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Original Article

Dermatology Section

Efficacy of 70% Glycolic Acid Peel versus 30% Salicylic Acid Peel in the Treatment of Mild to Moderate Acne Vulgaris: A Retrospective Study

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ABSTRACT

Introduction: Chemical peels have become a useful modality in the management of acne in addition to topical and systemic medications. Studies done to evaluate the effectiveness of peels have compared only lower concentration of Glycolic Acid (GA) (35%) and Salicylic Acid (SA) peels. Higher concentrations of glycolic acid i.e., (70%) are reported to be safe and more effective than lower concentrations. Despite reported advantages of higher concentration of glycolic acid peel, no published data is available regarding its efficacy, safety and tolerability in comparison with other peels.

Aim: To compare the effectiveness of 70% GA peel with 30% SA peel in the management of mild to moderate acne.

Materials and Methods: The present study was a cross-sectional retrospective study conducted from December 2021 to April 2022 in which, 60 participants were enrolled. They were diagnosed with mild to moderate acne, based on the Indian Acne Alliance (IAA) grading system and all of them underwent chemical peel treatment. Among them, 30 had received 70% GA peel (group 1) and 30 had received 30% SA peel (group 2). The number of sittings and the individual lesional count at baseline and at each sitting were recorded. Acne lesional count (sum of comedones, papules, pustules, and nodules) was recorded at baseline, and at two, four, six and eight weeks. Categorical variables were presented as frequency and percentages. Continuous variables were presented as Mean±Standard deviation.

Results: There was a significantly greater decrease in mean acne lesional count in group 2 from the baseline of 25.73 to 13.83 at the end of 2nd week in comparison to group 1, wherein the values reduced from 26.30 to 17.73 (p-value of 0.003). At the end of eight weeks, the mean acne lesional count of both groups (group 1-2.17 and group 2-1.50, p-value of 0.097) were comparable.

Conclusion: Higher concentration of GA (70%) has comparable effectiveness to 30% SA peel in management of mild to moderate acne. SA peel has an advantage of earlier decrease in lesional count.

Keywords: Alpha hydroxy acid, Chemical peeling, Lesional count

INTRODUCTION

Acne is one of the most common skin ailments among young adults [1]. It is a source of significant distress due its sequelae like Postinflammatory Hyperpigmentation (PIH) and scarring. Regular use of topical and systemic antiacne medications can be difficult in the fast-paced life. Chemical skin peeling has become a valuable tool in addressing not only in remission of acne but also its sequelae. Alpha hydroxy and beta hydroxy acid are the two commonest peels used widely [2]. Alpha hydroxy acids have been extensively studied in the management of acne [3]. GA, is an alpha hydroxy acid which thins the stratum corneum, promotes epidermolysis and disperses basal layer melanin [4]. It is commonly used in the lower concentration of 35%. Higher concentrations i.e., 70% GA causes epidermal separation and stimulation of dermal collagen [5]. Repeated application of it also causes dermal thickening and improvement in acne scars [6]. SA, a beta hydroxy acid peel has comedolytic effect owing to its lipophilic action and dissolves intercellular cement. It also has anti-inflammatory property by inhibiting arachidonic acid. It has self-precipitating property and thereby does not cause deep injuries and has high safety profile. All these make SA peel the most preferred in the management of acne [7]. The most effective concentration of it is 30% and usually requires multiple sittings done every 2-3 weeks [8].

There are several studies published which have compared 35% GA against 30% SA peel and other combination peels [9]. Higher concentration of GA (70%) are being routinely used by dermatologist when lower concentration does not give desired results and are as safe as lower concentrations and no serious adverse effects are reported [10]. To the best of our knowledge, comparative studies between higher concentration of GA (70%) and SA peels have not been published in the English literature, hence, the present study was undertaken to compare the efficacy of 70% GA and 30% SA peel in the treatment of acne vulgaris.

MATERIALS AND METHODS

A cross-sectional retrospective study was undertaken in the Department of Dermatology, using the data available in the case files of patients who underwent peel treatment for acne. The duration of the study was from December 2021 to April 2022 using the data collected between January 2021 to November 2021. Institutional Ethical Committee (IEC) approval was obtained (42/IHEC/2021/KMCHIHSR). The case files were retained in the hospital and at each visit details including clinical findings and procedures done were updated.

Inclusion criteria: Patients clinically diagnosed with mild and moderate acne using IAA [Table/Fig-1] grading of acne [11]. From this population, records of those who had underwent chemical peel treatment with either 70% GA or 30% SA at two weekly intervals, and had mild and moderate acne vulgaris, were included in the study.

