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EFFECT OF ARGININE PEEL 20 % VS LACTIC ACID 15% PEEL IN THE TREATMENT OF PERIORBITAL HYPERPIGMENTATION IN PATIENTS ATTENDING THE DERMATOLOGY OUTPATIENT DEPARTMENT OF A TERTIARY CARE HOSPITAL: AN INTERVENTIONAL STUDY

Dermatology

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ABSTRACT

Background: Periorbital melanosis (POM) is a common aesthetic condition with significant impact on quality of life. Though chemical peeling is a frequently used treatment, an ideal peeling agent is yet to be found. **Objective:** To evaluate and compare the clinical efficacy and safety of Arginine peel 20% and Lactic acid 15% peel in the treatment of POM. **Materials and Methods:** Patients with POM were divided into Group 1 (Gr-1) and Group 2 (Gr-2), who received 20% Arginine peeling and 15% Lactic Acid peeling respectively; every 2 weeks, for 6 sessions and evaluated after each session. Clinical improvement using POM grading, patients' global assessment, satisfaction, and physician's global satisfaction were noted. Data was presented in number, percentages and mean±standard deviation. INSTAT software was used for statistical analysis; **Results:** A total of 30 patients were enrolled in the study with 15 patients in Gr-1 and 15 patients in Gr-2. The Mean ± S.D of age of patients enrolled was 32.13 ± 6.04 years with similar baseline POH grade and skin types. Mean satisfaction score was progressively increasing in a much better way with each peeling with lesser adverse effects for Gr-1 than Gr-2. **Conclusion:** 20% Arginine peel appears to be better than 15% Lactic Acid peel with earlier, more consistent results and fewer side effects.

KEYWORDS

INTRODUCTION

Periorbital hyperpigmentation (POH) is a condition characterised by bilateral, homogenous, hyperchromic macules and patches around the eyes. It makes a person look fatigued and dull, and cause significant impairment of quality of life, especially in women. In spite of being a common aesthetic condition, there is no definite treatment modality yet. The available treatment options include topical depigmenting agents like hydroquinone, kojic acid, azelaic acid, topical retinoic acid and physical therapies like chemical peels, laser therapy, autologous fat transplantation, injectable fillers, surgery (blepharoplasty).

Chemical Peeling is a medical procedure which causes controlled skin damage, thereby promoting regeneration and rejuvenation of tissues. It not only reduces the hyperpigmentation but also improves the texture of the skin and wrinkling of the skin. The superficial peeling agents facilitate progressive weakening of cohesion of the intercellular material of the stratum corneum, resulting in regular exfoliation of its outermost layers of the skin. The α-hydroxy acids (AHA) like lactic acid is one such superficial peel, which is popular and well established in dermatological practice. Low strength lactic acid (LA) has the properties of an AHA with a moisturizing effect. This makes it one of the safest peel for periorbital region and strength of up to 30% to 50% can be used in the face. LA facilitates desquamation, dispersion of melanin, and has tyrosinase inhibiting action, enabling it an ideal agent to be used either alone or in combination with other peels for its skin lightening effects.

Arginine (2-amino 5-guanidino-pentanoic acid) is a basic amino acid which acts on the stratum corneum and has moisturizing, anti-ageing and antibacterial benefits. The fact that arginine has a pH of 4-6 with very slow epidermal penetration, makes it is an excellent agent for treatment of POH in patients with dry, sensitive and irritable skin. Though arginine has been used extensively for its skin rejuvenating properties, there have been very few research papers highlighting its use in improving POH.

AIM AND OBJECTIVE:

To evaluate and compare the clinical efficacy and safety of Arginine peel 20% and Lactic acid 15% peel in the treatment of POM.

MATERIALS AND METHOD:

Following the approval from the institutional ethical committee, the study was started. Patients with POH and skin types II, III, or IV were included in the study after their informed consent. They were divided into two groups using simple random sampling method. Group 1 (Gr-1) patients received 20% arginine peel and group 2 (Gr-2) received 15% lactic acid peel. Each of the groups were treated for 6 sessions in total, with an interval of 2 weeks between two successive sessions. The effect was photo-documented. Clinical improvement using POH grading, patients' and physicians' global satisfaction were noted. The data were presented in number, percentages and mean ± standard deviation.

Inclusion Criteria:

Patients ≥ 18 years with Peri orbital hyperpigmentation who give consent for the study.

