

Effectiveness of Sequential Peeling as Mono-Therapy for Mild Acne Vulgaris

Sequential Peeling as Mono-Therapy for Mild Acne Vulgaris

Sabah Ibad¹, Sumeera Zulfiqar¹ and Anum Sharif²

ABSTRACT

Objective: Glycolic acid and salicylic acid peels frequently used to treat acne vulgaris. However rarely the two agents are applied as a sequential peel to treat acne vulgaris. The objective of the present study was to reveal the effectiveness of sequential peeling as mono-therapy to treat mild acne vulgaris.

Study design: A randomized control clinical trial study.

Place and Duration of Study: This study was conducted at the Dermatology Department of Combined Military Hospital Multan from July, 2020 to Dec, 2020 for a period of six months.

Methodology: 60 Patients with only mild acne vulgaris who fulfilled inclusion criteria were included in the study. The patients were divided into 3 groups. Group 1 underwent sequential peeling with only 70% Glycolic acid. Group 2 was treated with 30% Salicylic acid. The group 3 received sequential peeling with the combination of glycolic acid and salicylic acid. Acne grading was done by performing lesion count before and after the treatment. Follow up was done to record any worst outcome of the procedure.

Results: 60 patients divided into 3 groups, 20 participants each were included in the study. The course of disease duration ranges from few months to 10 years. 12(60%), 15(75%) & 14(70%) patients in group 1, group 02 and group 3 had skin type III respectively. While 8(40%), 5(25%) and 6(30%) participants had skin type IV in successive groups accordingly. There was a considerable reduction in lesion count after treatment in all 3 groups ($p < 0.05$). Regarding patient's satisfaction, the difference between the 3 groups regarding lesion count before and after treatment was not significant. There was also no significant difference in disease duration between 3 groups. However, there was a significant difference regarding patients satisfaction following treatment among 3 groups with $P=0.001$ for group 03 which is significantly higher than group 01 and 02 both with ($P > 0.05$).

Conclusion: It was concluded that sequential peeling is an effective treatment to be used as a monotherapy against mild "acne vulgaris". Moreover, "Glycolic acid" and "salicylic acid" might give improved results while being used in combination.

Keywords: Acne vulgaris, Chemical peels, Glycolic acid, Salicylic acid

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INTRODUCTION

Acne vulgaris is a well-known chronic inflammatory multifactorial disorder⁽¹⁾. It results in formation of pilosebaceous follicles⁽²⁾. It affects more than 85% of adults and persists frequently⁽³⁾. It is not a life-threatening condition but it is a major cause of physical and psychological stress⁽⁴⁾. It may be as well linked to post-inflammatory hyperpigmentation and scarring⁽⁵⁾.

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The understanding of pathophysiology provides main targets for treatment. The main elements involve in pathophysiology of Acne Vulgaris include follicular epidermal hyper proliferation, inflammation and increased sebum production by androgens⁽⁶⁾. In addition to this bacterial colonization of hair follicles being caused by Propionibacterium acnes can also be used as a potential target for developing treatment modalities⁽⁷⁾. Most frequent sites affected by acne vulgaris are face, chest and back. Severe inflammation & scarring that occurs as a consequence can lead to social stigma and impairs quality of life⁽⁸⁾.

The management of Acne Vulgaris depends upon the severity of the disease⁽⁹⁾. Mild cases are often treated with topical antibiotics, topical retinoid & benzoyl peroxide. In moderate acne oral antibiotics are prescribed in addition to topical ones⁽¹⁰⁾. Severe cases are dealt by using systemic approach with medications such as anti-androgens e.g. spironolactone & isotretinoin⁽¹¹⁾. Alongside traditional therapies, combination therapy including adjuvant use of phototherapy, lasers and chemical peels are being

investigated in acne research⁽¹²⁾. The chemical peeling is a simple, economic, safe and non-invasive procedure. There are no reports suggesting systemic toxicity following peeling procedure⁽¹³⁾. The agent particularly involved in chemical peeling is salicylic acid (SA). SA is 2-hydroxybenzoic acid or orthohydroxybenzoic acid. It can be derived from willow bark, wintergreen leaves and sweet birch⁽¹³⁾. It functions by softening the stratum corneum, the consequent loosening of the intracellular matrix and corneocyte connections causes skin shedding⁽¹⁴⁾. It also decreases inflammatory lesions by causing inhibition of arachidonic acid cascade. In this way it effects most of the pathogenic mechanisms underlying acne vulgaris⁽¹⁵⁾.

