IMPACT OF POST-ACNE SCARS ON QUALITY OF LIFE AND ITS CORRELATION WITH SCAR SEVERITY

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ABSTRACT

Background- Present research intends to evaluate the impact of post-acne scars on quality of life.

Methods: The Prospective correlation cross-sectional study was effected out after enrolling 100 cases of post-acne scars aged 16 years or more in an institution based tertiary health care center. The quality of life of the patients was evaluated using the Dermatological Life Quality Index (DLQI) questionnaire and the acne scar severity was evaluated using the Goodman and Baron Quantitative grading scale. Institutional Ethics Committee clearance was obtained before the start of the study.

Results: The result showed that maximum patients, 62 %, were in the second decade, followed by 21 % patients who were in the 31 – 40 years age group. The gender-wise distribution showed that females contributed majority of the cases (51 %) and males contributed 49 % of the total cases. Only 30% of the patients had prior family history of post-acne scars. The mean age of onset of acne was 18.11 years whereas that of onset for post-acne scar was 21.43 years. The maximum DLQI score was 14 and mean DLQI score for acne scarring was 5.31. We found that, higher the grade of scarring more was the mean DLQI score. We found a positive correlation between DLQI and the post-acne scar severity total score and this was statistically significant.

Conclusion: Acne and acne scarring are influenced by non-dermatological aspects like perceptions, personality, age, social and cultural circumstances as well as disease characteristics such as onset, duration and severity. Assessing QOL first at baseline offers valuable insight into patient's perspectives. Our research demonstrated that post-acne scars significantly diminish the quality of life in young adults. The study's findings also suggest that the quality of life worsens with increased severity of scarring. Therefore,

individuals with acne should be treated promptly and effectively, to avoid acne scarring or to reduce its severity.

Keywords: Post-acne scars, quality of life, young adults

INTRODUCTION

Acne vulgaris as the name implies is one of the most common dermatological disorders with occurrence of about 90% in the young population. [1] The worrisome fact continues as the acne does not limit itself only to the adolescent phase but also has its mark into the later phases of life in around 12%-14% of cases with serious social as well as psychological repercussions.[2,3]

The face, back, and chest in particular, as well as other body regions with significant concentrations of pilosebaceous glands, are affected.[4] The prevalence of acne on face, back and chest is 92, 61 and 45% respectively.[5]

Not only the acne but also its blemishes once they are resolved are a condition of concern. These blemishes which are often referred to as "Post-acne scars" are a very well-known epilogue of acne vulgaris and may afflict about 95% of individuals having acne vulgaris. It is connected to the duration and severity of acne prior to receiving effective treatment. The condition thereby warrants prompt diagnosis and treatment of the condition is crucial for preventing acne scars and the resultant detrimental psychological and social impairments that occur from feelings of frustration, humiliation and low self-esteem.[6]

Delaying therapy has been linked to a higher degree of scarring.[7] This emphasizes the significance of severity scoring of acne scars in relation to assessing the acne severity, since ongoing scarring is indicative of increased severity overall.[5] Consequently, a number of scales and classifications have been developed -A qualitative scale, followed by a quantitative scale was recommended by Goodman and Baron.[8,9] Another scoring system which was put forth by Dreno et al.is the ECCA scale (échelle d'évaluation clinique des cicatrices d'acné).[10] The quantitative scoring for acne scars pioneered by Goodman and Baron however is universally applicable and this quantitative grading appears to be reasonably precise and reproducible between doctors and helps to give a meaningful severity score to each patient.[9] Hence we will use the same in this study to evaluate acne scar severity.

Quality of life (QOL)is a person's overall satisfaction with life and general sense of well being.

To assess how skin disorders affect a patient's life, numerous objective indices have been established. One such simple 10- item validated questionnaire is the Dermatology Life Quality Index (DLQI), that is frequently followed to assess the outcomes of dermatological conditions on the QOL in a standardized and objective manner.[11] Its validated Hindi/Marathi version are available on the original author's website for free use.

However, the irony is, although being one of the most common dermatological conditions, number of available researches on the psychological implications of acne scars in adolescents and adults are limited, and there is even less data on the influence these scar marks have on the quality of life in Caucasians.[6,12]

The present study was an attempt to decode the prevalence, demographic characteristics, effects and impairment associated with the post-acne scars on quality of life in Indian subjects (using DLQI). It also established a correlation of the QOL with the severity of the scars (using Goodman and Baron quantitative scale).

MATERIALS AND METHODS

The Prospective correlation cross-sectional study was conducted in the Dermatology out-patient department of an institution based tertiary health care centre in Maharashtra, India from August 2020 to July 2022 after enrolling 100 cases of post-acne scars aged 16 years or more. Institutional Ethics Committee clearance was obtained before the start of the study.