Exclusion Criteria-

Patients who refused to provide consent for the study, as well as those with inflammation or infections in the periorbital region, systemic diseases, or those who had undergone other treatments (such as dermabrasion, laser therapy, radiation, or surgery) on the affected area within six months prior to the study's initiation. Additional exclusion criteria included pregnancy, breastfeeding, hypersensitivity to any components, and photosensitivity.

The Sheth et al. scale was utilized for severity grading, which ranges from zero to four:
0: Skin color comparable to the surrounding facial skin
1:Faint pigmentation or color change in the infraorbital fold
2: more pronounced pigmentation or change in color of the infraorbital fold;
3: deep dark pigmentation or change in color, all four eyelids;
4: grade 3 with pigmentation or change in color spreading beyond eyelids.

Ranu et. Al scale was used to diagnose the subtype of peri-orbital hyperpigmentation as either constitutional, post-inflammatory, vascular, shadow effects, or other (acanthosis nigricans, skin laxity, anemia).

The patient proforma consisted of a structured questionnaire that included demographic details, relevant history regarding the complaint, and other medical history. The safety profile was assessed based on the side effects reported.

The treatment efficacy was evaluated by assessing patient satisfaction and the degree of improvement determined by the investigator. The clinical response to treatment for each patient was assessed by comparing digital photographs taken before (baseline) and after treatment, as reviewed by the principal investigator and co-investigators to analyze the results.

The clinical assessment of improvement in dark circles by the investigator was scored according to the following scale from 0 to 4:
(0) indicated no change in color
(1) indicated mild improvement in color (<25%)
(2) indicated moderate improvement in color (25%-50%)
(3) indicated very good improvement in color (51%-75%)
(4) indicated excellent improvement in color (>75% or normal skin color)

Upon final examination, patients were asked to score their overall satisfaction on a quartile scale: 0 for not satisfied at all; 1 for slightly satisfied; 2 for moderately satisfied; and 3 for highly satisfied.

Data Management And Analysis Procedure:
The data was collected & analyzed in Microsoft Excel 2019 by using suitable statistical computer software: Epi-Info 7.

p-value of <0.05 was considered as statistically significant and p>0.05 was considered as non-significant.

RESULT:
A total of 30 patients were enrolled in the study with 15 patients in Gr-1 and 15 patients in Gr-2. Among these patients, 11 (73%) in Gr-1 and 9 (60%) in Gr-2 completed the study till the last sitting. The mean ± S.D of age of patients enrolled was 32.13 ± 6.04 years. The baseline POH grade and skin types were similar in both groups with the predominant Fitzpatrick class in both the groups being type 4.

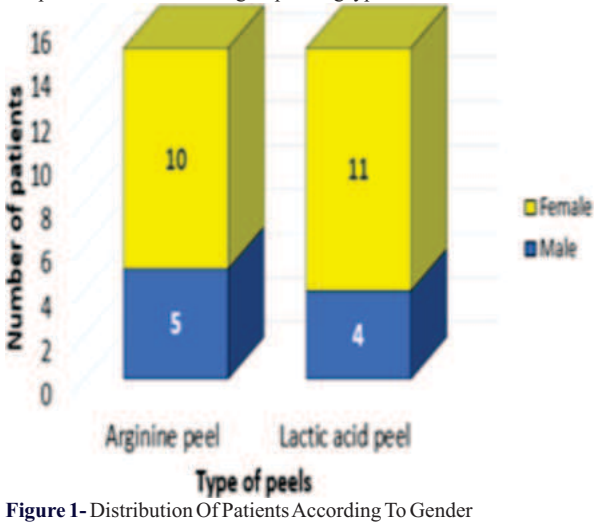

Figure 1- Distribution Of Patients According To Gender

Table 1- Distribution Of Lifestyle Factors In Both The Groups

Factors	Arginine Peel	Lactic acid peel
Hours of sleep	6.40 ± 1.50	6.50 ± 1.04
Stress present	9	7
Sun exposure	7	8
<1 hr	3	6
1-5 hr	4	2
Cosmetic use	8	10
Current smoker	3	2
Alcohol consumption	2	1

