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# PEELING AWAY SHADOWS: A COMPARATIVE ANALYSIS OF 20% GLYCOLIC ACID AND 30% LACTIC ACID FOR PERIORBITAL MELANOSIS IN ADULTS AT A TERTIARY CARE HOSPITAL

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**ABSTRACT** **Background:** Periorbital melanosis, is a multifactorial condition affecting both genders of all ages. Though there is a platter of treatment options , often patients are left dissatisfied. This study compares 20% glycolic acid peel with 30% lactic acid peel pertaining to response and side effect profile . **Aims & Objectives:** The aim of this study was to assess the outcome of 20% glycolic acid versus 30% lactic acid peel in periorbital melanosis among patients above 18 years and below 60 years attending the dermatology out-patient department. **Materials & Methods:** This was a cross-sectional study conducted in the Skin Outpatient Department (OPD) of a tertiary care hospital on patients clinically diagnosed with periorbital melanosis, aged between 18 and 60 years. The sample size for the study was 126 patients selected through purposive sampling, and the patient were randomly divided into two groups (one group underwent 20% glycolic acid (GA) peel (Gr-G), while the other group underwent 30% lactic acid (LA) peel (Gr -L)), with 63 patients in each group. Both groups underwent 6 sittings at 2-week intervals, with respective agents. **Results:** Based on the findings in our study, the inference was that 30% lactic acid was better for treating periorbital melanosis than 20% glycolic acid and this could be attributed to minor smoothening out of wrinkles secondary to the moisturizing effect of lactic acid, in addition to the regular periodic reduction of the periorbital melanosis and minimal side effects. **Conclusion:** Periorbital melanosis is an important cosmetic concern and remains one of the difficult cases to treat in dermatology. The authors through this study hope to shed light on the effects of chemical peeling using glycolic acid and lactic acid and the feasibility of these options among the armamentarium of treatment options already available for periorbital melanosis.

**KEYWORDS :**

## INTRODUCTION

Periorbital melanosis is a complex condition that impacts individuals of all ages and genders. Despite a variety of treatment options, patient satisfaction is often elusive. The first mention of this issue dates back to 1937 when Touraine et al. suggested that protruding arteries, resulting from the loss of subcutaneous fat and muscle tone in the orbital region, could be a contributing factor to periorbital melanosis (POM). While both genders can be affected, women in the Asian population are more commonly affected [1].

This pigmentation concern can be categorized into primary and secondary forms. The primary type, also known as ICHOR (Idiopathic Cutaneous Hyperchromia of the Orbital Region), manifests as bilateral, non-systemic darkening of the orbital skin. On the other hand, the secondary type encompasses various factors such as excessive pigmentation, post-inflammatory hyperpigmentation (linked to conditions like atopic and allergic contact dermatitis), periorbital edema, increased subcutaneous vascularity, shadowing laxity of the skin, and age-related tear trough, contributing to its multifactorial pathophysiology [2].

In clinical practice, periorbital pigmentation is further classified into constitutional, post-inflammatory, vascular, and shadow effect types, with underlying causes including hormonal disturbances, anemia, acanthosis nigricans, nevus of ota, dietary deficiencies, chronic illness, and stress [2,3]. While there is limited statistical data on treatment options for periorbital melanosis, the abundance of market products aimed at lightening and concealing underscores the significance of this condition to affected individuals.

## METHODOLOGY

This randomized study was conducted at the Skin Outpatient Department (OPD) of a tertiary care hospital, focusing on patients clinically diagnosed with periorbital melanosis, aged between 18 and 60 years. Exclusion criteria included patients unwilling to undergo the procedure, those predisposed to keloid formation, individuals with active herpes infection or any other ongoing infection, pregnant and lactating mothers, patients with concurrent dermatological conditions like atopic dermatitis or acanthosis nigricans, and those with vascular-type periorbital melanosis.

