

## Salicylic Acid Versus Glycolic Acid Peel in Active Acne

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### ABSTRACT

**Objective:** To compare the efficacies of Salicylic acid and Glycolic acid peel in patients with active acne.

**Study Design:** Quasi-experimental study.

**Setting and Duration of Study:** Department of dermatology, Pak Emirates Military Hospital, (PEMH) Rawalpindi Pakistan, Dec 2018 to Jan 2020.

**Methodology:** A total of 300 patients with active acne were included in this study. Patients were randomized into groups by lottery method. Group-A was given 30% Salicylic acid, while Group-B was given 70% Glycolic acid to control active acne. A grading system developed by Hayashi *et al*, was used to assess the response. A score less than six after 12 weeks was considered a positive response. In addition, the type of treatment and other factors were compared in the patients with and without a positive response after the designated treatment.

**Results:** Out of 300 patients with active acne included in the study, 172 (57.3%) had a positive response, while 128 (42.7%) had not achieved a positive response after the twelve-week treatment. Use of 30% Salicylic acid, lesser duration of acne and more minor age of the patients had a statistically significant relationship with a positive response in the study population ( $p$ -value 0.010, 0.005 and 0.001, respectively).

**Conclusion:** A significant number of patients did not respond to standard therapy of acne vulgaris. However, chances of achieving a positive response increase with 30% Salicylic acid instead of 70% Glycolic acid, lesser duration of acnes and young patients have more chances of getting a positive response at the end of the therapy.

**Keywords:** Acne vulgaris, Glycolic acid peel, Salicylic acid peel.

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## INTRODUCTION

Skin conditions always make a big chunk of diseases encountered by general physicians, medics and dermatologists. People get worried when their face is involved in some pathology and approach the doctor with much concern and demand quick and definitive management.<sup>1</sup> A lot of immunological and infective conditions involve the skin, especially the face, and require targeted and sometimes long-term therapy to achieve effective results.<sup>2</sup>

Acne vulgaris is a common skin condition that dermatologists have managed worldwide, and its incidence is on the rise as well.<sup>2</sup> Much work has been done to find the exact cause of this illness, causing disfigurement to thousands of faces each year worldwide. However, aetiology remains multifactorial without any single cause pointed out. With the current evidence, it is believed that infective and immune-based etiologies could be linked with this disease.<sup>3</sup> Keeping into account this etiopathogenesis model, various treatment modalities have been used to manage the

patients with this condition.<sup>3</sup>

Antibiotics for a long have been the mainstay of treatment in case of acne vulgaris.<sup>4</sup> Both topical and oral agents have been used. In addition to that, various other treatment modalities have also been tried. Topical therapies have always been an area of interest for the treating physicians and researchers as they usually bring minimum systemic side effects.<sup>5,6</sup> In 2009, Garg *et al*, performed a study intending to compare 35% GA peels and 20% salicylic-10% mandelic acid peels (SMP) in terms of efficacy and safety among patients with active acne at the time of study or scarring due to acne or pigmentation related problems. They came up with the conclusion that both the agents were efficacious as well as safe in their target population. SMPs were more effective for pigment-related problems.<sup>7</sup> Sarkar *et al*, in 2019 concluded that both 35% Glycolic acid and 20% Salicylic-10% were associated with reduced lesions of all types among acne patients. The adverse effect profile was also very mild, and no statistically significant difference was observed in the groups concerning any specific side effects.<sup>8</sup> In 2011, Dreno *et al*, came up with an interesting review article on the studies done in this regard, but this study was negative and analyzed that

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these studies were unable to generate generalizable results; therefore, more studies with better methodology should be done.<sup>9</sup> Study done in 2019 by Dayal *et al*, was designed to look for differences regarding therapeutic parameters between 45% Mandelic acid (MA) peel and 30% Salicylic acid (SA) peel among patients with mild-to-moderate facial acne vulgaris. They concluded that about 45% of MA peel was equally effective as 30% of SA peel in mild-to-moderate facial AV. However, the safety and tolerability of MA peel were better than SA peel.<sup>10</sup>

As in all parts of the world, people in our part of the world have also been conscious of their facial beauty and get distressed by acne problems. However, a dermatologist usually has to rely on the guidelines and studies done in the west due to limited local data. Therefore, to bridge this gap, we planned this study to compare the efficacies of Salicylic acid and Glycolic acid peel in active acne at the dermatology department of Pak Emirates Military Hospital of Pakistan.

## METHODOLOGY

This quasi-experimental study was conducted at the Department of Dermatology in Pak Emirates Military Hospital, Rawalpindi Pakistan from December 2018 to January 2020. WHO Sample Size Calculator calculated the sample size with a population proportion of 70% and 60%.<sup>11</sup> Non-probability consecutive sampling technique was used to gather the sample for this study.

**Inclusion Criteria:** Patients of both genders between the age of 18 and 55 years, with active acne vulgaris diagnosed by consultant dermatologists were included in the study.

**Exclusion Criteria:** Patients with active/recurrent herpes infection or patients with a history of hypertrophic scarring/keloid were excluded. Patients with oral Isotretinoin intake in the past six months, pregnant and lactating women were also excluded from the study.

IREB approval (via letter number: A/28/63/20) was taken from the Ethical Committee of PEMH. Patients who did not give written consent after the description of the study were not included in the analysis. Patients were divided into two groups, A and B. Randomization was done via lottery method, so every patient had equal chances of falling into any of the two groups. Group-A was given 30% Salicylic acid. In comparison, Group-B was given the 70% Glycolic acid to control active acne biweekly for 12 weeks.<sup>12</sup> Grading system developed by Hayashi *et al*, was used to assess

the response.<sup>13,14</sup> This system has been used worldwide by dermatologists to grade acne. The appropriate divisions of inflammatory eruptions of half of the face to decide classifications were: 0-5, "mild"; 6-20, "moderate"; 21-50, "severe"; and more than 50, "very severe".<sup>14</sup>

Statistical Package for Social Sciences (SPSS) version 24.0 was used for the data analysis. Participants' characteristics and the patients' distribution with the positive response to the treatment were described using descriptive statistics. Chi-square was applied to look for the correlation of age, gender, duration of acne vulgaris and type of treatment with the positive response. The *p*-value less than or equal to 0.05 was used to establish the significant differences and associations.