METHOD OF DATA COLLECTION:
- Demographic, social and clinical records of the patients were collated

- Purpose of the study was explained to the patient and/or his/her relatives and written informed consent was taken after assuring the responders about the confidentiality of the data.
- Data collection was done using pre-designed proforma

INCLUSION CRITERIA:
- Self-reported cases of both sexes with post-acne scarring, of age ≥16 years.

EXCLUSION CRITERIA:
- Patients who were excluded from the study were as follows:
1) Patients not willing to give consent.
2) Patients less than 16 years of age.

QUALITY OF LIFE ASSESSMENT:
The QOL assessment was done using a tailored and pre-validated questionnaire prepared on the guidelines of "Dermatological Life Quality Index" (DLQI) coined by Finley and Kahn.

Ten questions with four options scored from zero to three (0 being no effect, 1-minimal effect, 2-moderate effect, 3-severe effect), which means highest score was of 3 and lowest score of 0 was given to every question thus allowing the highest score of 30 and the lowest score of 0, for the modified DLQI score. Based on this grading used in DLQI, the concluding score was finally divided into 5 grades from 0 to 4. The questionnaire was self-administered.

The questionnaire was formulated to assess various aspects of QOL as follows -
1) Patients' perception/physical reaction
2) Psychological aspects
3) Interpersonal relationships
4) Efficacy and active involvement at home/work/school
5) Indications for medical intervention

The classification below of DLQI score as proposed by Hongbo, et al. after studying the association between DLQI and the patients' perceptions of their overall skin-related quality of life impairment, was followed as an aid for clinical implication of an individual's score calculated as above:

Score	Interpretation
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

STATISTICAL ANALYSIS:
To perform statistical analysis, SPSS software, version 20.0, was used. Spearman rank correlation test, chi squared test, etc. were used for correlation between the variables. Values with $P<0.05$ were considered as significant.

EVALUATING THE SCAR SEVERITY:
The scars were photographed and graded using the Goodman and Baron Quantitative Grading System. Acne scars were classified into 5 grades-A, B, C, D, E based on scar severity (mild, moderate, severe, papular, keloidal/hypertrophic respectively). This system took into consideration the type and quantity of scar based on a point system, instead of category. The final score ranged between 0 and 84.

RESULTS
Table 1: Demographic details

Age in years	N%
16-20	14 (14%)
21-30	62 (62%)
31-40	21 (21%)
>40	3 (3%)
Gender	

Males	49 (49%)
Females	51 (51%)
Occupation	
Health care worker	13 (13%)
Homemaker	8 (8%)
Manual worker	7 (7%)
Professional	51 (51%)
Student	21 (21%)
Residence	
Rural	37 (37%)
Urban	63 (63%)
Marital status	
Non-married	52 (52%)
Married	48 (48%)
Family history of post-acne scar	
Present	30 (30%)
Not present	70 (70%)

The result showed that maximum patients, 62 %, were in the 21–30 year age group, followed by 21 % patients in 31 – 40 year age group, 14 % in 16 – 20 year age group and least patients, 3 %, in more than 40 years age group. The gender-wise distribution is shown where females contributed majority of the cases (51 %) and males contributed 49 % of the total cases. Female preponderance was seen. We also saw the distribution of the patients according to their occupation. Majority of the cases, 51 % belonged to the professional occupation group, followed by 21 % being students which was followed by 13 % patients being health care workers. Home-makers contributed 8 % whereas manual workers contributed 7 % respectively. According to the residence-wise distribution of the patients, maximum patients belonged to the urban group with 63 %, and 37 % patients belonged to the rural group. The result showed the marital status-wise distribution of the patients. Maximum patients were non-married (52 %) and the rest (48 %) were married. The result showed that positive family history was found in only 30 % patients while majority, 70 % patients had no family history of post-acne scars.

Table 2: Type of skin, Location of acne and Location of post-acne scar among the study subjects

Type of skin	N%
Dry	12 (12%)
Normal	46 (46%)
Oily	42 (42%)
Location of acne	
Face	80 (80%)
Face, Back	10 (10%)
Face, Chest	3 (3%)
Face, Back, Chest	7 (7%)
Location of post-acne scar	
Face	95 (95%)
Face, Back	5 (5%)
Previous treatment for post-acne scar	
Yes	29 (29%)
No	71 (71%)

Majority of the patients, 46 % had normal skin type, followed by 42 % who had oily skin type and 12 % had dry skin type. The distribution of acne based on the location was as follows-80 % of the cases had acne only on their face, followed by 10 % having acne both on face and back, followed by 7 % who had acne on face, back and chest and only 3 % patients had acne on their face along with chest. Maximum patients had

their post-acne scars on the face alone, seen in 95 % cases whereas, 5 % patients had post-acne scars both on the face and back. Majority of patients, 71% had no prior treatment for post-acne scars whereas 29% had previous treatment for the same.