After applying the inclusion and exclusion criteria, a total of 126 patients with constitutional periorbital melanosis were enrolled in the study. They were then divided into two groups: one group underwent a 20% glycolic acid (GA) peel (Gr-G), while the other group underwent a 30% lactic acid (LA) peel (Gr-L), with 63 patients in each group. Both groups underwent six sessions at two-week intervals, with the respective peeling agents applied for three minutes and neutralized with ice-cold water. Observations were recorded at two-week intervals, and clinical improvement was objectively assessed using the POM grading system. Data for the study were collected through descriptive analysis, and data entry and analysis were conducted using MS Excel and SPSS 22 version, respectively.

## RESULTS:

In this study, a predominant portion of the participants fell within the 21-30 age group (Figure 1). Notably, the majority of individuals expressing concern about the condition were females, constituting 80% in the lactic acid group and 60% in the glycolic acid group (Figure 2).

There was no significant difference observed between patient grading and clinical grading. Both glycolic and lactic acid peels demonstrated improvement from baseline, with glycolic peel showing a mean improvement from grade 3 to grade 2.8 by the third sitting, while lactic acid exhibited a mean improvement from grade 4 to grade 3.5 at the third sitting. However, after 6 sessions, lactic acid peel outperformed glycolic acid, reducing the grade from 3.5 at the fourth sitting to 1.9 after the last sitting, whereas the glycolic acid group showed a mean improvement from grade 2.8 to grade 2.6 after the last sitting (Figure 3).

Although a significant association was found between subjective improvement of pigmentation when comparing the two groups, the lactic acid group demonstrated greater improvement over time with a p-value of 0.9. Despite glycolic peel showing quicker action against the patient's problem compared to lactic acid peel, the latter group exhibited a considerably greater and satisfying effect for both patients and doctors (Figure 4). This satisfaction was attributed to the minor smoothening of wrinkles brought about by the moisturizing effect of lactic acid, in addition to the regular reduction of periorbital melanosis. While the peeling treatment was well-tolerated by patients, a small number of individuals in the glycolic group reported side effects, including erythema (1%), burning sensation (10%), tearing (5%), pain

(1%), transient darkness (1%), and scaling (3%). In contrast, lactic acid peel demonstrated minimal side effects, with 5% of patients experiencing them (Figure 5, 7).

## DISCUSSION

Both glycolic and lactic acid peels operate through a similar mechanism, reducing corneocyte cohesion, leading to the sloughing of dead cells and stimulating the growth of the basal layer. It was observed that women were more inclined to seek treatment than men, with the majority of patients falling in the 21 to 30 years age group in both the glycolic and lactic acid groups. In a study by Ahmed et al., the mean age was reported to be 32.42 years in the glycolic acid group and 30.35 years in the lactic acid group, with a female preponderance [5].

Periorbital melanosis can be influenced by various lifestyle and physiological factors. Family history was present in 12.5% of participants in this study, differing from the findings of other studies reporting family history in 22% and 48% of patients. Stress was reported by nearly half of the participants (47.5%), aligning with the studies reporting stress in 32% and 70% of the population. Significant sun exposure was reported in 24.5% of patients in this study, comparable to the 26% reported in another study [5,6].

When comparing the two peels from the first to the sixth sessions in this study, a significant difference in pigmentation was observed, with lactic peel showing a better mean change compared to glycolic peel [7]. This aligns with the findings of Ahmed et al., who reported slightly better improvement in the lactic acid group, with better satisfaction among physicians and patients. However, Dayal et al. reported maximum clinical improvement with glycolic acid peel in contrast to our study, potentially due to differences in the size and penetrability of glycolic acid molecules [8].

According to Ahmed G et al., both groups showed progressive improvement in pigmentation, but improvements following glycolic acid peel were lower compared to lactic acid peels, consistent with the current study. Although both peels were well-tolerated, complications were more prevalent in the glycolic acid group, including side effects like burning, erythema, tearing, pain, transient darkness, and scaling. These findings align with Dayal et al., where maximum side effects were seen with glycolic acid peel, possibly due to its deeper penetration [9].

