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EFFICACY AND SAFETY OF SEQUENTIAL PEELING (SALICYLIC ACID AND GLYCOLIC ACID) IN POST ACNE HYPERPIGMENTATION

Dermatology

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ABSTRACT

INTRODUCTION: Post acne hyperpigmentation is a common sequela in acne patients. Sequential peel is use of more than one chemical peel at a time in a sequential manner. Salicylic acid has keratolytic, comedolytic, anti-inflammatory and anti-microbial activity. Glycolic acid has keratolytic, moisturising and metabolic activity. Salicylic acid when applied sequentially with glycolic acid leads to deeper penetration of glycolic acid at lower concentration with less side effects. **AIM:** To determine efficacy and safety of salicylic acid and glycolic acid as sequetial peeling in post acne hyperpigmentation. **MATERIALS AND METHODS:** 33 patients with post acne hyperpigmentation were undergone sequential peeling fortnightly for four sittings with salicylic acid (20%) followed by glycolic acid (35%). Pre- and post treatment photographs were taken. Assessment was done using Global Aesthetic Improvement Scale by patient as well as physician. **RESULTS:** 31 patients completed the study out of enrolled 33 patients. Improvment seen was 12.1 %, 27.3%, 51.5 % and 81.8 % of patients at 1st , 2nd, 3rd and 4th sitting respectively on subject global aesthetic improvement scale assessed by patient. Assessment by physician in terms of 18.2%, 39.4%, 66.7% and 90.9% patients showed improvement at 1st , 2nd, 3rd and 4th sitting respectively. 28 patients had experienced immediate burning and stinging sensation. Erythema remain persisted in 4 patients, while demarcation line developed in 2 patients. On Subject Global Aesthetic Improvement Scale, only one patient had accentuation of pigmentation. **CONCLUSION:** Sequential peeling is effective in post acne hyperpigmentation. Deeper penetration of salicylic acid can be achieved by low concentration of glycolic acid with less side effects and increasing safety and efficacy.

KEYWORDS

Post acne hyperpigmentation, Sequential peeling, Salicylic acid, Glycolic acid

INTRODUCTION

Post acne hyperpigmentation is a common sequela in acne patients. Its severity correlates with the the intensity of the inflammatory process and underlying propensity based on the skin type. Various topical creams containing hydroquinone, kojic acid, azelaic acid and retinoids can be used in treatment. At times, topical creams are less effective and require longer duration of application.[1] For extensive or persistent pigmented marks after acne, interventional therapies with chemical peels enable improvement in post acne pigmentation and should be definitely considered.[5]

Chemical peel is a procedure where chemical agents are applied to the skin surface to produce controlled destruction of the portions of the epidermis and or dermis.[1]

Sequential peels are chemical peels using more than one peel at a time in a sequential manner as they may not be compatible in a single formulation.[2]

Salicylic acid is a beta hydroxy acid and has a pK_a of 3. It is highly soluble in ethanol and minimally in water. It has keratolytic, comedolytic, anti-inflammatory and anti-microbial activity.[2]

Glycolic acid (GA) is an alpha hydroxy acid with a keratolytic, moisturising and metabolic activity. It works by reducing enzymes like sulfotransferase, phosphotransferase and kinase, which fix the sulfate and phosphate groups to the surface of the corneocytes. Reduction of these enzymes decreases the cohesion between the corneocytes and cause exfoliation. This is called as metabolic activity. This action is possible only at an acidic pH. If pH is high, it works as moisturiser.[2]

AIM AND OBJECTIVES

To determine the efficacy and safety of sequential peeling with salicylic acid and glycolic acid in post acne hyperpigmentation.

METHODOLOGY

Study has been conducted at a dermatology OPD, new civil hospital, surat for a period of 3 months.

INCLUSION CRITERIA

- Given informed valid consent
- Age between 20 – 40 years
- Having post acne hyperpigmentation

EXCLUSION CRITERIA

- Do not give informed valid consent
- With unrealistic expectation
- Uncooperative patient
- Active infection at treatment site
- Open wounds
- Patients on photosensitive drugs

Detailed history and clinical examination was done. All patients were advised about standard pre and post peel care and follow up. Pre- and post-treatment photographs were taken.

WITHDRWAL AND DROPOUT

Patients had free choice to withdraw from participation in study at any time without prejudice to further treatment. They were asked for the reasons of discontinuation and presence of any adverse event.

PRIMING[3]

Proper counselling was undertaken. Priming was done with retinoic acid 0.025% at night and advised to use sunscreen containing >30 SPF during daytime. Patients were advised to avoid any cosmetics application and to stop retinoid 1 week before the peel.

PROCEDURE[2]

Face wash with soap and water
↓
The patient was asked to lie down with head elevated to 45^0 with the eyes closed
↓
Skin was cleaned with alcohol and then degreased with acetone.
↓
20% salicylic acid peeling was done using brush
↓
After pseudo-frosting occurs then wash with water
↓
Later **35%** Glycolic acid Peeling was done
↓
Neutralized using peel neutralizer (15% sodium bicarbonate) and wash with water

POST PEEL CARE[3]

Patients were advised for strict photoprotection and sunscreen containing >30 SPF application, cold compresses to soothe the skin for 1-2 days post peel, non-comedogenic moisturizers until peeling was completed and avoid peeling or scratching the skin.

FOLLOW UP

This procedure was repeated fortnightly for 4 times.

ASSESSMENT CRITERIA[4]

Assessment was done at 15 days after each sitting, based on Physician Global Aesthetic Improvement Scale (PGAIS) assessed by a physician and Subject Global Aesthetic Improvement Scale (SGAIS) assessed by the patient.

