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Original Research Article

A comparative study of 30% salicylic acid peel and 50% glycolic acid peel in mild to moderate acne vulgaris

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ABSTRACT

Introduction: Acne vulgaris is a common dermatological condition that significantly impacts patients' quality of life. Salicylic acid (SA) and glycolic acid (GA) are two common chemical peels used to treat mild to moderate acne. However, direct comparisons of their efficacy and safety are limited. With this background, we aimed to compare the effectiveness of Salicylic acid peel 30% and Glycolic acid peel 50% in patient with mild to moderate Acne vulgaris in our region with cultural variations and skin reactions to these treatments.

Materials and Methods: A randomized controlled trial was conducted involving 50 participants with mild to moderate acne. Participants were randomly assigned to receive either 30% SA peel or 50% GA peel at two-week intervals for a total of five sessions. Acne severity and numbers were assessed during each session. Treatment effectiveness and adverse effects were evaluated.

Results: Patients in both groups demonstrated significant reductions in acne at the end of the session. The SA group showed a more rapid reduction in inflammatory lesions and numbers in acne. On comparing SA and GA we found statistical significance at week 6 (0.0327) and week 8 (0.0450). Adverse effects such as burning, itching, redness and scaling were noted in both groups.

Conclusion: Both 30% salicylic acid and 50% glycolic acid peels are effective and safe for treating mild to moderate acne vulgaris. The choice of peel should be guided by the predominant clinical presentation and individual patient needs, with SA being preferable for active inflammatory lesions.

1. Introduction

Acne vulgaris is a common dermatological condition affecting the pilosebaceous units, predominantly occurring during adolescence but often persisting into adulthood. It is characterised by comedones, papules, pustules, and occasionally nodules or cysts, can have a substantial influence on a person's self-esteem and quality of life.[1,2] Acne vulgaris is widespread among teenagers and young adults. Its prevalence rates are believed to range from 35% to more than 90% among adolescents.[3]

Some of the key mechanisms involved in acne development include disturbed sebaceous gland activity associated with hyper seborrhoea and changes in sebum fatty acid composition, dysregulation of the hormone microenvironment, interaction with neuropeptides, follicular hyperkeratinization, inflammation induction, and innate and adaptive immunity dysfunction.[4] Acne vulgaris is difficult to treat because of its complex aetiology. Topical retinoids, systemic and topical antibiotics, benzoyl peroxide, azelaic acid, and systemic isotretinoin are among the current treatments. Topical dapsone, taurine

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bromamine, resveratrol, chemical peels, optical therapies, and complementary and alternative medicine are examples of adjunctive and/or developing techniques.[5]

Chemical peels are becoming more and more acknowledged as a minimally invasive, successful acne treatment option, especially for mild to moderate cases. These substances target important pathogenic variables such as follicular clogging, excess sebum, and inflammatory processes by causing a regulated chemical exfoliation of the epidermis. Because of their proven safety and effectiveness profiles, salicylic acid (SA) and glycolic acid (GA) are the most commonly utilised chemical peels. Salicylic acid is lipid-soluble, it can efficiently enter sebaceous follicles. It works very well for inflammatory and comedonal acne because of its keratolytic, comedolytic, and anti-inflammatory properties. The main mechanisms of action of water-soluble glycolic acid include the disruption of corneocyte cohesiveness, the enhancement of dermal remodelling, and the promotion of epidermal exfoliation.[6,7] With this background we aimed to compare the effectiveness of Salicylic acid peel 30% and Glycolic acid peel 50% peels in patient with mild to moderate Acne vulgaris in our region with cultural variations and skin reactions to these treatments.

