

A COMPARATIVE STUDY TO KNOW THE EFFICACY OF 35% GLYCOLIC AND 30% SALICYLIC ACID PEELS IN GRADE 2 ACNE VULGARIS

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Abstract

Introduction : Acne vulgaris is one of the most prevalent skin disorders caused due to androgenic stimulation of sebaceous gland, abnormal follicular hyper keratinization, obstruction of pilo-sebaceous follicle.

Aims and objectives : To compare the efficacy and tolerability of 35% Glycolic acid and 30% Salicylic acid peel in the treatment of grade II Acne vulgaris patients.

Materials and methods : The patients were graded as per universally accepted grading system i.e. Global Acne Grading and randomly assigned in two groups (Group A & Group B), where one group received 35% glycolic acid peel & other received 30% salicylic acid peel.

Results : Both Glycolic acid and Salicylic acid peel were found to be safe and effective in the treatment of Grade II acne. Superior improvement was seen in Salicylic acid group. The overall reduction of Acne Vulgaris lesions in Group A was 67% and in Group B was 79%.

Conclusion : Alpha and Beta hydroxy acid peels, both are useful options as monotherapy for patients reluctant for oral therapy. These peels are considered to be very useful for those patients who are intolerant to oral medicaments.

Limitations : The limitations of our study was short follow-up period.

Keywords – Acne, glycolic acid peel, salicylic acid peel.

Introduction

The skin overlying the face is particularly important, as its appearance has a significant bearing on psychological well being of a person. Acne vulgaris is one of the most prevalent skin disorders and is the most common reason for visit to dermatologists.

Acne vulgaris is a disease of pilo-sebaceous unit. The pathogenesis involves androgenic stimulation of sebaceous gland, abnormal follicular hyper keratinization, obstruction of pilo-sebaceous follicle followed by its inflammation and the presence of propionibacterium acnes.

Comedones (blackheads especially) are the pathognomonic feature and the earliest microscopic lesions observed in acne vulgaris. Comedones develop due to the obstruction of follicular duct. The obstructed and infected follicle can rupture, leaking its content into the dermis, causing inflammatory lesions such as papules, pustules, nodules and cyst formation.

Some of these severe lesions can also lead to scarring and disfigurement of the face which can cause significant psychological morbidity in patients.

The type of acne being referred in this study is acne vulgaris, which is the commonest type of acne. Acne vulgaris typically starts at puberty, waxes and wanes through adolescent years and it peaks between 17-21 years. In about 90% of sufferers, acne vulgaris will spontaneously remit before 30 years of age. Maximum prevalence of acne vulgaris is in 12-24 years of age group which is around 85%. In 15-20% of these individuals; the acne vulgaris is moderate to severe. Acne severity is assessed by

the number and types of inflammatory lesions. There are several methods to grade acne vulgaris based on their severity. One such grading system, which is universally accepted, is global acne grading system.

Several topical and oral treatment options are available for the management of acne vulgaris. With time, the several modalities of treatment have evolved. Initially treatment was with oral medications, shifted to topical agents, and of late there has been significant advances and development of new techniques to improve outcomes.

As per the European Academy of Dermatology and Venereology recommendations, the use of chemical peels; mainly Glycolic acid (GA) and Salicylic acid(SA), in acne vulgaris is well supported. Both glycolic acid and salicylic acid peel are superficial peels.

Glycolic acid(GA) an alpha hydroxyl acid is a hydrophilic compound often used in chemical peels due to its desquamating properties. Glycolic acid peel concentration varies from 20%-70%. At concentration around 30-35%, GA peel induces epidermal exfoliation by decreasing corneocyte cohesion whereas at higher concentration GA peels are associated with more destructive changes due to increased epidermal enzyme activity resulting in epidermolysis. Given their low acidity, alpha hydroxy acid needs to be neutralised with alkaline solution such as sodium bicarbonate.

Salicylic acid(SA), a lipophilic beta hydroxyl acid, also reduces corneocyte cohesion and performs well on sebaceous area of the face. It has keratolytic property and can be used in various

concentrations, commonly 20-30%. Salicylic acid peel has anti-inflammatory effects which reduce post peel erythema as well as anaesthetic effect to reduce discomfort. Salicylic acid induces a white precipitate within 1 minute of application and does not require neutralization.

Given their comedolytic property both SA & GA have shown to substantially improve comedonal acne. Salicylic acid peel and glycolic acid peel shows improvement in both inflammatory and non-inflammatory acne. In inflammatory acne the overall improvement is based on total number of sessions of chemical peel. However, a transient flare of papule and pustule in first several weeks of treatment is a common occurrence.

