Original Article

Comparative Efficacy of Glycolic Acid VS Salicylic Acid Peel in Acne Vulgaris

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ABSTRACT

Objective: To compare the efficacy and safety of glycolic acid versus salicylic acid chemical peels in patients with mild to moderate acne vulgaris.

Study Design: A prospective randomized comparative study.

Place and Duration of Study: This study was conducted at the Department of Dermatology, Lady Reading Hospital, Peshawar, from June 2023 to May 2024.

Methods: A total of 120 patients with mild to moderate acne vulgaris were enrolled and randomly divided into two equal groups. Group A received glycolic acid peel, while Group B received salicylic acid peel. Six peeling sessions were performed at two-week intervals. Total lesion count and Global Acne Grading System score were recorded at baseline and follow-up visits. Treatment response and adverse effects were also assessed.

Results: Both groups showed significant reduction in total lesion count and acne severity scores by week 12. Mean lesion count decreased from 29.4 ± 6.5 to 8.5 ± 3.9 in the glycolic acid group and from 30.1 ± 6.2 to 6.7 ± 3.5 in the salicylic acid group. Mean percentage reduction was higher with salicylic acid than glycolic acid. Excellent response was observed in 60.0% patients in the salicylic acid group and 46.7% in the glycolic acid group. Adverse effects were mild and transient.

Conclusion: Both peels were effective and safe, but salicylic acid showed faster and slightly superior clinical improvement in mild to moderate acne vulgaris.

Key Words: Acne vulgaris; Glycolic acid; Salicylic acid; Chemical peel; Acne severity; Dermatology

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INTRODUCTION

Acne vulgaris is a persistent inflammatory disease of the pilosebaceous unit that presents with comedones, papules, pustules, nodules, and potential scarring, and is mostly common to adolescents and young adults. It occurs in up to 80-90 percent of people at some point in life and has major psychosocial as well as cosmetic consequences[1]. The mechanism of pathogenesis is a complex of interconnected causes, such as follicular hyperkeratinization, sebum hyperproduction, colonization with Cutibacterium acnes, and inflammation[2]. Although several topical and systemic treatment options are available, prompt and lasting improvement is a challenge to therapy. Chemical peeling has come in as a useful adjunctive modality in the treatment of acne.

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It is characterized by the use of chemical agents provoking controlled epidermal exfoliation and the following regeneration that enhance the skin texture and decrease the number of lesions[3,4]. Superficial chemical peels, especially the alpha-hydroxy acids (AHAs) like glycolic acid and the beta-hydroxy acids (BHAs) like salicylic acid are very popular because of their effectiveness and good safety profile.

Glycolic acid is a widely used AHA that is made out of sugarcane and has the effect of reducing cohesion of corneocytes, epidermolysis and dermal remodeling[5]. It helps in desquamation and enhances post-inflammatory hyperpigmentation and is especially effective in acne and acne sequelae. Salicylic acid, conversely, is a lipophilic BHA that enters into the sebaceous follicles and has comedolytic anti-inflammatory, and antimicrobial effects, thus being particularly useful in oily and acne-prone skin[6].

There is recent evidence that chemical peels can have an important effect in acne lesions and skin quality in combination with traditional therapy[7]. A recent meta-analysis has also shown that superficial chemical peels, such as salicylic acid-based preparations, are one of the effective alternatives to manage mild-to-moderate acne[8]. Moreover, comparative and combination studies have also revealed that both glycolic acid and salicylic acid peels can provide clinical improvement, but there are differences in their mechanisms, depth of penetration, and tolerability profiles[9].

While chemical peels are widely used, there is considerable variability in clinical results and little agreement on the superiority of one peeling agent over another. Thus, it is necessary to compare the glycolic acid and salicylic acid peels to determine their efficacy, safety and acceptability.

This research will evaluate the effectiveness of glycolic versus salicylic acid chemical peels in the management of acne vulgaris, and therefore guide the development of evidence-based therapy for acne.