The GAIS is a 5-point scale (1-5) describing an overall assessment as follows:

5- Very Much Improvement
4- Much Improvement
3 - Improvement
2 - No Change,
1 – Worse

RESULTS

Out of 33 patients enrolled, 31 had completed the study. 23 females and 10 males having age between 20-40 years were included in study.

Table-1: Results based on PHYSICIAN GAIS

GAI-Scale	After 1st sitting	After 2nd sitting	After 3rd sitting	After 4th sitting
1	2 (6.45%)	2 (6.45%)	1 (3.22%)	0
2	23 (74.19%)	17 (54.84%)	10 (32.25%)	3 (9.67%)
3	2 (6.45%)	2 (6.45%)	3 (9.67%)	3 (9.67%)
4	3 (9.67%)	3 (9.67%)	3 (9.67%)	3 (9.67%)
5	1 (3.22%)	7 (22.58%)	14 (45.16%)	22 (70.96%)

On physician GAIS, after 1st sitting, 2 patients had worsening of lesions, 23 patients showed no change and 6 patients were showing improvement. After 2nd sitting, 2 patients had worsening of lesions, 23 patients showed no change and 12 patients were showing improvement. After 3rd sitting, single patient had worsening of lesions, 10 patients showed no change and 20 patients were showing improvement.

At the end of study, 28 patients were showing improvement, 3 patients showed no change and not a single patient had worsening of lesions.

Table-2: Results based on SUBJECT GAIS

GAI-Scale	After 1st sitting	After 2nd sitting	After 3rd sitting	After 4th sitting
1	5 (16.13%)	4 (12.9%)	2 (6.45%)	2 (6.45%)
2	22 (70.97%)	20 (64.51%)	13 (41.93%)	4 (12.9%)
3	1 (3.22%)	0	2 (6.45%)	3 (9.67%)
4	2 (6.45%)	1 (3.22%)	3 (9.67%)	4 (12.9%)
5	1 (3.22%)	6 (19.35%)	11 (35.48%)	18 (58.06%)

On subject GAIS, after 1st sitting, 5 patients had reported worsening of lesions, 22 patients experienced no change and 4 patients were feeling improvement. After 2nd sitting, 4 patients had worsening of lesions, 20 patients showed no change and 7 patients were showing improvement. After 3rd sitting, 2 patients had worsening of lesions, 13 patients showed no change and 16 patients were showing improvement.

At the end of study, 25 patients were showing improvement, 2 patients had worsening of lesions and 4 patients showed no change.

Table-3: Comparison of physician and subject GAIS

	No. (%) of patients showing **very much** improvement (score= **5**)			
GAIS	After 1st sitting	After 2nd sitting	After 3rd sitting	After 4th sitting
Physician GAIS	1 (3.2%)	7 (22.5%)	14 (45.5%)	22 (70.9%)
Patient GAIS	1 (3.2%)	6 (19.3%)	11 (35.5%)	18 (58%)

After 1st sitting, only one (3.2%) patient was showing very much improvement as per physician GAIS and subject GAIS. After 2nd sitting, 7 (22.5%) patient were showing very much improvement as per physician GAIS while 6 (19.3%) patient were showing very much improvement as per subject GAIS. After 3rd sitting 14 (45.5%) patient were showing very much improvement as per physician GAIS while only 11 (35.5%) patient were showing very much improvement as per subject GAIS.

At the end of study, 22 (70.9%) patients were showing very much improvement as per physician GAIS while only 18 (58%) patient were showing very much improvement as per subject GAIS.

At the end of study, 2 (6.45%) patients reported worsening of lesions as per Subject GAIS while not a single patient had worsening of lesions as per Physician GAIS.

Burning and **stinging** were experienced by 28 (90%) patients during procedure. While **persistent erythema** developed in 4 (12.9%) patients and **demarcation line** in 2 (6.06%) patients after end of the study. On Subject Global Aesthetic Improvement Scale, only one (3.03%) patient had **accentuation of pigmentation**.

DISCUSSION

The advantage of sequential peel is glycolic acid that is applied first exfoliates the skin by causing corneocyte dysadhesion and enhances the penetration of the salicylic acid leading to greater depth of peel. This leads to less chances of post inflammatory hyperpigmentation (especially in darker skin type).[2]

Glycolic acid is an alpha hydroxy acid with a keratolytic, moisturising and metabolic activity which decreases the cohesion between the corneocytes and cause exfoliation.[2]

Salicylic acid and glycolic acid peels are safe and well tolerated in all skin types.[3] Salicylic acid is an excellent peeling agent due to its lipophilic, comedolytic, antimicrobial and anti-inflammatory action.[2]

The cost of management of post acne hyperpigmentation is greatly reduced. A high rate of patient's satisfaction was achieved by this modality with minimal side effects. Very simple office procedure with good result and safety profile, easy availability and cost effective, with low-down time, in non-compliant patients and useful in patients not responding to medical therapy as compared to other modalities (combination peels, laser). But it is not a one-time procedure, required more than one sittings for maximum effect and prevention of recurrence.[6]

CONCLUSION

The post acne phase signifies emergence of sequelae of inflammation and clinically reflects post acne pigmentation and pigmented scars which are exaggerated in expression in dark skin types. Various peeling agents can be chosen depending on their inflammatory and safety profile on dark skin types.[5]Sequential peeling is effective in post acne hyperpigmentation. Deeper penetration of salicylic acid can be achieved by low concentration of glycolic acid with less side effects and increasing safety and efficacy.

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