There are several adverse effects of superficial peeling agents. The post-peel erythema may persist for the initial 5-7 days. This may be followed by post inflammatory hyperpigmentation. The affected area may get infected (bacterial, fungal, viral) and may even lead to permanent scarring. The most common site of such scars is the perioral and mandibular region.

Though many studies are available on the use of chemical peels which includes Glycolic acid and Salicylic acid peels. However, very few studies are available in the literature comparing various types of chemical peels.

Hence, this study was undertaken to evaluate and compare the therapeutic response of two most commonly used chemical peels i.e., 35% Glycolic acid and 30% Salicylic acid peel in grade II acne vulgaris patients.

Aims And Objectives

To compare the efficacy and tolerability of 35% Glycolic acid and 30% Salicylic acid peel in the treatment of grade II Acne vulgaris patients.

Materials And Methods

This study was carried out in the department of dermatology, venereology and leprosy at a tertiary care hospital. In the study 60 patients with clinical diagnosis of Grade II Acne vulgaris were included.

The grading was done as per universally accepted grading system i.e. Global Acne Grading.

Patients were informed about the nature of study and written consent was obtained before including them in the study.

Dermatological examination for acne included the site of involvement and total number of comedones, papules and pustules and nodules which were counted and graded. The patients who fulfill the inclusion criteria were divided randomly into two groups of 30 patients each.

Serial photography of patients was taken before commencement of therapy, before each session and after completion of therapy.

- Group A- 35% Glycolic acid peel.
- Group B -30% Salicylic acid peel.

The patients were asked to avoid use of cosmetics or any other home remedies. Pre and post peel, non-comedogenic sunscreens were prescribed.

Inclusion Criteria:

- 1) Untreated patients of either sex of 15-25 years of grade II Acne vulgaris.
- 2) Patients of grade II Acne vulgaris who have not taken treatment in past 3 months.
- 3) Patients with lesion limited to face only.
- 4) Patients who have not taken Isotretinoin in past 6 months.

Exclusion Criteria:

- 1) Patient who refuses consent
- 2) Pregnant and lactating women
- 3) Having systemic illness e.g. hypertension, diabetes or any other problem.
- 4) Acne patients other than grade II.

Method of Chemical Peeling:

Patients were asked to wash the face with soap and then degreasing with spirit was done. The chemical peels selected (either glycolic acid or salicylic acid) was applied over the face starting from the forehead, cheeks, chin, nose and upper lips. After three minutes they were asked to wash the face and slight massage with ice pack was done. Then sunscreen was applied and patients were advised to protect from sunlight by using sunscreen at day time. This procedure was repeated every two weeks for 3 months. During each visit any side effect attributed to the peel was recorded. The local tolerability of the peel was evaluated by recording the degree of irritation, erythema, dryness, burning and peeling.

Results

In this study the following observations were made. Among the 60 patients, 41 (67.6%) were male and 19 (32.4%) were females with male: female ratio of 2.09:1 and their age ranged from 15 to 25 years with a mean age of 19.5 years. (Table 1)

Table 1. Distribution of patient according to sex

| Sex | No. of cases | % |
|--------|--------------|-------|
| Male | 41 | 67.6% |
| Female | 19 | 32.4% |
| Total | 60 | 100% |

Table 2. Distribution of Patient According to Occupation

| Occupation | No. of cases | Percentage |
|----------------|--------------|------------|
| Student | 35 | 59% |
| Employee | 10 | 15% |
| Self-employed | 8 | 14% |
| Farmer | 7 | 12% |
| Total patients | 60 | 100% |

Table 3. Distribution of Patients of Acne Vulgaris According to the Aggravating Factors.

| Factors | No. of Cases | % |
|----------------------------|--------------|-------|
| High glyceemic diet (n=60) | 27 | 37.7% |
| Premenstrual flare(n=19) | 15 | 81.8% |
| Stress (n=60) | 25 | 41.1% |
| Smoking (n=60) | 18 | 30% |

In the present study, 35(59%) were students, 10 (15%) were employee, 8(14%) were self-employed and 7(12%) were farmers. None of the patients were employed in occupation involving substances that are acnegenic.(Table 2)Table 1,2,3In this study group as per the history obtained from patients, following precipitating factors were recorded.(Table 3)