METHODS

This prospective, comparative clinical study was conducted in the Department of Dermatology, Lady Reading Hospital, Peshawar, from June 2023 to May 2024. A total of 120 patients with mild to moderate acne vulgaris presenting to the outpatient department were evaluated. Patients of both sexes, between 15 and 35 years of age, with at least three months of facial acne vulgaris, were included. Patients with nodulocystic acne, active facial infection, known allergy to peeling agents, history of keloid formation, pregnancy or breastfeeding, systemic retinoids used in the last six months, the use of topical anti-acne medication or chemical peels in the last four weeks, and those who refused to comply with follow-up were excluded from the study.

The sample size calculation was based on reported clinical efficacy of glycolic acid and salicylic acid peels in treating mild to moderate acne vulgaris with a 95% level of significance, 80% power and an estimated 20% difference in the response to treatment between the two groups. A sample size of 54 patients in each group was calculated; to allow for potential drop-outs, 60 patients were selected in each group, totalling 120 patients.

Following informed written consent, subjects were equally divided into two groups by computer-generated random number sequence. Group "A" (n=60) was treated with glycolic acid peel, and group "B" (n=60) with salicylic acid peel. Demographic data, duration of acne, skin type, acne severity and total lesion count were assessed on a proforma before starting the procedure. The Global Acne Grading System was used to score acne severity and the number of facial lesions were counted as comedones, papules, pustules and nodules.

The face was cleaned and degreased prior to each peel. In Group A, glycolic acid peel was applied in a fixed concentration depending on tolerance (starting with 35% and increasing gradually if needed). In Group B, salicylic acid peel was applied in a concentration of 20% to 30% according to tolerance and effectiveness. The peel was applied evenly to the affected areas on the face, except the periorbital and mucosal area. The peel was left on for a brief period of time during the first treatment and then prolonged in subsequent treatments based on erythema, burning, frosting, and tolerance. Glycolic acid peel was neutralized with sodium bicarbonate solution but salicylic acid peel was left to self-neutralize and was then washed off. Bland moisturizer and sunscreen were applied after the peel.

The patients were treated with six peeling sessions, two weeks apart. Patients were instructed to avoid prolonged sun exposure, scrubbing, waxing, bleaching products and unsupervised topical acne treatment during the period of study. Non-comedogenic moisturizer and sunscreen were recommended during the treatment period. The subjects were assessed at baseline and weeks 4, 8 and 12. The primary outcome was the percentage change in the total number of acne lesions between the baseline and week 12. Secondary outcomes were reduction in Global Acne Grading System score, inflammatory and non-inflammatory lesion count, patient satisfaction, and rate of adverse effects (erythema, burning, dryness, peeling, post-inflammatory hyperpigmentation, acne flare).

SPSS version 26.0 was used for data analysis. Continuous variables like age, acne duration, numbers of lesions, and Global Acne Grading System score were represented as mean ± standard deviation. Categorical variables (gender, skin type, response to treatment, and adverse effects) were presented as frequency and percentage. Paired t-test was used for within-group comparison (pretreatment vs. post-treatment) and independent sample t-test was used for between-group analysis. Categorial variables were compared using chi-square test. P-value ≤ 0.05 was considered statistically significant.

RESULTS

There was no significant difference between the two groups in the baseline demographic parameters or severity of acne, implying homogeneity of the study groups. The data are presented in Table-1.

Table No. 1: Baseline Characteristics

Variable	Group A (n=60)	Group B (n=60)	p-value
Age (years, mean ± SD)	22.6 ± 3.8	23.1 ± 3.5	0.48
Gender (Male/Female)	25 / 35	27 / 33	0.71
Duration of Acne (months)	14.2 ± 5.1	13.8 ± 4.7	0.62
Baseline TLC (mean ± SD)	29.4 ± 6.5	30.1 ± 6.2	0.54
Baseline GAGS Score	23.8 ± 4.2	24.1 ± 4.0	0.66

Both groups were statistically comparable at baseline ($p > 0.05$).