2. Materials and Methods

A randomized controlled trial was conducted among 50 patients with Acne vulgaris presenting to Dermatology OPD at a Tertiary care hospital, in Tamil Nadu. With reference to the article Shah et al in Mumbai, India the prevalence of acne is 0.74%.[8] The estimated sample size to compare the two groups(50% Glycolic acid, 30% salicylic acid) was calculated to be 50, 25 in each group with confidence interval of 95% and absolute precision d = 3, using the formula 4pq/d2. Patients aged between 18 to 40 years with mild to moderate acne vulgaris and both genders were included in the study. Patients with active infections, known hypersensitivity, and pregnant & lactating females were excluded from the study.[9] Patients were divided into two groups with 25 each. Glycolic acid 50% peel was applied on the lesions for Group A patients and observed for 2-3 minutes until endpoint -erythema was observed and neutralized with 10% sodium bicarbonate. Salicylic acid 30% peel was applied on the lesion by the dermatologist and observed for 3-5 minutes until endpoint pseudo-frost was observed and washed with water for Group B patients. Subjects in Group A & B applied sunscreen regularly and the procedure was repeated every two weeks. Under supervision for a maximum of five sessions. The Global Acne Severity Score assesses acne severity by considering lesion counts and their locations. Location factors are assigned as follows: 2 for the forehead, right cheek, and left cheek each; 1 for the nose and chin each; and 3 for the chest and upper back. Lesion types are rated on a scale where no lesions = 0, comedones = 1, papules = 2, pustules = 3, and nodules = 4. The total score is determined by multiplying the lesion count in each area by its location factor and summing the results. Severity levels are categorized as 0 (none), 1–18 (mild), 19–30 (moderate), 31–38 (severe), and over 39 (very severe). Serial Clinical photographs & acne severity scoring system were taken with the subject's consent to observe the improvement seen in acne vulgaris after the peel.

3. Results

The demographic characteristics of patients are shown in Table 1. The mean & SD of age among the patients with Glycolic acid 50% and Salicylic acid 30% are 22.4 ± 2.8 and 23.1 ± 3.7 years. In both the groups female participants were more than male participants.

The Table 2 shows the mean & SD of comedones, papules, and pustules (Grade I & II) numbers from the beginning to the end of the treatment. The initial numbers were almost equal in both the groups which are 27.6 ± 41.5 (Glycolic acid 50%) and 25.6 ± 19.2 (Salicylic acid 30%). There was a significant reduction in the number of comedones, papules, and pustules from 4^{th} week in both Group A and Group B. In the 8^{th} week, the mean & SD of Group A and Group B are 20.9 ± 21.6 and 11.1 ± 10. At the end of the treatment patients who used Salicylic acid 30% had better outcome than the patients who used Glycolic acid 50%. On comparing both the groups we found statistically significant at week 6 (0.0327) and week 8 (0.0450).

On comparing complications in Group A and Group B, the patients in both groups had burning, itching, redness, and scaling. Patients who used Salicylic acid 30% had significantly decreased the acne lesions and had skin whitening effects.

4. Discussion

In this study the number of comedones, papules and pustules were statistically significantly reduced during treatment in both the group of patients. In both groups, the longer the peeling times, the more the number of lesions was reduced. Facial sebum secretion has been reported to be significantly reduced after peels containing 50% Glycolic acid and 30% salicylic acid, which contribute to the effectiveness of these agents in acne improvement. Among this patients who used 30% salicylic acid had better outcomes.

A similar comparative study by Pavithra S et al was done with 70% GA peel (group 1) and 30% SA peel (group 2) with 30 patients in each group. at the initial phase, the mean & SD of groups 1 & 2 are 26.30 ± 5.91 and 25.73 ± 5.11 whereas in our study which are 27.6 ± 41.5 (Glycolic acid 50%) and 25.6 ± 19.2 (Salicylic acid 30%) which is almost same. In both the studies the mean acne lesional count of both groups was reduced and patients who used salicylic acid had better outcomes and they were

