



ORIGINAL ARTICLE

Study on Acne Scarring and Its Relationship between Severity and Treatment of Active Acne: An Observational Study

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Abstract

Background: Incorrectly selected treatment or the presence of severe acne vulgaris can lead to the formation of atrophic scars. **Objective:** The purpose of the present study was to evaluate the acne scarring and its relationship between severity and treatment of active acne. **Methodology:** This was cross-sectional observation study was performed in the EW VM Health Bangladesh Ltd., Dhaka for a period of 6 months. Evaluation of the types, sites, and severity of acne scars was done, and details of the severity and treatment of acne were recorded. Patients of all age-groups presenting for treatment of acne scars were included in the study. **Results:** This study shows maximum (40%) were age group 31-40 years. Face was involved in all the patients with acne vulgaris, which included the cheeks (91%), forehead (43%), jaw (51%), chin (27.0%), and nose (16.0%). The most common type of lesion predominantly observed was comedones (54.0%) followed by papules (53.0%), pustules (43.0%), nodules (29.0%), and cysts (3.0%). It was observed that 21.0% were mild acne, 27.0% were moderate acne and 52.0% severe acne. In grading system of acne scarring, 19.0% were macular acne scar, 14.0% were mild acne scar, 28.0% were moderate acne scar and 39.0% were severe acne scar. **Conclusion:** This study found majority of patients with active acne delay treatment, which leads to increased acne scarring. [*Journal of Current and Advance Medical Research, July 2022;9(2):69-73*]

Keywords: Acne, acne treatment; boxcar; ice pick; keloidal; post-acne scars; rolling

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Introduction

Acne is a common chronic inflammatory skin disease experienced by most adolescents and young adults. The pathogenesis of acne vulgaris is multifactorial. The four major identified factors that are involved in pathogenesis of active acne lesion formation and scarring are as follows: excess sebum production, follicular epidermal hyperkeratinization, the proinflammatory effects of propionibacterium acnes and other normal skin floras, and immunological reactions¹.

Although there are many topical and systemic agents that have been used in treatment of acne vulgaris, still many patients don't use these therapies and are considered as poor compliance, other patients have no time to use drugs or they don't like to use them or they have phobia from side effects¹. But acne vulgaris is one of the cosmetic major problems among the youth and often needs long term therapy because it might often end with complications like scarring²⁻³.

Lasers have been used in treatment of active acne vulgaris but there is controversy regarding their effectiveness as one study showed using Diode laser is an effective therapy in clearing lesions using three sessions, two weeks apart, and another study using Pulse Dye Laser (PDL) showed clearance of inflammatory acne vulgaris lesions using one session. While another study also using Diode laser didn't show significant improvement of facial acne¹. As lasers are expensive therapy, have controversial result and are not available in all centers, accordingly we are looking for a simple available and less costly mode of therapy than laser, which could be used in treatment of active acne vulgaris like using acids as peeling agents⁴.

Scarring is one of the most dreadful sequelae of acne for which patients frequently seek surgical treatment. It is associated with profound psychosocial disabilities, affecting the quality of life⁵. In patients with active acne, up to 95.0% of individuals show some degree of facial scarring⁶. Also delayed treatment and severity of acne are associated with a greater extent and severity of scarring. Acne scarring has been categorized into increased tissue formation including hypertrophic and keloid scars and more commonly loss of tissue including ice pick, rolling, and boxcar type scars⁷⁻⁸. Surgical treatment of acne scarring is individualized mainly according to the morphology of acne scars. This present study was undertaken to evaluate the

acne scarring and its relationship between severity and treatment of active acne.

Methodology

Study Settings and Population: This was cross-sectional observation study was performed in the EW VM Health Bangladesh Ltd., Dhaka for a period of 6 months. Patients of all age-groups presenting for treatment of acne scars were included in the study.

Study Procedure: Details of the patient along with the age of onset of active acne and their mean duration, site and type of lesions (photographs with examples of comedones, papules, pustules, and cysts were shown to patients to help them to recognize the features), family history of acne vulgaris, gap between the onset of active acne, and treatment taken and details of treatment taken for active acne were noted. A grading system devised by Lehmann et al⁹ for severity of acne was used. Any history of exposure to drug, sun exposure, seasonal variation, stress, and premenstrual flare were also obtained. Factors pointing toward hormonal imbalance, including obesity, hirsutism, and alopecia, were noted. Second section included morphology, number, and sites of post-acne scars. Grading of severity of acne scars was done using the qualitative global scarring grading system by Goodman and Baron¹⁰.

