severe scars, and postacne hyperpigmentation [Table 3].

Interpretation of Dermatology Life Quality Index scores

Ninety-one percentage patients had elevated DLQI scores, with mild effect (score 2–5) being the most common (33.3%). None of the patients had DLQI score >20 (extremely large effect) [Table 4].

Nine out of 17 cases with grade III acne and all grade IV acne had a very large effect on patient's life [Table 5]. Furthermore, 13 out of 29 cases with severe acne scars had DLQI score in range of 11–20 interpreted as very large effect [Table 6].

Figure 1: Open and closed comedones with postacne hyperpigmentation

Table 2: Comparison of grade of acne with type of skin, acne scars, and postacne hyperpigmentation*

	Grade of acne (number of patients)				*P*
	I	II	III	IV	
Type of skin					
Dry	0	2	0	0	<0.001
Normal	14	27	0	0	
Oily	3	48	18	2	
Acne scars					
Mild	8	19	0	0	<0.001
Moderate	0	22	5	0	
Severe	0	14	13	2	
Absent	9	23	0	0	
Postacne hyperpigmentation					
Present	6	61	18	2	<0.001
Absent	11	17	0	0	

*Pearson Chi-square test

Table 3: Mean DLQI scores according to age, gender, duration of acne, grade of acne, acne scar, postacne hyperpigmentation§

	Mean DLQI	SD	*P*
Age (years)			
15-20	7.00	4.40	<0.05
21-25	7.03	4.44	
>25	10.13	4.51	
Gender			
Male	7.84	4.88	>0.05
Female	6.83	4.09	
Duration of acne (months)			
0-6	6.06	4.07	<0.05
7-12	6.76	4.22	
13-24	9.24	4.67	
25-36	9.60	3.85	
>36	8.31	5.04	
Grade of acne			
I	4.12	3.39	<0.001
II	7.19	4.04	
III	9.28	4.81	
IV	16.50	3.54	
Acne scar			
Mild	5.93	4.04	<0.05
Moderate	6.96	3.89	
Severe	9.17	5.10	
Absent	6.75	4.21	
Postacne hyperpigmentation			
Present	8.04	4.54	<0.001
Absent	4.68	3.02	

§ANOVA: Analysis of variance, SD: Standard deviation, DLQI: Dermatology Life Quality Index

Table 4: Interpretation of DLQI scores

DLQI interpretation	Number of patients (%)
No effect (0-1)	10 (8.8)
Mild effect (2-5)	38 (33.3)
Moderate effect (6-10)	37 (32.5)
Very large effect (11-20)	29 (25.4)
Extreme large effect (21-30)	0

DLQI: Dermatology Life Quality Index

Table 5: Distribution of grade of acne based on DLQI interpretation

Grade	No effect (0-1)	Mild effect (2-5)	Moderate effect (6-10)	Very large effect (11-20)	Extreme large effect (21-30)	Total
I	4	8	4	1	0	17
II	6	26	29	17	0	78
III	0	4	4	9	0	17
IV	0	0	0	2	0	2
Total	10	38	37	29	0	114

DLQI: Dermatology Life Quality Index

Table 6: Distribution of acne scar based on DLQI interpretation

Acne scar	No effect (0-1)	Mild effect (2-5)	Moderate effect (6-10)	Very large effect (11-20)	Extreme large effect (21-30)	Total
Mild	4	10	9	4	0	27
Moderate	1	11	9	6	0	27
Severe	2	7	7	13	0	29
Absent	3	10	12	6	0	31
Total	10	38	37	29	0	114

DLQI: Dermatology Life Quality Index

Factors affecting Dermatology Life Quality Index score

Statistically significant association was noted between DLQI scores and variables such as the age of the patient, duration and grade of acne, acne scar, and postacne hyperpigmentation [Table 1].

Discussion

This hospital-based study included 114 self-reported cases of acne vulgaris in 6 months. Durai and Nair[19] included 140 cases over 5 months while Kulthanan *et al.*[2] included 110 cases in 1-year. However, some school-based studies[17,20] had a much higher number of participants as in these studies acne was actively searched for in the study population and not self-reported.

Lesions of acne start around 15 years of age[10] and may persist even into the thirties and forties.[1] This study included cases 15 years and above. The mean age of the study population was 19.39, while Tasoula *et al.*[17] reported a mean age of 15.77 among the population of 11–19 years.