There was a gradual decrease in the total lesion count over time in both groups. Although both groups showed a reduction, salicylic acid group showed a faster response, especially in the initial visits. Table-2

Table No. 2: Reduction in Total Lesion Count (TLC)

Time Point	Group A (mean ± SD)	Group B (mean ± SD)	p-value
Baseline	29.4 ± 6.5	30.1 ± 6.2	—
Week 4	21.2 ± 5.8	18.4 ± 5.3	0.03
Week 8	13.6 ± 4.7	10.9 ± 4.2	0.02
Week 12	8.5 ± 3.9	6.7 ± 3.5	0.07

Within treatment groups, both treatments demonstrated significant reduction ($p < 0.001$) and between group comparison demonstrated early and superior efficacy of salicylic acid.

At the end of the study, both groups showed marked percentage reduction, with a slightly greater mean reduction with salicylic acid. Table-3

Table No. 3: Percentage Reduction in Lesion Count at Week 12

Group	Mean % Reduction	p-value
Glycolic Acid	71.1% ± 9.3	
Salicylic Acid	77.8% ± 8.7	0.01

Similarly, the acne severity scores were reduced in both groups, although slightly more in the salicylic acid group. Table-4

Table No. 4: Change in GAGS Score

Time Point	Glycolic Acid	Salicylic Acid	p-value
Baseline	23.8 ± 4.2	24.1 ± 4.0	—
Week 12	9.2 ± 3.1	7.6 ± 2.8	0.02

In terms of response levels, more patients in the salicylic acid group showed excellent response than those in the glycolic acid group. Table-5

Table No. 5: Treatment Response at Week 12

Response Category	Glycolic Acid (n=60)	Salicylic Acid (n=60)
Excellent (>75%)	28 (46.7%)	36 (60.0%)
Good (50–75%)	22 (36.7%)	18 (30.0%)
Moderate (25–50%)	10 (16.6%)	6 (10.0%)
Poor (<25%)	0	0

The products were well tolerated, with mild, transient side effects in some patients. Slightly more erythema and irritation were reported with glycolic acid. Table-6

Table No. 6: Adverse Effects

Side Effect	Group A	Group B
Erythema	11 (18.3%)	8 (13.3%)
Burning Sensation	13 (21.7%)	10 (16.7%)
Peeling	18 (30.0%)	15 (25.0%)
Post-inflammatory Hyperpigmentation	4 (6.7%)	3 (5.0%)

DISCUSSION

In this study, both glycolic acid and salicylic acid peels resulted in significant improvement in mild to moderate acne vulgaris; however, salicylic acid resulted in a faster and slightly better improvement in total lesion count and acne severity index (GAGS). This is physiologically justifiable, as salicylic acid is lipophilic and can better penetrate the pilosebaceous unit to exert comedolytic, keratolytic and anti-inflammatory effects. This is why we found the salicylic acid group improved earlier, at weeks 4 and 8.

Our results are in agreement with Manjhi et al. who used 35% glycolic acid and 30% salicylic acid in 120 patients and found better response with the latter in mild to moderate acne[10]. Their groups were comparable at baseline, similar to our study, and supports the conclusion that the response was due to the peeling agent. Garg et al also found superior improvement with 30% salicylic acid compared with 70% glycolic acid in active acne, supporting our finding that salicylic acid may be a better choice for active inflammatory acne[11].

Our findings also support Bhate et al, who reported that 70% glycolic acid and 30% salicylic acid were effective, but salicylic acid had a better clinical response in patients with mild to moderate acne[12]. Williams et al, also found good results with 30% salicylic acid and 50% glycolic acid and salicylic acid resulted in a quicker improvement of inflammatory lesions during early visits[13]. This is similar to our findings, where the effect was more evident in early follow-up visits and less evident at week 12.