Table 4. Distribution of patient according to treatment received

| Treatment Group | Male | Female |
|-----------------|------|--------|
| Group A | 20 | 10 |
| Group B | 21 | 9 |
| Total | 41 | 19 |

The distribution of patients in two groups, Group A, receiving 35% glycolic acid peel and Group B, receiving 30% salicylic acid peel.(Table 4)

Table 5. Observation of responses with Glycolic acid peels in Group A patients with Grade II Acne vulgaris

| No. of week | Average number of lesions | | | | | | | Average number of lesions resolved | Percentage reduction |
|---------------|---------------------------|--------|--------|--------|--------|---------|---------|------------------------------------|----------------------|
| | 0 Week | 2 Week | 4 Week | 6 Week | 8 Week | 10 Week | 12 Week | | |
| Comedones | 7.68 | 6.68 | 5.8 | 5.05 | 4.44 | 3.88 | 2.76 | 4.92 | 64% |
| Papules | 6.26 | 5.41 | 5.26 | 4.41 | 3.72 | 3.03 | 2.51 | 3.75 | 60% |
| Pustules | 5.62 | 4.54 | 3.68 | 2.99 | 2.85 | 2.26 | 1.74 | 3.88 | 69% |
| Nodules | 4.63 | 3.63 | 2.86 | 1.96 | 1.63 | 1.34 | 0.92 | 3.71 | 80% |
| Total lesions | 24.19 | 20.26 | 17.6 | 14.41 | 12.64 | 10.51 | 7.93 | 16.26 | 67% |

Table 6. Observation of responses with Salicylic acid peels in Group B patients with Grade II Acne vulgaris

| No. of week | Average number of lesions | | | | | | | Average number of lesions resolved | Percentage reduction |
|---------------|---------------------------|--------|--------|--------|--------|---------|---------|------------------------------------|----------------------|
| | 0 week | 2 week | 4 week | 6 week | 8 week | 10 week | 12 week | | |
| Comedones | 7.73 | 6.73 | 5.47 | 5.03 | 3.62 | 3.09 | 2.14 | 5.59 | 72% |
| Papules | 6.32 | 5.44 | 5.02 | 3.9 | 3.28 | 2.13 | 1.35 | 4.97 | 79% |
| Pustules | 5.76 | 4.69 | 3.51 | 3.1 | 2.08 | 1.36 | 1.21 | 4.55 | 79% |
| Nodules | 4.76 | 3.76 | 3.03 | 2.13 | 1.16 | 1.04 | 0.53 | 4.23 | 89% |
| Total lesions | 24.57 | 20.62 | 17.03 | 14.16 | 10.14 | 7.62 | 5.23 | 19.34 | 79% |

The therapeutic response in patients under Group A, who received 35% Glycolic acid peel were as follow:(Table 5, Figure 1)Table 4,5,6 Fig 1,2The therapeutic response of patients under Group B, who received 30% Salicylic acid peel were as follow:(Table 6, Figure 2)

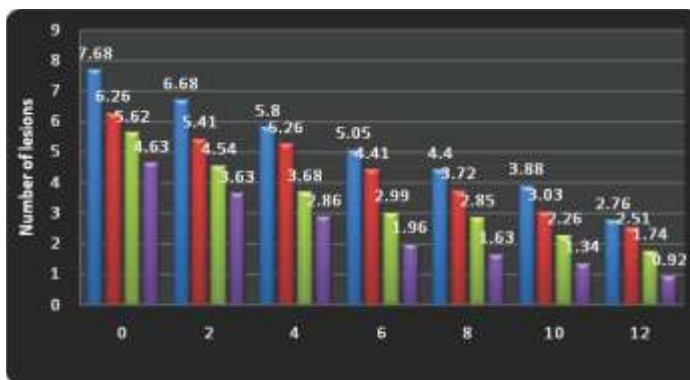


Figure 1 : Observation of responses with Glycolic acid peels in Group A patients with Grade II Acne vulgaris

These patients showed a rapid and sustained reduction in the inflammatory and non inflammatory lesions. After 6 weeks of