## RESULTS

The target population was all the acne vulgaris patients reporting the dermatology OPD and not taking any oral medication for their condition. The exclusion and inclusion criteria and informed consent procedure made the sampling frame small, and only 300 patients could be recruited for the study in the given period. The mean age of the study participants was  $36.33 \pm 6.643$  years. 160 (54.3%) were males, while 140 (46.7%) were females. Table showed that out of 300 patients with acne vulgaris included in the study, 172 (57.3%) had a positive response to the treatment, while 128 (42.7%) had not shown a positive response even after the adequate treatment. The use of 30% Salicylic acid peels, lesser duration of acne vulgaris and more minor age of the patients had a statistically significant relationship with the presence of positive response to the treatment in the study population.

**Table: Outcome of various variables studied in the analysis.**

Factors studied	Positive Response	No Positive Response	<i>p</i> -value
<b>Age</b>			
<40 years	95 (55.2%)	44 (34.4%)	<0.001
>40 years	77 (44.8%)	84 (65.6%)	
<b>Gender</b>			
Male	97 (56.4%)	63 (49.2%)	0.218
Female	75 (43.6%)	65 (50.8%)	
<b>Duration of Acne Vulgaris</b>			
<2 years	101 (58.7%)	54 (42.2%)	0.005
>2 years	71 (41.3%)	74 (57.8%)	
<b>Type of Treatment</b>			
30% Salicylic Acid	72 (41.9%)	34 (26.6%)	0.006
70% Glycolic Acid	100 (58.1%)	94 (73.4%)	

## DISCUSSION

Patients with acne vulgaris use a lot of medical and even alternate medicine treatments to get rid of

this chronic and recurring skin condition.<sup>5,15</sup> General physicians also prescribe a lot of antibiotics and topical agents. Previous epidemiological studies done in our world have concluded that acne vulgaris has been a fairly common diagnosis in dermatology clinics, especially for the young population. However, they have different beliefs regarding its aetiology and management.<sup>16,17</sup> Fox *et al*, in their detailed analysis, chalked out various management steps to cater for the patients suffering from acne vulgaris. It ranged from topical options to systemic options.<sup>6</sup> As in case of many dermatological conditions, and acne vulgaris lesions may benefit both from topical or systemic therapies or sometimes a combination of both.<sup>6</sup> Still there is no consensus on which treatment modality is best for patients in our part of the world. Therefore, we planned this study to compare the efficacies of Salicylic acid and Glycolic acid peel in active acne at the dermatology department of Pak Emirates Military Hospital Rawalpindi, Pakistan.

Garg *et al*,<sup>7</sup> performed a study with a similar objective to our study i.e., to compare the therapeutic efficacy and tolerability of 35% GA peels and 20% Salicylic-10% Mandelic acid peels in active acne and post-acne scarring and hyperpigmentation. They concluded that both the agents were effective and safe in Indian patients, with SMPs being better for active acne and post-acne hyperpigmentation.<sup>7</sup> Findings of our study were similar to them. SA peels emerged as a better modality in our analysis as well.

Dayal *et al*, published a study on Indian patients with acne in 2019 to compare 45% MA peel with 30% SA peel in terms of the efficacy and adverse effects profile. They concluded that in terms of management of acne vulgaris, both the treatment options were equally effective. MA peel, however, emerges as a more safe and tolerable option for the study participants of their study.<sup>10</sup> Our results were slightly different from ours as we only studied the efficacy, which was superior in the SA group ( $p$ -value  $<0.05$ ). Studying the side effect profile was not part of our objective.

Gender was not statistically significantly related to the treatment response in our study ( $p$ -value  $>0.5$ ). Bagatin *et al*, published a comprehensive review in 2019 to develop a guide for the clinical practice of adult female acne.<sup>18</sup> Authors concluded that treatment response is more difficult to achieve in female patients with acne than in male patients. Still, there is no proper treatment guideline to eradicate this disease in the female population which has a more significant impact,

and management is much more difficult. Though our study did not establish any link to a lack of positive response with the gender still, more studies in future may demonstrate a positive relationship.

The study of Sarkar *et al*,<sup>8</sup> published in 2019 is very close to our study in terms of design and target population as it was conducted in our neighbouring country India to compare 35% Glycolic Acid, 20% Salicylic-10% Mandelic Acid, and Phytic Acid Combination Peels in the Treatment of Active Acne and Post-acne Pigmentation. Authors concluded that age has a relationship with treatment response which was replicated in our study as well. Nevertheless, the finding regarding the duration of acne was different. Their analysis revealed no significant relationship between treatment response with the duration of acne ( $p$ -value  $>0.05$ ), but our statistics revealed a significant relationship between these two variables ( $p$ -value  $<0.05$ ).

## CONCLUSION

A significant number of patients did not respond to topical therapy of acne vulgaris with chemical peels. However, chances of achieving a positive response increase with 30% Salicylic acid instead of 70% glycolic acid, lesser duration of acne and young patients have more chances of getting a positive response at the end of the therapy.

**Conflict of Interest:** None.

## Author's Contribution

KA: Conception, Design, NI: Analysis, writing, MH: Interpretation, ZZ:, SO: Data collection, MM: Design.

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