Statistical analysis: The collected data were checked and coded manually and then entered into computer. The numerical data obtained from the study were analyzed and significance of difference was estimated by using the statistical methods. Data were expressed in frequency, percentage, mean and standard deviation as applicable. Analysis of data was done by using computer based SPSS program (version 25.0). Probability less than 0.05 was considered as significant.

Ethical Consideration: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the Ethics Review Committee of Local Institute. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods.

Results

This study shows maximum (40.0%) were age group 31 to 40 years. The average age was 28.14 ± 7.47 years. Majority (63.0%) were male and 37% were female (Table 1).

Table 1: Socioeconomic Characteristics of the Study Subject (n=100)

Characteristics	Frequency	Percent
Age Group		
• 15 to 20 Years	21	21
• 21 to 30 Years	39	39
• 31 to 40 Years	40	40
Mean \pm SD	28.14 \pm 7.47	
Gender		
• Male	63	63
• Female	37	37

Face was involved in all the patients with acne vulgaris, which included the cheeks (91.0%), forehead (43.0%), jaw (51.0%), chin (27.0%), and nose (16.0%). This was followed by the involvement of the back (57.0%), chest (24.0%), and arms (11.0%) (Table 2).

Table 2: Distribution of Site of Acne (n=100)

Site	Frequency	Percent
Face	100	100
Cheek	91	91
Forehead	43	43
Jaw	51	51
Chin	27	27
Nose	16	16
Back	57	57
Chest	24	24
Arm	11	11

The most common type of lesion predominantly observed was comedones (54.0%) followed by papules (53.0%), pustules (43.0%), nodules (29.0%), and cysts (3.0%) (Table 3).

Table 3: Distribution of Type of Acne (n=100)

Type	Frequency	Percent
Comedones	54	54
Papule	53	53
Pustule	43	43
Nodule	29	29
Cyst	3	3

About 21% were mild acne, 27% were moderate acne and 52% severe acne (Table 4).

Table 4: Distribution of Severity of Acne (n=100)

Severity	Frequency	Percent
Mild	21	21
Moderate	27	27
Severe	52	52

Maximum (92.0%) were ice pick followed by rolling (84.0%), boxcar (52.0%) and hypertrophic/kleoidal scar (9%) (Table 5).

Table 5: Distribution of Type of Acne Scars (n=100)

Type of acne scars	Frequency	Percent
Ice pick scar	92	92
Rolling	84	84
Boxcar	52	52
Hypertrophic/Kleoidal scar	9	9

About 19% were macular acne scar, 14% were mild acne scar, 28% were moderate acne scar and 39% were severe acne scar (Table 6).

Table 6: Distribution of Severity of Acne Scar (n=100)

Severity	Frequency	Percent
Macular	19	19
Mild	14	14
Moderate	28	28
Severe	39	39

Discussion

Acne scarring is a common and persistent complication of acne vulgaris that affects a large proportion of the population. Despite its high prevalence, there is no single treatment modality that has been shown to be universally effective, posing a significant challenge for the treating physician¹⁰⁻¹¹. However, there are multiple methods for the treatment of acne scars available, each with both pros and cons. Selection of the appropriate treatment for each patient should depend on a number of factors such as: type of scars; efficacy; side effects; physician's expertise; and patient's expectations¹². This present study demonstrates the acne scarring and its relationship between severity and treatment of active acne. The study findings of

this research were discussed and compared with previously published relevant studies.

In this study shows males were comparatively more than females with male: female ration of 1.70:1. This may be because male patients had more severe acne vulgaris, which progressed to acne scarring as recorded by other research work^{8,13}. They reported males were comparatively more than females with male: female ration of 1.56:1. The mean age of presentation of patient with acne scars was 28.14 ± 7.47 years.

This study shows observed that acne on the face in majority of patients, followed by back, chest, and arm. Acne is a disorder of the pilosebaceous unit. The lesions are found in areas rich in this unit¹⁴. Similar to literature, also observed acne on the face in majority of patients, followed by back, chest, and arm. Acne is a polymorphic disease^{4,6-7,9}. The most common type of lesion in our study was comedones (54.0%). These findings consistent with other research work across the world⁸. These observations are in accordance with data as reported by Kilkenny et al¹³.