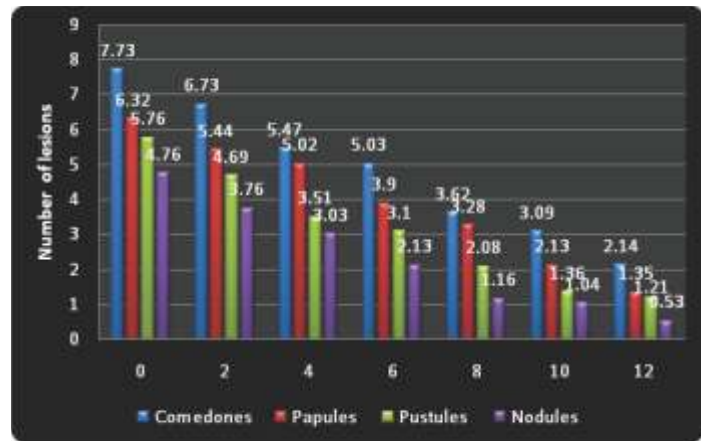


Figure 2 : Observation of responses with Salicylic acid peels in Group B patients with Grade II Acne vulgaris

treatment, there was a good reduction of lesions and no emergence of new lesions. At the end of 12 weeks 79% of lesions had subsided.Fig 3, 4a,b, 5a,bThe overall reduction of Acne Vulgaris lesions in Group A was 67% and in Group B was 79%. (Figure 3, Figure 4a and 4b, Figure 5a and 5b)

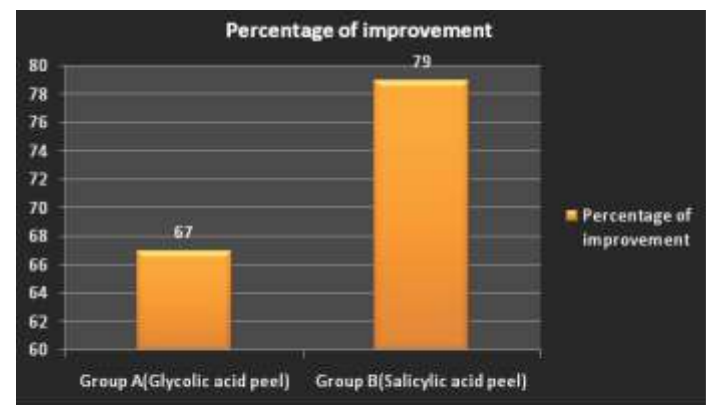


Figure 3 : Percentage reduction of Acne lesions in patients under Group A and Group B.

These peels were very well tolerated both in immediate and post peel period with fewer side effects.Erythema, burning, dryness, excessive peeling and hyper pigmentation were observed in few patients, more so in patients undergoing glycolic acid peel.However, these side effects were temporary and improved over subsequent visits.None of the patients discontinued treatment because of the side effects.

Discussion

The present study included 60 patients presenting to the Dermatology, Venereology & Leprosy OPD of National Institute of Medical Sciences & Research, Jaipur with clinical diagnosis of grade II acne vulgaris. These patients were examined and the finding were recorded on proforma and analysed.

The present study was conducted to compare the efficacy of 35% Glycolic acid and 30% Salicylic acid peel in the treatment of Grade II Acne vulgaris.

Acne vulgaris is commonly encountered disorder at dermatology clinics. It has a significant negative psychological impact. Acne frequently resolves to leave behind sequela in the form of scarring and pigmentation. Chemical peeling has shown to be an effective therapeutic option in the treatment of active acne lesions and post-inflammatory hyperpigmentation.