Exclusion criteria: Patients who were on any acne inducing medications, and who had taken oral Isotretinoin in the past six months were excluded from the study.

Grading	Criteria required
Mild Acne (Grade I) Predominance of Comedones	Comedones <30 Papules <10 No scarring
Moderate Acne (Grade II) Predominance of Papules	Comedones any number Papules >10 Nodules <3 Scarring±
Severe Acne (Grade III) Mostly Nodules	Comedones any number Papules any number Nodules/Cysts >3 Scarring+

[Table/Fig-1]: IAA grading of acne [11].

Peel Protocol

The following protocol is routinely followed in all patients undergoing peel treatment.

Each session of chemical peeling is always performed by a trained dermatologist. After obtaining informed consent, the demographic and clinical data including individual lesional count was entered into their case files at baseline and at every subsequent sitting. With the patient in supine position the face is degreased with an alcohol swab. Surgical cap is used to pull back the hair and cover the ears. The corners of the eyes and nasal crease is protected with petroleum jelly. Single coat of peeling agent was applied with cotton tipped applicator or peel brush on full face and left till end points.

For 70% GA peel, mild burning and mild erythema is the end point and sodium bicarbonate solution is the neutraliser. For 30% SA, pseudo frosting is the end point and chilled water is the neutraliser. Finally, face is washed with running water. No priming agents were used. Post peel sunscreen lotions are applied, and strict sun protection advise given to the patients.

Sample size: The clinical findings of all patients undergoing chemical peel treatment, as maintained in their respective case files, were recorded. The demographic data and clinical data including the counts of individual acne lesions at baseline and at every subsequent peel session were noted. Overall, 67 eligible datasets (32 received 70% GA peel and 35 received 30% SA peel) were considered. After this screening, seven data-sets were excluded due to presence of truncal acne (two had received GA peel and five had received SA peel). Finally, 30 participants were included as study participants-Group 1 (GA peel, n=30) and Group 2 (SA peel, n=30).

Data Collection

An excel sheet was created to compile demographic details like age, sex, and duration of acne. Clinical details including number of comedones, papules, pustules, and nodules at baseline, and at two, four, six and eight weeks were also taken. These data were extracted from the individual patient case files maintained in the hospital.

Evaluation of baseline and response: Acne lesional counting (recording the number of each type of acne lesions-comedones, papule, pustule, and nodule), and their sum total at each sitting was taken as the parameter to assess the response to treatment. Lesional counting, though time consuming is an objective, more accurate assessment method compared to other grading systems, since it can measure the response to treatment to individual lesions [12].

STATISTICAL ANALYSIS

The data entered in excel was analysed using Statistical Package for the Social Sciences (SPSS) software version 26.0. Categorical variables were presented as frequency and percentages. Continuous variables were presented as Mean±Standard deviation. Chi-square test was used to measure the association between qualitative demographic variables to check for the comparability of the data. Independent sample t-test was used to measure the mean values between both the groups with respect to each type of acne lesions. Analysis of Variance (ANOVA) was used to find the mean difference between each lesion within the group with respect to time (2,4,6,8 weeks), p-value <0.05 was statistically significant.

RESULTS

There was no significant difference between both the groups with respect to age, gender and duration of symptoms, mean acne lesional count, mean number of papules, pustules, comedones and nodules at the start of the study [Table/Fig-2].

Parameters	Group 1 Mean±SD	Group 2 Mean±SD	Mean deviation	t-value	p-value
Age (in years)	25.70±5.79	23.77±4.38	1.933	1.457	0.150
Duration (in years)	2.00±1.41	1.57±0.77	0.433	1.472	0.433
Acne lesional count	26.30±5.91	25.73±5.11	0.567	0.397	0.693
Mean comedone count	10.40±3.73	10.13±3.56	0.267	0.283	0.778
Mean papule count	12.30±3.76	12.07±3.45	0.233	0.250	0.803
Mean pustule count	3.53±2.50	3.50±2.55	0.033	0.051	0.959
Mean nodule count	0.07±0.25	0.10±0.30	0.033	-0.460	0.647

[Table/Fig-2]: Demographic data and the mean acne lesional count at baseline.