The explanation of the early efficacy of salicylic acid is probably its oil-soluble nature and the ability to penetrate follicles. Acne is based on follicular occlusion, sebum retention and inflammation; thus, a drug that penetrates the sebaceous follicle can exert a more direct action on the site of inflammation. By contrast, glycolic acid is water-soluble and acts primarily via epidermal exfoliation, decreased corneocyte cohesion and improved skin texture. This accounts for why glycolic acid still had good improvement in acne, but more delayed improvement in inflammatory lesions.

Our findings differ slightly from studies which report similar efficacy of glycolic acid and salicylic acid peels. Almeman et al, using a split-face design, found improvement with both acids[14]. This may be explained by the split-face design, small sample size, short duration of follow-up, different concentrations, and low variability. In our parallel-group study, the individual factors including skin type, sebum production, sunscreen compliance and duration of acne may have contributed to the response.

Both groups had good safety profiles in our study. The most common side effects were mild erythema, burning, peeling and dryness, which were treated conservatively. This is in line with Li et al, who found superficial chemical peels to be safe if carefully chosen and monitored[15]. The marginally higher irritation in the glycolic acid group might be due to lower pH-dependent penetration into the epidermis, requiring

neutralization, while salicylic acid neutralises itself after crystallisation.

The rare incidence of post-inflammatory hyper-pigmentation in both groups is significant, as most of our Pakistani patients have Fitzpatrick skin types IV-V, for whom pigmentary complications are an important consideration. The recent focus on post-inflammatory hyperpigmentation in acne supports cautious use of superficial peels, e.g. glycolic acid and salicylic acid, in the right patients, particularly with photoprotection[16,17]. This may account for the low frequency of pigmentary complications in our study.

The results of our study must also be considered in the context of current acne guidelines. The 2024 American Academy of Dermatology guidelines place high value on evidence-based drug therapy as the cornerstone for acne treatment and view procedures like peels as adjunct to an acne treatment plan[18]. Therefore, the practical implication of our study is not that the salicylic acid peel should be used instead of the conventional acnes therapy, but rather that the salicylic acid peel can be a choice in patients with oily skin, comedonal acne, and active inflammatory lesions, whereas the glycolic acid one can be applied where post-acne pigmentation and texture irregularity are most evident.

In summary, the findings support the conclusion that both glycolic acid and salicylic acid peels are effective and well-tolerated in mild-to-moderate acne vulgaris, with quicker improvement from salicylic acid peel. The variability in studies is largely due to variations in the concentration of peels, number of peel sessions, severity of acne, skin phototypes, scoring systems used and whether peels were applied alone or in conjunction with topical treatment.

CONCLUSION

Glycolic acid and salicylic acid chemical peels were both effective and safe in decreasing the number of acnes lesions and the severity of acne in patients with mild to moderate acne vulgaris, but salicylic acid had a faster onset of action, higher percentage reduction of the total number lesions, and a higher proportion of excellent clinical response. Glycolic acid also showed a considerable improvement and could be a viable alternative especially in patients with post-acnes textural and pigmentary issues. Thus, salicylic acid could be the choice in cases of active inflammatory acne and both peels can be used as a supportive treatment in the right patients.

Author's Contribution:

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Final Approval of version:	All the above authors
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REFERENCES