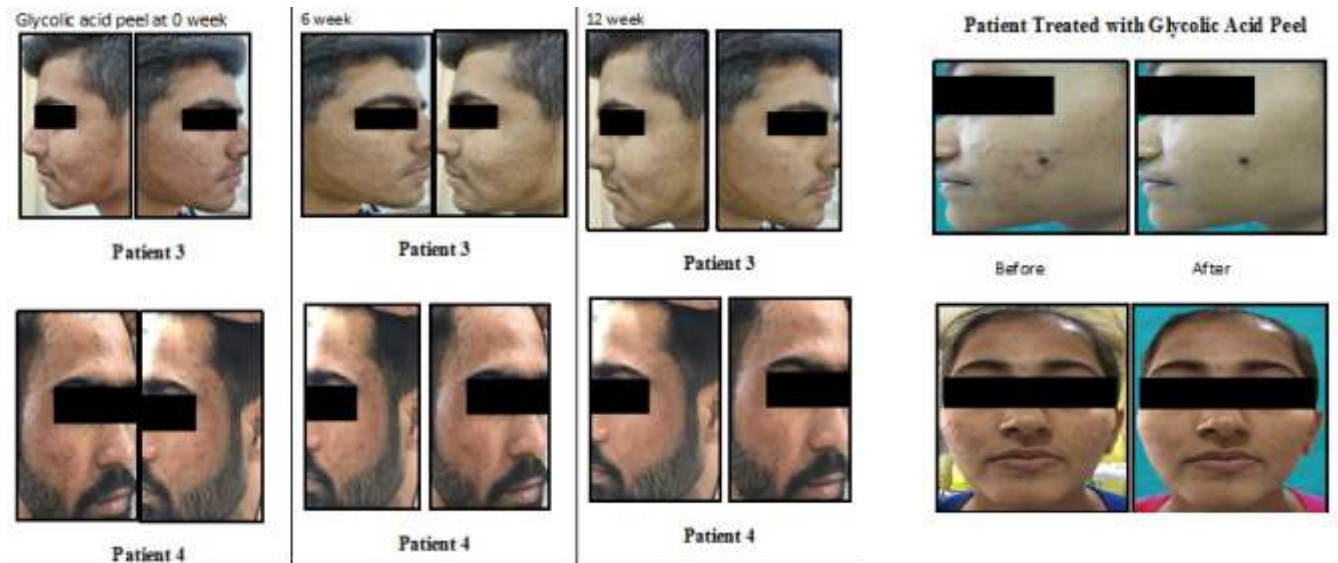


Figure 4a and 4b : 4a and 4b: Serial photographs showing improvement in patients treated with 35% glycolic acid.



Figure 5a and 5b : Serial photographs showing improvement in patients treated with 30% salicylic acid

Glycolic acid (GA) is an alpha hydroxy acid. In low concentration, it decreases corneocyte cohesion, epidermal thickness and corrects the abnormal keratinization whereas higher concentration causes epidermal separation and stimulation of dermal collagen. Repeated application of the peeling agent causes dermal thickening and improvement in acne scars. In this study, glycolic acid showed significant improvement in both inflammatory and non-inflammatory acne lesions at the end of 12 weeks. (9,10,11)

Salicylic acid is a beta hydroxy acid peel. It has a comedolytic effect and can penetrate the sebaceous glands because of its lipophilic nature, thus affecting follicular keratinization. It also decreases inflammatory lesion count by acting on the arachidonic acid cascade. In this study, salicylic acid peel group showed significant improvement in inflammatory acne lesions compared to the glycolic acid peel. (12)

In a study conducted by Skroza et al. females outnumbered males. This is in contrast to the present study where total number of males outnumbered females.

In present study mean age of onset in male was 18.5 years and for

females was 18 years. Similar finding was observed by Al-Ameer et al and Supreeti et al. The earlier onset of clinical acne in girls than boys is presumably related to their early onset of puberty.

Khunger et al and Kumar et al. in their study noted that chronic stress leads to increased androgen secretion, increased sebum production and hence decreases the immune status.

These studies correlate clinically with our present study where acne flared up in 41.1% cases in stressful condition.

In the present study, out of the 19 female patients, 15 (81.8%) had a flare of acne in the premenstrual period. Similar results observed by Cunliffe et al and Lauren et al in their study that acne symptoms worsened during menses. Premenstrual flare is possibly related to a premenstrual change in the hydration of the pilosebaceous epithelium.

Smith et al. and Adebamowo et al. showed positive association between high glycaemic diet and acne severity. In the present study, 27 patients gave the history of taking high glycaemic diet like chocolates, ice creams, and fried food and milk and milk products.

Since milk contains androgenic hormones and other bioactive molecules, moderation of milk intake may be useful as part of the management of teenage acne.

Among the smokers about 80% gave a history of exacerbation of acne severity on smoking.

Impaired vaso-reactivity, relative ascorbic acid deficiency, impaired collagen synthesis and wound healing in smokers may play some part in the underlying pathogenesis for the association between smoking and acne. Schafer et al. and Chuh et al. in their studies observed that smoking is likely to bear a positive association with acne.

In present study 30% Salicylic acid and 35% Glycolic acid peel were used for the treatment of grade II acne vulgaris patients. Both peels were safe and well tolerated with fewer side effects observed with glycolic acid.

Conclusion

Both Glycolic acid and Salicylic acid peel were found to be safe and effective in the treatment of Grade II acne, with slightly superior improvement in patients undergoing Salicylic acid peel. They were very well tolerated both in immediate and post peel period with fewer side effects.

Alpha and Beta hydroxy acid peels, both are useful options as monotherapy for patients reluctant for oral therapy. These peels are considered to be very useful for those patients who are intolerant to oral medicaments.

Limitations

The limitations of our study was short follow-up period.

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