In a research conducted by Surabhi et al [10], it was observed that over 50% improvement in POM (Patient Outcome Measure) occurred in 73.34% of individuals treated with GA peel, 56.67% with lactic peel, and 26.67% with vitamin C. When considering the duration of therapy, GA peel exhibited significantly greater efficacy than lactic peel starting from 12 weeks onward. Additionally, GA peel was more effective than vitamin C from 6 weeks onward. Lactic peel demonstrated superior effectiveness compared to vitamin C from 6 weeks onward. Both physicians and patients reported excellent global assessments for glycolic peel, followed by lactic peel and vitamin C [11]. However, the incidence of adverse effects was highest with GA peel, followed by lactic peel and vitamin C.

Ohshima et al. [12] demonstrated that vitamin C and its derivatives, including magnesium ascorbyl phosphate and ascorbic acid glucoside, have the ability to inhibit melanogenesis in human melanocytes. In their study, two types of 10% vitamin C lotions, namely sodium ascorbate and ascorbic acid glucoside, were applied in a split-faced manner for six months to address dark circles.[13] The researchers measured the melanin index, erythema index, thickness, and echogenicity of the dermis of the bilateral eyelid. The results indicated a lightening of pigmentation attributed to an increase in dermal thickness, concealing dark discoloration resulting from congested blood [14]. However, there was no significant difference observed in the melanin index [15].In conclusion, based on the observations, it can be inferred that 30% lactic acid is more effective for treating periorbital melanosis than 20% glycolic acid (Table 5).

## CONCLUSION

Periorbital melanosis poses a significant cosmetic concern and remains a challenging condition in dermatology. This study highlights the efficacy of chemical peeling, providing valuable insights into a well-tolerated treatment with high patient compliance and minimal side effects. By exploring the effects of chemical peeling, specifically using glycolic acid and lactic acid, this research contributes to the growing array of treatment options available for periorbital melanosis. The authors aim to illuminate the potential benefits and feasibility of these chemical peels, offering new perspectives in the quest for effective solutions to address this cosmetic concern.

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**Funding :**nil


**Figure:1**

| | Gr-G (n=60) | Gr-L (n=60) | |
|---|---|---|---|
| Complications | % | % | RR (95% CI) |
| Erythema | 1 | 0 | 0.7 (0.17–1.32) |
| Burning | 10 | 5 | 0.6 (0.51–1.47) |
| Tearing | 5 | 0 | 0.0 |
| Pain | 1 | 0 | 0.0 |
| Transient darkness | 1 | 0 | 0.0 |
| Scaling | 3 | 1 | 0.4 (0.029–1.93) |

