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Research Article

COMPARATIVE STUDY OF GLYCOLIC ACID AND SALICYLIC ACID PEELS IN PATIENTS OF MELASMA

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ABSTRACT

Background: The management of melasma is challenging and requires a long-term treatment plan Besides HQ, other topical agents for which varying degrees of evidence for clinical efficacy exist include azelaic acid, kojic acid, retinoids, topical steroids, glycolic acid, mequinol, and arbutin. Topical medications modify various stages of melanogenesis, the most common mode of action being inhibition of the enzyme, tyrosinase. The most popular combination consists of HQ, a topical steroid, and retinoic acid. Prolonged HQ usage may lead to untoward effects like depigmentation and exogenous ochronosis. **Objective:** to know the comparative efficacy of glycolic acid peel and salicylic acid peels in cases of melasma. **Methodology:** This RCT study was conducted at skin and VD department at tertiary care medical college and hospital. Randomized trial will be conducted on total 120 patients of melasma aged 18 or older. The study participants were randomly divided into two groups. **Group A:** 35% Glycolic acid and **Group B:** 20% Salicylic acid. **Results:** When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was less in SA group. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was significantly less in SA group at 4 weeks. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was less in GA group at 12 weeks.
Conclusion: Salicylic acid as a peeling agent was found to be having higher efficacy compared to glycolic acid during first four weeks after the peeling.

Key words: comparative study, glycolic acid, salicylic acid peels, melasma

Introduction

Melasma is a human melanogenesis dysfunction that results in localized, chronic acquired hypermelanosis of the skin. It occurs symmetrically on sun exposed areas of the body, and affects especially women in menacme.[1]

The word melasma originates from the Greek root "melas", which means black, and refers to its brownish clinical presentation. The designations: "mask of pregnancy", liver spots, uterine chloasma, chloasma gravidarum, and chloasma virginum do not fully characterize the disease, nor are semantically appropriate, although the term "chloasma" (derived from the Latin chlóos and the Greek cloazein: greenish) is still used in the medical literature. [1-4]

Disease descriptions can be found in the medical literature extending as far as the reports of Hippocrates (470-360 BC). The term was used to designate a series of cutaneous melanization processes, and its worsening was reported to happen after sun exposure, fire heat, cold and skin inflammations. Many years later, Joseph Plenck, in his book "Doctrine of Morbis cutaneis" identified seven variants of melasma, which he called the Ephelis (from the Greek: small spot): solaris, ignealis, vesticario, gravidarum, hepatica, dismenorrhoealise haemorrhoidalis. [5]

The malar pattern is restricted to the malar cheeks on the face, while mandibular melasma is present on the jawline and chin. The latter is thought to occur in older individuals and may be more related to severe photo damage. [6] A newer pattern termed extra-facial melasma can occur on non-facial body parts, including the neck, sternum, forearms, and upper extremities. [7]

The management of melasma is challenging and requires a long-term treatment plan. In addition to avoidance of aggravating factors like oral pills and ultraviolet exposure, topical therapy has remained the mainstay of treatment. Multiple options for topical treatment are available, of which hydroquinone (HQ) is the most commonly prescribed agent. Besides HQ, other topical agents for which varying degrees of evidence for clinical efficacy exist include azelaic acid, kojic acid, retinoids, topical steroids, glycolic acid, mequinol, and arbutin. Topical medications modify various stages of melanogenesis, the most common mode of action being inhibition of the enzyme, tyrosinase. Combination therapy is the preferred mode of treatment for the synergism and reduction of untoward effects. The most popular combination consists of HQ, a topical steroid, and retinoic acid. Prolonged HQ usage may lead to untoward effects like depigmentation and exogenous ochronosis.[9]

Chemical peeling is a procedure, where a chemical agent of a defined strength is applied to the skin, which causes a controlled desquamation of the layers of the skin that is followed by regeneration and remodeling, with improvement in the texture and surface abnormalities. The objective of chemical peeling is to cause destruction at the required depth, followed by remodeling without scarring. [10] Salicylic acid and glycolic acid are some of the superficial agents that are reported to be safe and effective in treating melasma and post-inflammatory hyperpigmentation in skin of colour. [11]

Hence the present was planned with the objective to know the comparative efficacy of glycolic acid peel and salicylic acid peels in cases of melasma at our tertiary care centre.

Objective To study the comparative efficacy of glycolic acid peel and salicylic acid peels in cases of melasma at our tertiary care centre.

Materials and methods

Sampling technique: Simple random sampling method

Inclusion criteria:

- Patients of either sex having melasma.

- Subjects with melasma on both sides of the face.
- Subjects in general good health.
- Subject must be willing to sign consent, answer questionnaires, comply with all clinical visits and use sunscreen and sun protection.
- Subject must be willing to not apply other treatment options for melasma during the course of the study.