Another frequently used chemical peel is Glycolic acid (GA). Based on chemical composition "GA is a hydrophilic alpha hydroxyl acid (AHA) with desquamating properties capable of reducing cohesion and plugging of skin cells resulting in extrusion of inflammatory contents"⁽¹⁶⁾. The aim of the present study was to evaluate the efficacy of sequential peeling as a monotherapy to treat mild acne vulgaris.

MATERIALS AND METHODS

The randomized controlled clinical trial was comprised of 60 patients with mild acne vulgaris. The participants were recruited from the dermatology department of CMH Multan. The study was conducted after taking written approval from institutional Review Board and Ethical committee. Inclusion criteria were mild acne vulgaris with active lesions. The participant with history of no systemic or topical treatment and skin photo "types III and IV" were included in the study. The patients with severe acne vulgaris were excluded from the study. Other factors on the basis of which participants were excluded include pregnancy, breast feeding, steroid use, hormonal acne, allergic skin disorders, HSV and psoriasis.

Detailed history was taken from the selected participants. It included onset, duration, and any other dermal disorder. Participants were asked to provide details of any recent dermal procedure done including hair epilation & bleaching. The participants were examined dermatologically. The examination included site, type of acne lesion and total lesion count. Patients were randomly divided into 3 groups, 20 patients each. We used sequential peels one with GA only and SA only on two groups. The concentrations were reversed with SA 70% and GA 20% for the second group. The effects of both combinations were analyzed comparatively. Group 1 was treated with sequential peeling sessions with GA once every 2 weeks for 4 months. Group 2 was treated with SA once every 2 weeks for 4 months. While group 3 was treated with 70% GA for 3 minutes followed by 30% SA once every 2 weeks for 4 months. The participants' skin was cleaned with alcohol and acetone was used to degrease.

All safety precautions were followed during whole procedure of sequential peeling. Participants were advised to apply topical antibiotic cream following the day of treatment and to apply sunscreen daily. Participants were also instructed to use non soap cleansers and to avoid rubbing or scratching the treated skin. Follow up was done to record any worse outcome for example skin infections, erythema, blisters or edema.

Statistical analysis: The statistical analysis of the data was done using SPSS. The data was analyzed and presented in terms of mean \pm standard deviation and range. P-value <0.05 were considered statistically significant. "Chi-square test" or "Fisher's exact" test was used for comparing categorical data.

RESULTS

The study included 60 patients divided into 3 groups. Each group was consisting of 20 participants. The ages of patients were between 16 -31. The minimum & maximum course of disease duration ranges from few months to 10 years. 12(60%), 15(75%) & 14(70%) patients in group 1, group 02 and group 3 had skin type III respectively.

Table No.1: Demographic data and comparison between groups before and after treatment

Variables	Group 1 n=20	Group 2 n=20	Group 3 n=20
Age Median (range)	20(16- 31)	20(16-26)	18(18-24)
Mean \pm SD	21.27 \pm 3.41	20.67 \pm 2.02	18.93 \pm 3.12
Duration (years) Median (range)	4.66 (0.35 - 8)	2.73 (1 - 6)	4.13 (1 -10)
Mean \pm SD	3.94 \pm 3.15	3.12 \pm 2.13	4.91 \pm 4.04
Skin Type III	12 (60%)	15 (75%)	14 (70%)
Skin Type IV	8 (40%)	5 (25%)	6 (30%)
Lesion count (Before) Median (range) Mean \pm SD	16 (12 -40) 18.33 \pm 8.65	18 (12 - 36) 19 \pm 8.59	24 (10 - 42) 24.33 \pm 12.45
Lesion count (After) Median (range) Mean \pm SD	3 (2-7) 3.17 \pm 2.21	02 (0-8) 2.19 \pm 1.54	2 (0 -06) 1.91 \pm 1.58
Patient satisfaction Before Range Median	1-3 2	1-3 2	1-3 2
After Range Median	3-4 4	3-4 4	3-4 4

While 8(40%), 5(25%) and 6(30%) participants had skin type IV in successive groups accordingly. There was a significant reduction in lesion count after treatment in all 3 groups ($p < 0.05$). The lesion count

before treatment was 16, 18 and 24 in group 1, group 02 and group 03 respectively. Following treatment, the lesion count gets reduced to 3, 2 and 2 in group 1, 02 and 03 respectively. The patients' satisfaction rate was also increased following treatment. There was no statistically significant difference between the 3 groups regarding lesion count before and after treatment. There was also no significant difference in disease duration between 3 groups. The median of the disease duration for group 01, 02 and 03 was 4.66, 2.73 and 4.13 years respectively. However, there was a statistically significant difference regarding patients satisfaction following treatment among 3 groups with $P=0.001$ for group 03 which is significantly higher than group 01 and 02 both with ($P > 0.05$).