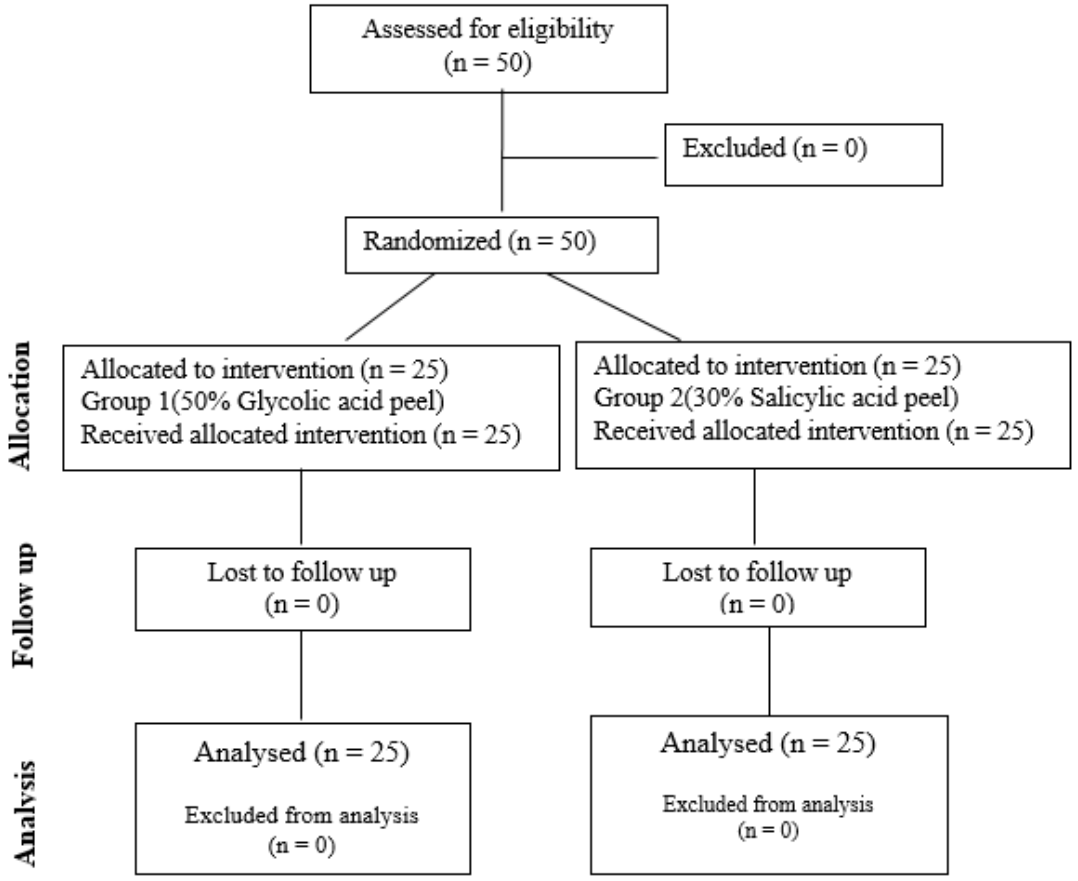

Figure 1: Consort flowchart of Randomized control trial

Table 1: Demographic characteristics of patients

Variables		Group AGlycolic acid 50% (n = 25)	Group BSalicylic acid 30% (n = 25)
Age (in years)		22.4 ± 2.8	23.1 ± 3.7
Gender	Male	7	6
	Female	18	19

Table 2: Comparison of Glycolic acid 50% vs Salicylic acid 30% on Acne vulgaris

Session	Group AGlycolic acid 50% (n = 25)	Group BSalicylic acid 30% (n = 25)	p-value
(Baseline)	27.6 ± 41.5	25.6 ± 19.2	0.3300
(Week 2)	25.6 ± 28.6	19.7 ± 16.1	0.3732
(Week 4)	23.3 ± 24.8	15.3 ± 11.6	0.2073
(Week 6)	22.9 ± 19.1	13.2 ± 11.2	**0.0327***
(Week 8)	20.9 ± 21.6	11.1 ± 10	**0.0450***