Exclusion criteria:

- HIV I and II
- HBsAg
- Pregnancy and lactation.
- Patients on immunosuppressive therapy.
- Patients with systemic illness like uncontrolled diabetes, hypertension and mental disorders and malignancy.
- Active bacterial infection.
- Active herpes simplex and herpes labialis.
- Viral warts or molluscum contagiosum on the area to be peeled.
- Open wounds.
- Uncooperative patients.
- History of abnormal scarring, atrophic skin and isotretinoin use in last six

Variables used in study: Age, gender, MASI score, peeling agents, outcome etc.

Methods of data collection:

Randomized trial will be conducted on total 120 patients of melasma aged 18 or older. The study participants were randomly divided into two groups.

Group A: 35% Glycolic acid and **Group B:** 20% Salicylic acid

Only motivated patients, who were willing to undergo the procedure of chemical peels and gave an informed consent, comprised the study subjects. Pregnant or nursing women, patients with hypersensitivity to the formulations, patients on any concurrent therapy, systemic illness, and history of herpes labialis, keloidal tendencies, unrealistic expectations, and women on oral contraceptives were excluded from study. All patients were told about the risks of the procedure and a written informed consent was obtained from all patients before the procedure. precipitating, and exacerbating factors as well as family history was taken. Melasma was clinically classified into malar, centrofacial, and mandibular types and Woods light examination was used to categorize it into epidermal, dermal, mixed, and apparent types. In all patients, skin typing was done according to Fitzpatrick classification. A postauricular test peel was performed in all patients to determine any hypersensitivity to the ingredients of the peeling agent. Melasma area and severity index (MASI) score was evaluated by a blinded clinical investigator at baseline and before each peeling session.

The session will be repeated every 2 weeks for a total of six treatments. MASI score was assessed at 0, 2^{nd} week, 4^{th} week, 6^{th} week, 8^{th} week, 10^{th} week and 12^{th} week. Priming is essential for at least 2 weeks prior to the procedure with sunscreen and topical retinoids.

Topical retinoid is used to thin the stratum corneum and to enhance the penetration and depth of the peeling agent's action. Pre and post photographs will be evaluated.

Statistical analysis:

Data was collected by using a structure proforma. Data was entered in MS excel sheet and analysed by using SPSS IBM USA. Qualitative data was expressed in terms of proportions Quantitative data was expressed in terms of Mean and Standard deviation Association between two qualitative variables was seen by using Chi square/ Fischer's exact test Comparison of mean and SD between two groups was done by using paired t test to assess whether the mean difference between groups is significant or not Descriptive statistics of each variable was presented in terms of Mean, standard deviation, standard error of mean. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant.

Results

Table 1: Distribution according to age group

		GA		SA	
		Frequency	Percent	Frequency	Percent
Age group in years	< 30	12	20.0	11	18.3
	31-40	18	30.0	19	31.7
	41-50	14	23.3	18	30.0
	51-60	12	20.0	11	18.3
	61-70	4	6.7	1	1.7
	Total	60	100.0	60	100.0

We included total 60 patients in both groups i.e. GA and SA group. In GA group, out of 60 patients, majority were from 31-40 years age group i.e. 18(30%) followed by 14(23.3%) from 41-50 years, 12(20%) each from less than 30 years and 51-60 years. In SA group, out of 60 patients, majority were from 31-40 years age group i.e. 19(31.7%) followed by 18(30%) from 41-50 years, 11(18.3%) each from less than 30 years and 51-60 years. Mean age of the patients from GA group was 42.35±10.75 years and mean age of the patients from SA group was 41.03±9.95 years.

Table 2: Distribution according to gender

		GA		SA	
		Frequency	Percent	Frequency	Percent
Gender	Male	21	35.0	21	35.0
	Female	39	65.0	39	65.0
	Total	60	100.0	60	100.0

Proportion of males were 35% and that of females were 65% in each group

Table 3: Comparison of baseline MASI score between GA and SA

Group		N	Mean	Std. Deviation	t	p	Inference
Baseline MASI	GA	60	19.83	2.41	13.419	0.0001	Highly significant
	SA	60	14.04	2.32		(<0.001)	

Baseline MASI score of patients from GA group was 19.83±2.41 and that of SA group was 14.04±2.32. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was less in SA group.

Table 4: Comparison of MASI score at 4 weeks between GA and SA

	Group	N	Mean	Std. Deviation	t	p	Inference
MASI at 4 weeks	GA	60	14.19	1.73	5.841	0.0001	Highly significant
	SA	60	11.93	2.45		(<0.001)	

MASI score of patients at 4 weeks from GA group was 14.19±1.73 and that of SA group was 11.93±2.45. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was significantly less in SA group at 4 weeks.