**Figure:3**


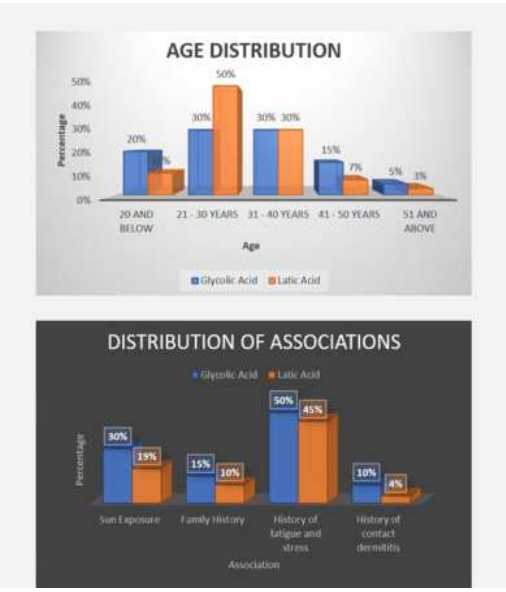


**Figure:4**

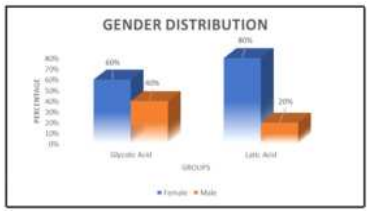


**Figure:5**

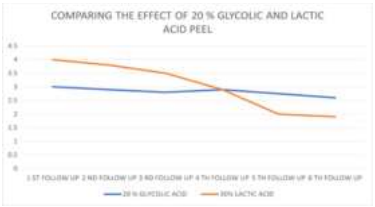


**Figure:6**


**Figure:7**

## REFERENCES:


1. Touraine A. Dermatoses: Symptomatic visceral lesions. Surgical Medical Encyclopedia. Dermatology.1937; 2:14.
2. Sheth PB, Shah HA, Dave JN. Periorbital hyperpigmentation: a study of its prevalence, common causative factors and its association with personal habits and other disorders. Indian J Dermatol. 2014;59:151.
3. Sarkar R. Idiopathic cutaneous hyperchromia at the orbital region or periorbital hyperpigmentation. J Cutan Aesthet Surg. 2012;5:183-4.
4. Verschoore M, Gupta S, Sharma VK, Ortonne JP. Determination of melanin and haemoglobin in the skin of idiopathic cutaneous hyperchromia of the orbital region (ICHOR): a study of Indian patients. J Cutan Aesthet Surg. 2012;5:176.
5. Lahiri K, Chatterjee M, Sarkar R, editors. Pigmentary disorders: a comprehensive compendium. JP Medical Ltd; 2014.
6. Alsaad SM, Mikhail M. Periocular hyperpigmentation: a review of etiology and current treatment options. J Drugs Dermatol. 2013;12:154-7.
7. Ahmed G, Mishra DK. Clinical efficacy and safety of 20% glycolic acid versus 30% lactic acid peel in constitutional type of periorbital melanosis: a comparative study. Int J Res Dermatol. 2019;5:546-53.
8. Ranjan R, Sarkar R, Garg VK, Gupta T. A Comparative Study of Two Modalities, 4% Hydroquinone Versus 30% Salicylic Acid in Periorbital Hyperpigmentation and Assessment of Quality of Life Before and After Treatment. Indian J Dermatol. 2016;4 :413-7.
9. Dayal S, Sahu P, Jain VK, Khetri S. Clinical efficacy and safety of 20% glycolic peel, 15% lactic peel, and topical 20% vitamin C in constitutional type of periorbital melanosis: a comparative study. J Cosmet Dermatol. 2016;4:367-373
10. Roh MR, Chung KY. Infraorbital dark circles: definition, causes, and treatment options. Dermatol Surg 2009; 35: 1163–71.
11. Naglaa A Ahmed, Salma S Mohammed, Mohammad I Fatani, Treatment of periorbital dark circles: Comparative study of carboxy therapy vs chemical peeling vs mesotherapy, Journal of Cosmetic Dermatology, 10.1111/jocd.12536, 18, 1, (169-175), (2018).
12. Kachiu C. Lee, Carlos G. Wambier, Seaver L. Soon, J. Barton Sterling, Marina Landau, Peter Rullan, Harold J. Brody, Basic chemical peeling: Superficial and medium-depth peels, Journal of the American Academy of Dermatology, 10.1016/j.jaad.2018.10.079, 81, 2, (313-324), (2019).
13. Peter P. Rullan, Chemical Peelings in the Periorbital Region, Periorbital Rejuvenation, 10.1007/978-3-030-46866-8_6, (119-130), (2020).
14. Khaled El Hoshy, Mona El-Kalioby, Periorbital Dermatology and Oculoplasty, Oculoplastic Surgery, 10.1007/978-3-030-36934-7_32, (345-379), (2020).
15. Kameyama K, Sakai C, Kondoh S et al. Inhibitory effect of magnesium 1-ascorbyl-2-phosphate (VC-PMG) on melanogenesis in vitro and in vivo. J Am Acad Dermatol 1996; 34: 29–33.