There was a significant reduction in the mean acne lesional count [Table/Fig-3] and mean count of comedones, papules and pustules from second week onwards in group 2 [Table/Fig-4]. However, at the end of eight week, the reduction in mean acne lesional count was similar in both groups [Table/Fig-3,4]. Since nodules were not present in either group after the end of two weeks, no significant difference between the groups could be ascertained with respect to nodules. When compared within the groups, there was a significant reduction in all the parameters measured for each fortnight [Table/Fig-3]. Three participants who received 70% GA peel had developed burning sensation, erythema, and scaling on the next day of peel. They were managed with non comedogenica emollient application during daytime and low potent topical corticosteroid cream once daily application at bedtime. The side-effects resolved within a weeks' time. The baseline status and the clinical improvement seen post eight weeks of therapy for a patient in GA peel group are shown in [Table/Fig-5a,b] respectively. [Table/Fig-6a,b] depict a patient's baseline and post-treatment response in SA group, respectively.

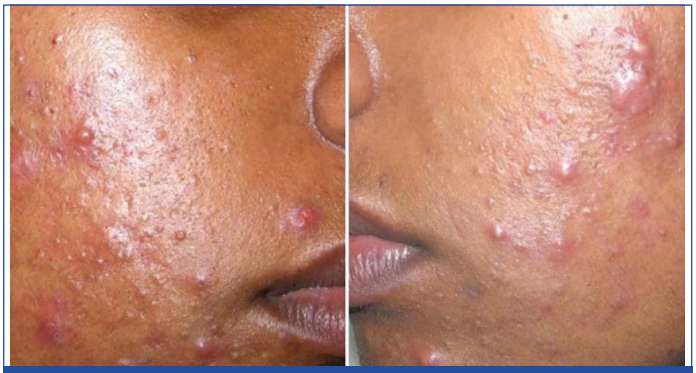
Parameters	Group 1 Mean±SD	Group 2 Mean±SD	Mean deviation	t-value	p-value
At 2 weeks	17.73±4.76	13.83±4.80	3.900	3.157	0.003
At 4 weeks	11.07±4.09	8.30±3.01	2.767	2.279	0.004
At 6 weeks	5.80±2.90	4.37±2.05	1.433	2.205	0.031
At 8 weeks	2.17±1.91	1.50±1.09	0.667	1.688	0.097

[Table/Fig-3]: The mean acne lesional count at each sitting.

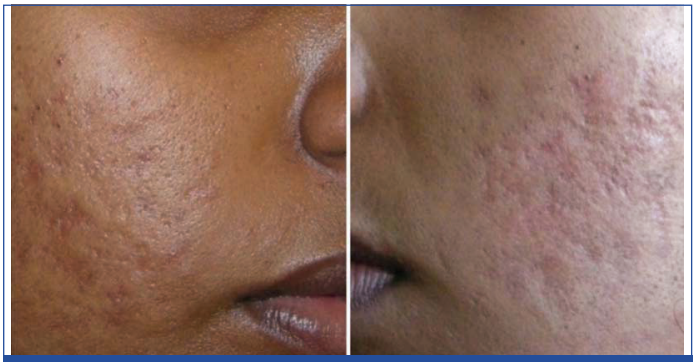
Parameters	Group 1 Mean±S.D	Group 2 Mean±SD	Mean deviation	t-value	p-value
Comedone					
2 weeks	7.17±2.23	5.37±2.53	1.800	2.883	0.006
4 weeks	4.83±1.96	3.47±1.77	1.367	2.825	0.006
6 weeks	2.83±1.34	2.17±1.05	0.667	2.141	0.036
8 weeks	1.17±1.17	0.77±0.56	0.400	1.676	0.099
Papule					
2 weeks	7.80±3.03	6.47±3.12	1.333	1.677	0.099
4 weeks	4.77±2.73	3.70±1.68	1.067	1.817	0.074
6 weeks	2.30±1.46	1.70±1.08	0.600	1.801	0.077
8 weeks	0.83±0.69	0.67±0.54	0.167	1.029	0.308

Pustule					
2 weeks	2.93±2.01	1.87±1.04	1.067	2.575	0.013
4 weeks	1.47±1.22	1.13±0.62	0.333	1.327	0.190
6 weeks	0.70±0.70	0.47±0.57	0.233	1.412	0.163
8 weeks	0.17±0.37	0.07±0.25	0.100	1.201	0.235
Nodule					
2 weeks	0.00±0.00	0.07±0.25	0.067	-1.439	0.155

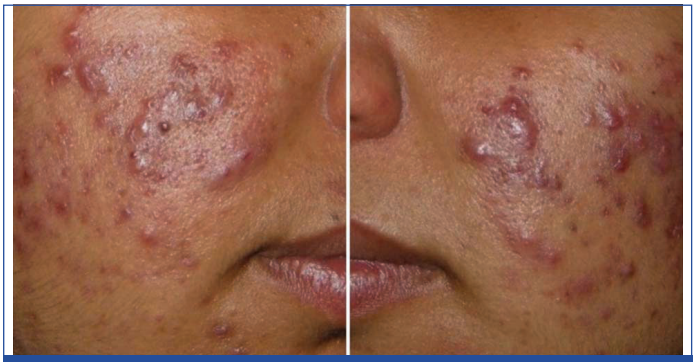
[Table/Fig-4]: The mean reduction in individual lesions after each sitting.