*p=<0.05 considered as significant

Table 3: Complications glycolic acid 50% vs Salicylic acid 30% on acne vulgaris

Complications	Group AGlycolic acid 50% (n = 25)	Group BSalicylic acid 30% (n = 25)
Burning	8	3
Itching	4	9
Redness	3	5
Scaling	4	4
No complications	6	4

found to be significant at 6^{th} & 8^{th} week sessions.[10] Garg VK et al conducted a similar study and found both Glycolic Acid Peels and Salicylic–Mandelic Acid Peels were effective in active Acne Vulgaris. Salicylic–Mandelic Acid Peels had a higher efficacy for most active acne lesions and hyperpigmentation which is consistent with our study findings. In the same previous study, side effects were also lesser with Salicylic–Mandelic acid whereas in our study we found fewer complications among the patients who used Glycolic acid.[11]

Manjhi M et al did a study with 50 % Glycolic Acid Peel and 30 % Salicylic Acid Peel in Mild to Moderate Acne. At 3^{rd} follow-up, the mean & SD of the number of acnes with Glycolic Acid and 30 % Salicylic Acid are 5.50 ± 3.91 and 2.20 ± 2.63 which showed 30 % Salicylic Acid is better than Glycolic Acid which is consistent with our study findings.[12]

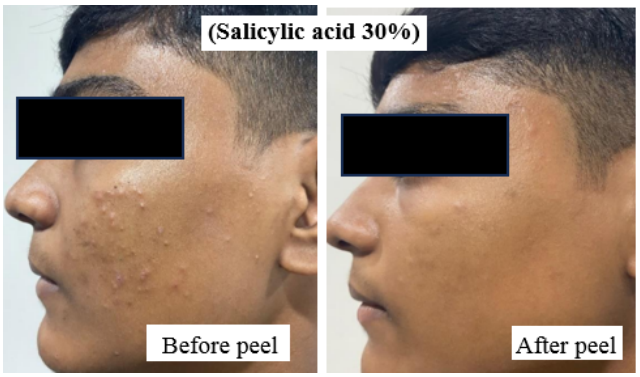

Figure 2: Standard photography

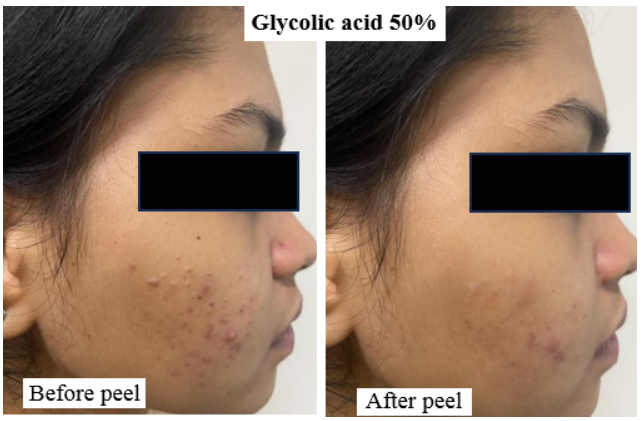

Figure 3: Standard photography

Other contrary studies by Sarkar R et al, Sharma P et al and Mohamed RH et al showed both SA and GA peels showed significant improvements in reducing acne lesions, but their mechanisms of action differ. Salicylic acid, a beta-hydroxy acid (BHA), is lipid-soluble and penetrates sebaceous follicles effectively. This makes it particularly suitable for targeting comedones and inflammatory lesions. Glycolic acid, an alpha-hydroxy acid (AHA), promotes epidermal exfoliation, enhances collagen synthesis, and improves post-inflammatory hyperpigmentation.[13–15]

5. Conclusion

This comparative study of 30% salicylic acid peel and 50% glycolic acid peel in mild to moderate acne vulgaris demonstrates that both chemical peeling agents are effective in treating acne, hyperpigmentation and scarring, enhancing skin texture and minimizing superficial scars with good compliance. While both treatments showed overall improvements in acne grading, salicylic acid peels had significantly reduced numbers of acne lesions and improved post acne pigmentation by its anti inflammatory and skin whitening effects. The patient's skin type, the severity of their acne, and their treatment objectives should all be taken into account when choosing between the two medications. To more thoroughly assess the long-term effectiveness and safety profiles of various peeling agents, further extensive research with bigger sample sizes including diverse demographics to assess different age groups, skin types and ethnicities are advised.

6. Source of Funding

None.

7. Conflict of Interest

None.

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