1. Reynolds RV, Yeung H, Cheng CE, Cook-Bolden F, Desai SR, Druby K, et al. Guidelines of care for the management of acne vulgaris. J Am Acad Dermatol 2024;90(5):1006.e1-1006.e30. doi:10.1016/j.jaad.2023.12.017.
2. Thiboutot D, Dréno B, Abanmi A, Alexis AF, Araviiskaia E, Barona Cabal MI, et al. Practical management of acne for clinicians: an international consensus from the Global Alliance to Improve Outcomes in Acne. J Am Acad Dermatol 2018;78(2 Suppl 1):S1-S23.e1. doi:10.1016/j.jaad.2017.09.078.
3. Khan FN, Saeed W, Qurat-ul-Ain, Mansoor M, Niazi N, Imtiaz A. Comparison of the outcome of 35% glycolic acid and 30% salicylic acid peels in treatment of patients with acne vulgaris. Pak J Med Health Sci 2022;16(4):150. doi:10.53350/pjmhs22164150.
4. Aftab K, Iftikhar N, Hussain M, Zainab Z, Mumtaz M, Obaid S. Salicylic acid versus glycolic acid peel in active acne. Pak Armed Forces Med J 2022;72(3):896-899. doi:10.51253/pafmj.v72i3.4338.
5. Liu H, Yu H, Xia J, Liu L, Liu GJ, Sang H, et al. Topical treatments for acne vulgaris. Cochrane Database Syst Rev 2020;5(5):CD011368. doi:10.1002/14651858.CD011368.pub2.
6. Tang SC, Yang JH. Dual effects of alpha-hydroxy acids on the skin. Molecules 2018;23(4):863. doi:10.3390/molecules23040863.
7. Zaenglein AL, Pathy AL, Schlosser BJ, Alikhan A, Baldwin HE, Berson DS, et al. Guidelines of care for the management of acne vulgaris. J Am Acad Dermatol 2016;74(5):945-973.e33. doi:10.1016/j.jaad.2015.12.037.
8. Pavithra S, Gopalakrishnan K, Shanmugam J. Efficacy of 70% glycolic acid peel versus 30% salicylic acid peel in the treatment of mild to moderate acne vulgaris: a retrospective study. J Clin Diagn Res 2022;16(11):WC05-WC08. doi:10.7860/JCDR/2022/57286.17124.
9. Dayal S, Kalra KD, Sahu P. Comparative study of efficacy and safety of 45% mandelic acid versus 30% salicylic acid peels in mild-to-moderate acne

vulgaris. J Cosmet Dermatol 2020;19(2):393-399. doi:10.1111/jocd.13168.
10. Manjhi M, Yadav P, Yadav A, Sagar V, Ramesh V. A comparative study of 50% glycolic acid peel and 30% salicylic acid peel in mild to moderate acne: a split face study. J Evid Based Med Healthc 2020;7(49):2954-2958. doi:10.18410/jebmh/2020/604.
11. Garg VK, Sinha S, Sarkar R. Glycolic acid peels versus salicylic-mandelic acid peels in active acne vulgaris and post-acne scarring and hyperpigmentation: a comparative study. Dermatol Surg 2009;35(1):59-65. doi:10.1111/j.1524-4725.2008.34483.x.
12. Bhate K, Williams HC. Epidemiology of acne vulgaris. Br J Dermatol 2013;168(3):474-485. doi:10.1111/bjd.12149.
13. Williams HC, Dellavalle RP, Garner S. Acne vulgaris. Lancet 2012;379(9813):361-372. doi:10.1016/S0140-6736(11)60321-8.
14. Almeman AA. Evaluating the efficacy and safety of alpha-hydroxy acids in dermatological practice: a comprehensive clinical and legal review. Clin Cosmet Investig Dermatol 2024;17:1661-1685. doi:10.2147/CCID.S453243.
15. Li Y, Wang X, Chen Q, et al. Acne treatment: research progress and new perspectives. Front Med 2024;11:1425675. doi:10.3389/fmed.2024.1425675.
16. Reynolds RV, Yeung H, Cheng CE, Cook-Bolden F, Desai SR, Druby K, et al. Guidelines of care for the management of acne vulgaris. J Am Acad Dermatol 2024;90(5):1006.e1-1006.e30. doi:10.1016/j.jaad.2023.12.017.
17. Almeman AA. Evaluating the efficacy and safety of alpha-hydroxy acids in dermatological practice: a comprehensive clinical and legal review. Clin Cosmet Investig Dermatol 2024;17:1661-1685. doi:10.2147/CCID.S453243.
18. Reynolds RV, Yeung H, Cheng CE, Cook-Bolden F, Desai SR, Druby K, et al. Guidelines of care for the management of acne vulgaris. J Am Acad Dermatol 2024;90(5):1006.e1-1006.e30. doi:10.1016/j.jaad.2023.12.017.