Table 3: Age at onset of acne and post-acne scar and duration before receiving treatment for acne and post-acne scar

Variables	Minimum	Maximum	Mean	SD
Age at onset of acne (years)	14	25	18.11	2.260
Duration before receiving acne t/t (months)	3	156	31.09	27.015
Age at onset of post-acne scar (years)	15	30	21.43	3.279
Duration of post- acne scars before t/t (months)	6	240	70.44	50.637

The table shows the age at onset of acne in which minimum age was 14 years and maximum age was 25 years, with mean age being 18.11 years. The mean duration before receiving treatment for acne in months was 31.09 months. The above table also shows the age at onset of appearance of post-acne scars in which youngest individual age reported was 15 years and the eldest one was 30 years, with the mean age being 21.43 years. The average period of post-acne scarring prior to treatment was 70.44 months.

Table 4: DLQI for post-acne scars and post-acne scar severity highest grade among the study subjects

DLQI	Impact on QOL	N%
Grade 0 (0 - 1)	No effect	19 (19%)
Grade 1 (2 - 5)	Small effect	35 (35%)
Grade 2 (6 - 10)	Moderate effect	34 (34%)
Grade 3 (11 - 20)	Very large effect	12 (12%)
Mean ± SD	5.31±3.59	
Post-acne scar severity highest grade		
B	45 (45%)	
C	48 (48%)	
E	7 (7%)	
Mean ± SD	11.45±3.89	

The table depicts the DLQI score for post-acne scar patients. 35 % of the patients had a score between 2 to 5 (Grade 1), followed by 34 % patients having score between 6 to 10 (Grade 2), 12 % patients had a score between 11 to 20 (Grade 3) and 19 % patients had a score of 0 to 1 (Grade 0). The DLQI assessment revealed the average of QOL to be 5.31 with its maximal reading accounting up to 14. The data also revealed that the most prevalent grade of scarring was the severe one i.e. grade C (48%), followed by grade B i.e. moderately scarred to grade E being the least(7%)(hypertrophic scars or keloids). The severity score can be averaged up to 11.45.

Table 5 : Mean DLQI score according to post-acne scar grading

Post-acne scar severity highest grade	Mean DLQI score	SD	p-value
B	4.73	3.353	0.041*
C	5.54	3.820	
E	7.43	2.936	

*: Statistically significant

This table depicts the mean DLQI score according to the post-acne scar severity grading. The mean DLQI score was the highest for grade E with 7.43, followed by grade C with 5.54 and 4.73 for grade B.

Correlation between DLQI and post-acne scar severity total score

Parameters	Value

r value	0.21
p value	0.037*

*: Statistically significant

The findings showed a positive correlation between DLQI and the post-acne scar severity total score.

DISCUSSION

Acne vulgaris is the most prevalent chronic skin problem that is almost universal in adolescents. Acne scarring which is an unfortunate consequence of acne, is a severe and permanent complication due to acne vulgaris, affecting approximately 95% of patients.[13] It is likely to be associated with physical as well as psychological distress, especially in the youth, which is the precursor to poor confidence levels and a reduced quality of life. 85% of individuals with scars due to acne have atrophic scars, but a lesser proportion of patients have hypertrophic scars as well as keloids.[4]100 patients who reported to the out-patient department with post-acne scars and were equal to or more than 16 years of age, participated in our study. In this study, we discovered that there was a female preponderance, seen in 51 % cases. The outcomes were in concordance to a study done by Chuah et al. in which 57 % of cases were females.[6] However, in another study done by Agrawal et al, males were comparatively more than the females and their observations were similar to the study by Kilkenny et al and this could be because males had more severe acne vulgaris, which further progressed to scarring.[14,15]In our study, when the skin type of the patients was assessed, we found that majority had normal skin type, 46 %, followed by oily skin in 42 % cases and 12% had dry skin. This was contrary to the results obtained by Kulthanan et al which showed that oily skin type constituted majority of the cases in 67 % followed by mixed type seen in 30 % cases.[16] In the present study, we observed that in 80% of the patients, face was the most commonly affected location of acne which was followed by face and back together, seen in 10 % of the cases and acne was seen on face along with chest in 3 % cases. Our results were congruent to a study which was carried out by Kulthanan et al, where face constituted the site in maximum number of cases, when the location of acne was studied.[16] When we studied the location of the scar, we found that face was involved in 95 % of the cases and only 5 % cases had the location of the scar on both face and back. This was consistent with the results of Chuah et al, where face was the most commonly involved location of acne scar.[6] The average age of onset of acne in the present paper was 18.11 years, whereas, in a study by Kulthanan et al, the primary episode of acne appeared from age group between 10 – 31 years having a median age of 15 years. In our study, we also saw that the mean duration before receiving treatment for acne was 31.09 months which was similar to the findings of Kulthanan et al.[16]According to the results of our study, the mean age at which a post-acne scar first manifested itself was 21.43 years which was in concordance with the inferences studied by Chuah et al. who evidenced that the mean age at which a post-acne scar first manifested itself was 18.5 years. The mean duration before seeking medical attention for acne scars was 70.44 months in the present research paper, which was in line with the observations by Chuah et al. [6]In the current study, we observed that 35% of the patients had their post-acne scar DLQI scores between 2- 5 (Grade 1), followed by 34 % patients in the 6 – 10 score range (Grade 2). 19 % patients had a DLQI score of 0 to 1 (Grade 0) and 12 % had a score between 11 to 20 (Grade 3) with the maximum score being 14. The analysis revealed a relatively better condition when contrasting the scarring grades with 35% of the subjects having a small impact of the same, followed by 34% population's QoL being moderately affected and 19%, surprisingly enough, being not affected at all. However, 12% population was such that , they were being severely affected by the scarring phenomenon.