Mean DLQI scores in this study increased with increasing age: 10.12 in (>25) year old compared to 7.00 among 15–20 year olds. Severity of acne worsens as age advances, affecting QoL.[19,21,22] A possible explanation could be that in late adolescents

Figure 2: Erythematous papules and pustules with ice pick scars

Figure 3: Erythematous pustules with few nodules

Figure 4: Postacne scars

Figure 5: Nodulocystic acne with scars

and early adult life, peer and romantic relationships form an important component and thus appearance has significant weightage; comparatively, in early adolescence, family is still the key and appearance does not matter much.[17]

This study had 57% females which corroborated with other studies.[11,17,20,21] No gender difference in DLQI scores was noted in this study. Similar finding was reported by Durai and Nair[19] indicating both genders were concerned about their appearance and self-reported acne. This was in contrast to some studies, where females had higher DLQI scores.[21,23,24]

Samanthula and Kodali[25] found that 60.04% had acne for more than 1-year, while the majority (42%) in this study had acne for <6 months meaning patients presented early for treatment. Association between duration of acne and DLQI scores was statistically significant in this study ($P < 0.05$).

Facial acne alone constituted 61.4% cases though site of acne did not influence DLQI scores in this study. Durai and Nair[19] reported facial acne as most common (99.3%); site of acne did not show any significant association with the QoL. This was contradictory to earlier studies reporting severity of facial acne to correlate with worsening QoL.[26,27]

Increased sebum secretion is a major concurrent event associated with the development of acne. Kulanthan *et al*.[3] found two-thirds of acne patients to have oily skin. In this study, 61.4% had oily skin, and the relation between severity of acne and oiliness was statistically significant ($P < 0.001$).

The highest prevalence of grade II acne (67.5%) was encountered in this study while Durai and Nair[19] reported comedones to be most common (95%). No statistical association was noted between gender and grade of acne in this study.

A significant correlation between DLQI scores and grade of acne ($P < 0.001$) was observed in this study, which was in agreement to studies done in Greece, Iraq, Turkey, and France.[17,21] Few past studies have shown no such association.[28,29]

While some authors reported acne scars in 40.2%[30] and 25%,[31] Hayashi *et al*.[32] observed acne scars in 90.8% and opined that acne scars had a negative impact on patient's QoL. Seventy-three percentage of subjects in this study had acne scars. There was a statistically significant association between acne scars and DLQI scores in this study ($P < 0.05$). Furthermore, gender difference in acne scars in this study was statistically significant ($P < 0.05$).

Postinflammatory hyperpigmentation is a common complication of acne vulgaris, particularly in pigmented skin.[33] Postacne pigmentation was seen in 75.4% which was slightly higher when compared to earlier studies.[30,34] The statistical association of postacne hyperpigmentation with DLQI scores was highly significant ($P < 0.001$) in this study.

The mean DLQI score of (7.22) in this study showed an impairment of 24%. Mean DLQI in different studies ranged from 1.7 to 8.95.[2,12,17,19] Interestingly, it was found that few patients with grade II acne and some cases with mild scar had elevated DLQI scores which implied that even mild acne and scars can pose a cosmetic problem to some patients, diminishing their QoL.

The differences in the findings of various studies highlight the social, behavioral, and cultural factors, differences in population characteristics, individual perception, plus the study design, and assessment tool used. Though the study population in this research was Suburban, both genders did identify even mild acne as a significant problem and reported early for treatment. Furthermore, the effect of acne on the QoL of patients was significant.

Conclusion

This study showed significant impairment of QoL in acne patients. Worsening of QoL was observed with advancement in age, longer duration of disease, increase in severity of acne and acne scars, and the presence of postacne hyperpigmentation. There was no gender difference in the QoL scores. Few patients with low-grade of acne and with minimal scarring also presented higher DLQI scores, implying that even mild acne can lead to psychosocial morbidity. This study thus stresses the importance of assurance and counseling along with early treatment of acne vulgaris in reducing disease-related psychosocial sequelae and enhancing the efficacy of treatment.

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Nil.

Conflicts of interest

There are no conflicts of interest.

What is new?
The impact of acne vulgaris on QoL is more common than previously thought to be. The absence of gender difference in the scores implied that both males and females worry about their acne. The scores were not influenced by the site of acne. Patients having mild acne or minimal scarring can also present with worsening of QoL.

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