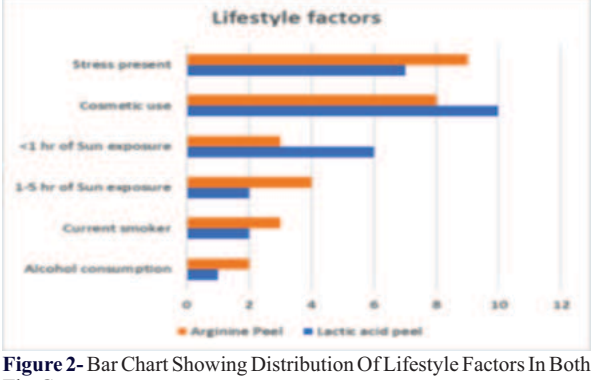

Figure 2- Bar Chart Showing Distribution Of Lifestyle Factors In Both The Groups

Table 2 – Significant Medical History Related To POH In Both Groups

Factor	Arginine Peel	Lactic acid peel
Allergies	7	8
Eczema	6	3
Seborrheic dermatitis	2	4
Pregnancy	6	5
Birth control pills	5	3

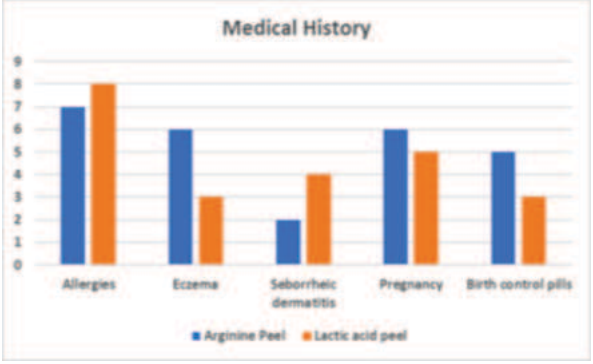

Figure 3 - Significant medical history related to POH in both groups

Table 3: Distribution Of POH Related Factors In Both Groups

Factor	Arginine Peel	Lactic acid peel
Duration of problem (years)	2.73 ± 1.32	3.14 ± 1.56
Premenstrual flare	7	6
Previous treatment	12	13
Home remedies	6	6

Table 4: Severity Grading In Both The Groups

Severity Grade	Arginine Peel	Lactic acid peel
II	8	5
III	7	10

Table 5: Subtype Grading In Both Groups

Subtype Grade	Arginine Peel	Lactic acid peel
Constitutional	8	7
PIH	7	8

Patients in Gr-1 had lesser adverse events than their counterparts, and the common adverse events noted were itching, burning, pain and erythema. Mean satisfaction score was progressively increasing much better with each peeling for Gr-1 than Gr-2.

Figure 4 : Before and after treatment with Arginine 20% peeling

Figure 5: Before and after treatment with Lactic Acid 10 %peeling

Table 6: Assessment At The End Of Sixth Sitting

Physician assessment	Arginine peel (n=11)	Lactic acid peel (n=9)	p value
Fair	5	6	0.3109 (Fisher's exact)
Good	6	3	
Patient assessment	**n=11**	**n=9**	**p value**
Poor	1	1	0.6312 (Fisher's exact)
Fair	4	5	
Good	6	3	

Table 7: Adverse Effects Felt By Patients After The Procedure

Adverse events	Arginine peel	Lactic acid peel	p value (Fisher's exact)
Itching	3	7	0.1225
Burning	4	7	0.50
Pain	2	5	0.1949
Erythema	6	11	0.0697

DISCUSSION:

It was observed that more number of female patients consulted the outpatient department for treatment of dark circles (70%). The same was also observed in the studies by Ahmed et al. (63%) and Sheth et. al. (81%). Better improvement was seen with arginine peel than the lactic acid peel. At end of treatment, physician's and patient's assessments were compared and they were not significant for both physician (p = 0.3109B) and patient (p = 0.6312). Similar results were obtained by Ranjan et. al. and Hassan et. al. Although not statistically significant, lactic acid peel had more adverse effects. This was in contrast to findings of Ranjan et. al. or Ahmed et. al.

CONCLUSION:

Both 20% arginine peeling and 15% lactic Acid peeling are useful in aesthetic treatment of patients with Periorbital Hyperpigmentation. Six sessions of 20% arginine peeling appears to be better than 15% lactic Acid peeling used at 2 weeks apart. Also, Arginine peeling showed more favorable results which appeared earlier and were more consistent, along with fewer side effects. It was also noted that patients who made lifestyle changes tended to have a better overall response. This underscores the impact of lifestyle factors on the outcomes of chemical peeling.

Conflict Of Interest - None

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