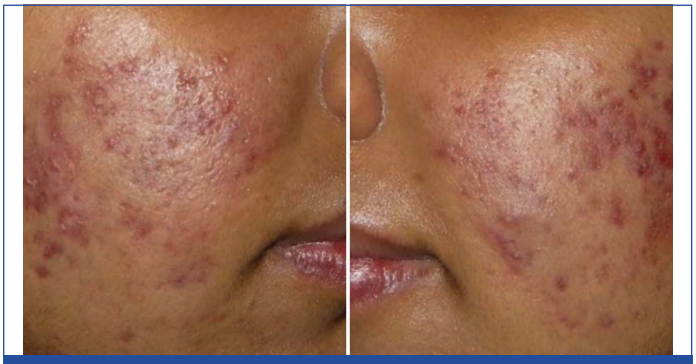
[Table/Fig-5a]: A patient of GA peel group prior to treatment.



[Table/Fig-5b]: Clinical response noted with 70% GA peel at 8 weeks.



[Table/Fig-6a]: A patient of SA peel group prior to treatment.



[Table/Fig-6b]: Clinical response noted with 30% SA peel at 8 weeks.

DISCUSSION

Acne vulgaris is one among the most common sufferings of adolescents and young adults. Many do not seek treatment considering it as a common age-related issue and end up in postacne complications, like, pigmentation and scarring. Prevention of such complications by appropriate and early treatment is of paramount importance. The therapeutic goal aims at reducing sebum secretion, correcting the ductal hypercornificaftion, reducing *Cutibacterium acnes* colonisation and preventing the release of inflammatory mediators all of which contribute to the pathogenesis of acne. A study done by Khee HJ et al., evaluated the effectiveness and safety of 70% GA along with Vitamin C serum topical application in the management of acne scars. They reported excellent safety profile and statistically significant improvement in postacne scarring. However, the study did not intend to evaluate the effectiveness of GA peel on active acne lesions [10].

Sharma P et al., evaluated the efficacy of peels as a sole therapy in the management of active acne. They compared 35% GA peel vs 30% SA peel by treating 200 grade 1 and 2 acne patients with 100 patients in each group. Both the peels were effective as monotherapy in the treatment of acne and 30% SA peel was better in reducing comedones, papules and pustules but it caused more burning, erythema, and dryness in comparison to 35% GA peel [13]. Another study that compared 35% GA peel with Salicyclic-10%, Mandelic acid and Phytic acid combination peel concluded that all three peels were effective in the treatment of mild to moderate acne in Asian population and all were well tolerated [9]. To the best of our knowledge, studies comparing 70% GA peel with other peels have not been published in the English literature. Hence, the present study evaluated the effectiveness of 70% GA peel in comparison with 30% SA peel in mild to moderate acne.

The present study infers that 70% GA peel was well tolerated by the participants and only three reported side-effects like erythema and burning sensation which was resolved within a week. This was in line with study done by Khee HJ et al., [10]. The SA peel was also well tolerated in this study in contrast to Sharma P et al., wherein they reported more erythema, burning and dryness in comparison to GA peel [13]. This could be due to differences in peel application technique and delayed or inadequate washing of peel after achieving endpoint. A significantly higher reduction in the number of comedones, papules and pustules from second week onwards in SA group in comparison to GA group was noted. This observation was similar to the study by Sharma P et al., [13]. But in contrast a report by Goel B et al., showed there was not much difference between the 30% SA group and 35% GA group at the end of two weeks [14]. This could be due to inherent difference in the severity of acne and response to peel treatment in the population and other unforeseen confounding factors. However, at the end of eight weeks, the reduction in acne lesional count and individual lesional count were similar in both groups in the present study. This was in line with studies published by Sarkar R et al., Sharma P et al., and Goel B et al., wherein at the end of their respective studies both 30% SA and 35% GA peels had similar outcome [9,13,14].

Limitation(s)

The sample size selected was kept to a number minimum required for a study, keeping in mind the high dropout rates because of multiple sessions of peel treatments required.

CONCLUSION(S)

Both higher concentration of GA (70%) and 30% SA peels are effective in the management of mild to moderate acne with SA peel having an advantage of earlier decrease in lesional count. Though higher concentration of GA peel are reported to improve postacne scarring and PIH further studies are needed to confirm this.

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