This study shows Lehman grading system for acne majority of patients who presented with acne scarring had a history of severe acne (52.0%). According to Lehman grading system for acne, Dipty et al⁸ observed that majority of patients who presented with acne scarring had a history of severe acne (54.0%). It was also observed that male patients had more severe acne vulgaris as compared to females ($P = 0.0001$), and thus more severe scarring.

According to various reports, early and effective treatment of acne vulgaris is the most appropriate way to prevent scarring¹⁵. In this study, 50 patients had a delay of 1 year before receiving treatment for their acne vulgaris, and 20 patients never received any treatment. Of 80 patients who had taken treatment, only 13 patients were given oral isotretinoin, 47 had received oral antibiotics, and all of them had received topical treatment. Also observed that of 20 patients who had never taken any treatment, 13 patients had developed severe grade of acne scarring and 7 patients had developed moderate grade of acne scarring. These findings consistent with other research work across the world⁸. Similar results were also reported by Chuah and Goh¹⁶. They observed post-acne scarring in 48.0% of their patients who had delayed their treatment for 1 year after the onset of their acne

vulgaris and in 12(12.0%) patients who had never received any treatment.

Post-inflammatory hyperpigmentation is a common complication of acne vulgaris in darker skins. This study observed it in 52% of our patients. Taylor et al¹⁷ and Yeung et al¹⁸ also reported similar incidence of post-acne hyperpigmentation in their study. Most common type of acne scars observed in this study were ice pick scars (92.0%) followed by rolling scars (84.0%), boxcar scars (52.0%), and keloidal scars (9.0%). Adityan and Thappa¹⁹ also reported ice pick scar as the most common type of acne scar in 65.6% patients. Keloidal scars were present on the mandibular region in four patients, and on upper back, shoulder, and chest in six patients, majority of which were males (9 patients). Also patients were more concerned for treatment of facial acne scarring than chest and back scars.

In this study shows grading of severity of acne scarring was done according to the Goodman and Baron qualitative grading system. Macular grade was observed in 19.0% patients, mild in 14 patients, moderate in 28 patients, and severe in 39 patients. Similar study Dipty et al⁸ reported macular grade was observed in 22 patients, mild in 12 patients, moderate in 29 patients, and severe in 37 patients. Chuah and Goh¹⁵ observed moderate grade (54.0%) of acne scarring in majority of their patients.

Macular grade was observed in 22 patients, mild in 12 patients, moderate in 29 patients, and severe in 37 patients. Chuah and Goh¹⁶ observed moderate grade (54.0%) of acne scarring in majority of their patients. Chronic inflammation in acne causes damage to dermal collagen, which leads to acne scarring. Literature suggests that more severe the inflammation more will be the scarring²⁰. In this study observed that severe acne scarring in 2 of 14 patients (14.2%) who had taken oral isotretinoin as compared to 9 of 25 patients (36.0%) who had taken oral antibiotic treatment.

A significant difference was observed in the severity of acne scarring after oral retinoid treatment as compared to that after oral antibiotics. Also literature suggests that early use of topical retinoids as part of acne treatment helps in significant reduction in chronic inflammation, thereby reducing the severity of acne scarring²¹. Similar study reported severe acne scarring in 1 of 11 patients (9.1%) who had taken oral isotretinoin as compared to 17 of 45 patients (37.8%) who had taken oral antibiotic treatment⁸.

This study observed that 52 patients with severe acne progressed to acne scarring, of which, 21(40.4%) had moderate grade of acne scarring and 31(59.6%) patients had severe grade. Similar study reported that 52 patients with severe acne progressed to acne scarring, of which, 22 had moderate grade of acne scarring and 32 patients had severe grade. Another study Layton et al⁶ also observed that there were significant correlations between the initial acne grade and the overall severity of scarring ($P < 0.01$).

This study brings out the profile of acne scarring and the correlation between severity of acne and delayed treatment with severity of acne scarring, thereby highlighting the need to increase public awareness through education programs on early treatment of acne to reduce the risk and severity of post-acne scarring.

Conclusion

Majority of patients with active acne delay treatment, which leads to increased acne scarring. Ice pick scars are the most common type of acne scars, and keloidal scars are more common in males. Early treatment of oral retinoids may help to reduce the severity of acne scarring. Public education is essential to urge patients to seek early and appropriate treatment of acne that can reduce the incidence and intensity of acne scarring and its psychosocial consequences.

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