The mean DLQI score was 5.31 among the patients. In our study, according to Quantitative Global Acne Scarring Grading System which is the scale developed by Goodman and Baron, majority of the patients had the highest grade of their post-acne scars as grade C, i.e., severe scarring, seen in 48% cases. This was followed by grade B, i.e., moderate scarring, seen in 45 % cases and 7% of cases had grade E comprising of hyperplastic keloidal or hypertrophic scars. The mean acne scar severity score was 11.45. The mean DLQI for grade E was the maximum with a score of 7.43 followed by DLQI score of 5.54 seen in grade C and 4.73 seen in grade B. Thus higher grade of scarring was associated with higher DLQI scores. This was statistically significant with a p-value of 0.041 (<0.05).Chuah et al. (2015) in their study which was carried out in young Singapore population reported an average of 5.61 DLQI for post-acne scars after studying 100 patients. This was similar to other crippling skin disorders like Behcet's syndrome as well as Darier's disease. Lower DLQI scores (49.1%) were the norm for those with mild acne scars. The DLQI score was high (13.3%) in few patients of mild post-acne scarring, nevertheless. Low DLQI scores were present in 6 patients (10.9%) with high amount of scarring.[6]Another research which was done on relatively larger sample size of around seven hundred twenty three adult patients with acne scars on face region by Tan J et al., 2021, showed the average DLQI of 6.26 for the scars of face post acne. Their study also revealed that around 19.3% of the subjects having a mild episode of the scarring condition felt that acne scars were an 'extremely large' or 'very large' concern, compared to 20.1% of people having moderate scars and 34% of cases with greater severity of the condition as per the scoring (P = 0.003). Greater scar severity was linked to higher Facial Acne Scar Quality of Life (FASQoL) scores (P = 0.001).[17]We found a positive correlation between the DLQI of patients and their post-acne scar severity score calculated by the Goodman and Baron Quantitative Scale. The study estimated coefficient of correlation of 0.21 and p-value of 0.037 (<0.05), the same positive correlation was statistically significant.

CONCLUSION

Acne and acne scarring are influenced by non-dermatological aspects like perceptions, personality, age, social and cultural circumstances as well as disease characteristics such as onset, duration and severity. Assessing QOL first at baseline offers valuable insight into patient's perspectives. In order to better understand a treatment modality's effectiveness and to tailor it to the specific needs of each patient, doctors may use QOL assessment during treatment. Patients having post-acne scarring who also suffer from depression or anxiety disorders may benefit from counselling or short psychotherapy, maybe in conjunction with psychotropic medications in suitable circumstances. The present study inferred that majority of population victimized by this dermatological scarring had at least mild to moderate impact on their quality of life. The overall interpretation of the study, in broad terms can be summarised as the scarring following acne having a significant deteriorative effect on the QoL of the subjects. Hence, it is of utmost importance to create optimum awareness of this pathology via public non profit camps and furthermore, initiate the treatment in the earliest phases to reduce the occurrence of scars. This study's findings also suggest that the quality of life worsens with increased severity of scarring. Therefore, individuals with acne should be treated promptly and effectively, in order to lessen the severity of their condition and to avoid acne scarring or reduce its severity.

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