Table 5: Comparison of MASI score at 12 weeks between GA and SA

	Group	N	Mean	Std. Deviation	t	p	Inference
MASI at 12 weeks	GA	60	6.55	2.40	-4.397	0.0001	Highly significant
	SA	60	8.52	2.50		(<0.001)	

MASI score of patients at 12 weeks from GA group was 6.55±2.40 and that of SA group was 8.52±2.50. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was less in GA group at 12 weeks.

Discussion

We included total 60 patients in both groups i.e., GA and SA group. In GA group, out of 60 patients, majority were from 31-40 years age group i.e., 18(30%) followed by 14(23.3%) from 41-50 years, 12(20%) each from less than 30 years and 51-60 years. In SA group, out of 60 patients, majority were from 31-40 years age group i.e., 19(31.7%) followed by 18(30%) from 41-50 years, 11(18.3%) each from less than 30 years and 51-60 years. Mean age of the patients from GA group was 42.35±10.75 years and mean age of the patients from SA group was 41.03±9.95 years.

Dangi S. et al[11] included 60 patients were included in the study with 54 females and only 6 males,

male: female ratio, 1:9. Maximum number of patients was in age group 31-40 year (45%). Mean age of patients in GA group was 32.77±6.88 and in LA group was 30.73±6.03 with p-value of 0.24702 making the two groups statistically comparable.

Sarkar et al[12] conducted the study with the objective to compare the therapeutic efficacy and tolerability of glycolic acid (35%) versus salicylic mandelic (SM) acid and reported that

32 patients were from 31-40 years, 27 from 21-30 years, 7 from less than 20 years, 5 from 41-50 years age group. Mean age was 31.54 years. Females were predominant (61) compared with males (11).

Comparison of MASI score and efficacy

In our study, baseline MASI score of patients from GA group was 19.83±2.41 and that of SA group was 14.04±2.32. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was less in SA group.

In our study, MASI score of patients at 4 weeks from GA group was 14.19±1.73 and that of SA group was 11.93±2.45. When we compared the baseline MASI score between two groups, the difference was found to be statistically significant ($p<0.05$). It means MASI score was significantly less in SA group at 4 weeks. So in our study, SA was significantly better than GA group.

Dangi S. et al[11] assessed the response of peeling in both groups. They reported that up to 2 week (1 peel) there was no significant response in both the groups ($p>.05$). After 12 weeks, reduction in MASI was 54% (from 22.29 to 10.12) in GA group and 68% (from 22.15 to 6.91) in LA group which was highly significant ($p<.001$).

Sarkar et al[12] conducted the study with the objective to compare the therapeutic efficacy and tolerability of glycolic acid (35%) versus salicylic mandelic (SM) acid and reported that the average MASI score in the GA group A decreased from 12.59±7.58 at baseline to 4.56±2.98 at 12 weeks and 7.28±3.890 at 20 weeks. This represents a change of 62.36% at 12 weeks and 39.38% at 20 weeks. In the SM acid Group B, the average MASI score decreased from 11.85±7.4 at baseline to 4.37±3.01 at 12 weeks and 6.52 at 20 weeks, which represented a 60.98%, and 41.67% change, respectively. **Sarkar et al[12]** when compared these two groups, they found that mean MASI in GA group at baseline was 12.59±7.58 and in SA group was 11.85±7.4., at 4 weeks it was 8.94±4.91 in GA and 9.17±5.09 in SA, at 8 weeks it was 6.35±3.47 in GA group and 6.43±4.33 in SA group, at 12 weeks it was 4.56±2.98 in GA and 4.37±3.01 in SA group, at 16 weeks it was 5.44±3.09 in GA and 5.37±3.70 in SA group. They finally stated that there was no statistically significant difference between Groups A and B ($p = .876$) i.e. GA and SA group which is not consistent with our findings.

Grimes et al[13] treated 25 patients from a darker racial ethnic group who had acne vulgaris, melasma, or post-inflammatory hyperpigmentation with 20% and 30% SA peels, and reported good efficacy with minimal side effects.

Although a number of new agents have come up, there is little published evidence supporting their use in day-to-day practice and the choice becomes relatively limited when you are treating a patient with a Fitzpatrick skin type IV or above. Superficial peels which include glycolic acid, salicylic acid (SA), Jessner solution, and trichloroacetic acid (TCA) peels, with appropriate titration of concentrations are generally safe and efficacious for Fitzpatrick skin type IV to VI. There are very few objective published studies comparing the efficacy and safety of different chemical peels for melasma in type IV and V skin.[12]

Conclusion: Salicylic acid as a peeling agent was found to be having higher efficacy compared to glycolic acid during first four weeks after the peeling.

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