There was no adverse effect reported within 03 months following sequential peeling in any participant.

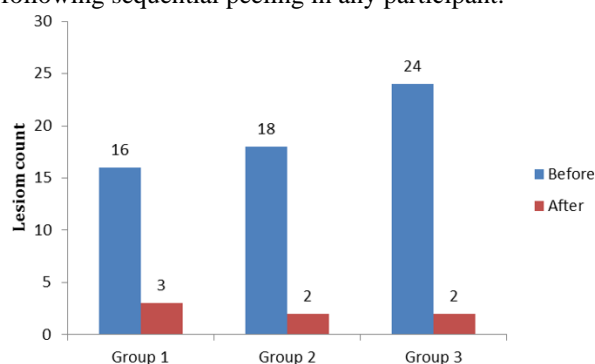


Figure No.1: Total lesion count in Group 1, Group 2 and Group 3 before and after treatment

DISCUSSION

Chemical peeling is a relatively economic and generally safe method for treatment⁽¹⁷⁾. It is used in treatment of some skin disorders where it refreshes and rejuvenates skin. The chemical peels are being used in routine clinical practice as a peel but less frequently used as a sequential peel⁽¹⁵⁾. Based on the penetrating ability or depth of action, Chemical peels are classified into superficial, medium, and deep peels⁽¹⁸⁾. The penetration of the peeling agent is correlated with clinical changes achieved. The greatest changes are achieved by peels at higher concentrations. However, the depth is also associated with the number of sessions⁽¹⁹⁾.

In the present study, the efficacy of sequential peeling was evaluated against mild acne using glycolic acid and salicylic acid. There was significant improvement in lesion count of all 3 groups. The rate at which the lesion counts in group 1 and 2 get decreased was almost similar. The participants in these groups were treated with GA or SA alone. However, there was increased reduction in lesion count in group 3 where participants received combination of GA and SA for sequential peeling for the same treatment duration. Although there was no statistically significant difference among 3

groups but the improvement rate was high in group 3 participants. In addition to that the patient's satisfaction rate was significantly high in group 3 as compared to group 1 & 2.

There are several studies that provide evidence on the effectiveness of sequential peeling for treatment of acne vulgaris⁽²⁰⁾. GA peels are available at concentrations ranging from 20% to 70%⁽²¹⁾. At increased concentration the intensity and penetrating ability of GA increases. According to the previous studies that utilizes GA at varying concentrations it was reported that GA is a potential agent for treatment of all types of acne. It induces rapid improvement and restores skin to normal⁽²²⁾. Hereby the results obtained in study group 1 were significant in terms of reducing lesion count before and after treatment with the 70% GA as peeling agent. According to the initial studies that used only SA as sequential peel it was reported that SA was proven to be an efficient peeling agent for minimizing both inflammatory and non-inflammatory lesions⁽²³⁾. SA is known for anti-inflammatory properties. Because of its lipophilic nature it can penetrate comedones and helps in preventing clogging of the pores⁽¹⁹⁾. 5 to 30% of the SA is considered to be safe for sequential peeling⁽²⁴⁾. Most of the previous studies are based on mild acne that can be treated with topical retinoid, antibiotics or benzoyl peroxide-containing products if inflammatory lesions are present. As inflammation becomes more widespread or intense, topical retinoid and oral antibiotics make sense. Only few studies focus on use of sequential peel as a treatment for mild acne vulgaris⁽²⁵⁾. Our study group 2 results are in accordance to the previous studies both in context of SA efficacy and treatment safety⁽¹⁾. Most of the studies till date determined % efficacy of different peeling agents while using only one agent at a time. In other instances, comparative analysis was performed among different chemical peels. In this study we treated group 3 with combination of SA and GA while applying both peeling agents in suitable concentrations. We get statistically significant results as per patients satisfaction in the group treated with combination of GA & SA. Moreover, the lesion count also decreases considerably. This reveals that while using sequential peeling as a mono therapy for treatment of acne vulgaris, it might be a good idea to use peeling agents in combination.

CONCLUSION

It was concluded that sequential peeling is an effective treatment to be used as a mono-therapy against mild acne vulgaris. Moreover, Glycolic acid and salicylic acid might give improved results while being used in combination.

Author's Contribution:

Concept & Design of Study: Sabah Ibad
Drafting: Sumeera Zulfiqar

Data Analysis: Anum Sharif
 Revisiting Critically: Sabah Ibad, Sumeera Zulfiquar
 Final Approval of version: Sabah Ibad

Conflict of Interest: The study has no conflict of interest to declare by any author.

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