



A COMPARATIVE STUDY OF 20% GLYCOLIC ACID-PEEL VS PLATELET RICH PLASMA (PRP) THERAPY IN MELASMA PATIENTS

Dermatology

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ABSTRACT

Introduction: Melasma is a common disorder of facial hyperpigmentation among Asian women. Contributing factors include genetic predisposition, UV exposure, hormonal changes and certain medications. Multiple treatment options are available but none is satisfactory. **Aim:** This study was undertaken to see efficacy and safety of 20% Glycolic acid (GA) peel versus Platelet rich plasma therapy (PRP) in Melasma Patients. **Materials and Methods:** The study employs an Analytical design. 80 patients were recruited from the OPD after taking informed written consent meeting the inclusion and exclusion criteria. Patients were divided into 2 groups. Group 1 receiving PRP therapy and group 2 undergoing 20% GA peel. Each group undergoes 4 sessions spaced 4 weeks apart & 2 separate follow up were done after the treatment. Key outcome measures include changes in Melasma area and severity index (MASI) score and recording any side effect at each visits and the followups. **Result:** A significant improvement in MASI from baseline to 24th week was observed in both groups, with Group 2 showing more reduction as compared to Group 1. Reduction in MASI in Group 1 was from 16 ± 2.2 to 8.9 ± 0.52 and in Group 2 was 17.2 ± 2.1 to 6.92 ± 2.2 at 24th week. Side-effect profile associated in both groups was erythema, acne, post-inflammatory hyperpigmentation and rebound hyperpigmentation and is more in group 2. **Conclusion:** Both the treatment options are effective in reducing Melasma however, GA showed superior results as compared to PRP therapy group.

KEYWORDS

Melasma, Platelet rich plasma therapy, Glycolic acid peel, MASI Score, PIH

INTRODUCTION

Hypermelanosis on the face and neck is a frequently encountered condition, particularly among individuals of Indian descent. This condition can have a notable effect on their overall well-being and daily life. Melasma is a common condition that affects people worldwide.¹ It is more common in women, particularly during their reproductive years, although men can also experience it. This condition is frequently observed in people with darker skin tones who reside in areas with high levels of sun exposure.² Even though melasma may not pose a direct risk to physical health, its visible appearance can significantly affect the psychological and emotional well-being of those who experience it.^{3,4} The occurrence of melasma can vary significantly among various geographical regions and ethnic populations.

Studies have found that melasma can impact a significant portion of the population, with higher rates observed among individuals of Asian, African, and Middle Eastern population.⁵ The condition is impacted by various factors some of which are genetic predisposition, exposure to ultraviolet (UV) radiation, changes in hormones during pregnancy and the OCP use, and thyroid disease. Women experience a significantly higher impact compared to men. Melasma is not commonly seen before puberty, but it becomes more prevalent during the reproductive years. A significant number of pregnant patients experience melasma. The prevalence can vary significantly, ranging from 1.5% to 33%, depending on the specific population being studied. Research comparing different treatments, like the study on glycolic acid peels and PRP therapy, plays a vital role in improving our knowledge and treatment options for melasma.

Our study aims to conduct a comparative evaluation of the effectiveness and therapeutic outcomes between 20% Glycolic Acid Peel and Platelet Rich Plasma therapy in the management of Melasma patients. This study aims to fill this gap by systematically comparing the outcomes, side effects and overall effectiveness of these treatments, thereby providing a clearer direction for clinicians in the management of Melasma.

MATERIAL AND METHODOLOGY

This analytical study was conducted in the dermatology Outpatient Department (OPD) at Rajshree Medical Research Institute, Bareilly, over a period of one year. Patients meeting the inclusion criteria were

randomly assigned to either Group 1, receiving PRP therapy, or Group 2, undergoing 20% glycolic acid peel sessions.

Data on demographic characteristics, melasma status, and treatment outcomes were collected.

Inclusion Criteria:

1. **Age:** Participants aged 18 years and above.
2. **Willingness to Participate:** Patients who give consent to be part of the study were included.

Exclusion Criteria:

1. History of Herpes Simplex
2. Psychiatric Disorders
3. Active Acne or Keloidal Tendency
4. Bleeding Tendency
5. Recent Melasma Treatment.

Ethical considerations were strictly adhered to, including obtaining informed consent from all participants and ensuring confidentiality of personal health information. Ethical approval was obtained from the appropriate Institutional Review Board. Statistical analyses, including paired t-tests for within-group improvements, ANOVA for between-group comparisons, and chi-square tests for adverse effects, were employed. Non-inferiority or equivalence testing, and multiple regression analysis, were used to adjust for potential confounding variables. Data was collected and analyzed using SPSS version 26.0, ensuring a rigorous evaluation of the comparative effectiveness and safety of 20% glycolic acid and PRP in treating melasma.

RESULT

All individuals provided written informed consent after being fully informed about the aim, design, and methodology of the study. Total 88 enrolled, 3 of them could not be followed up, 5 refused to give consent. A total of 80 patients were divided in 2 groups, assessed and followed. Total females were 77 (39 in group 1 and 38 in group 2) and 3 males (1 in group 1 and 2 in group 2). In Group 1, 12.5% of participants are under 18-25 years old, 50% are aged between 25 and 35, and 37.5% are over 35. Conversely, in Group 2, 7.5% of participants are under 18-25, 62.5% are aged between 25 and 35, and 30% are over 35.

Table 1: Distribution Of Study Population Based On Sex

Characteristic	Group 1 Frequency (Proportion)	Group 2 Frequency (Proportion)	T Value	P value
Male	1 (2.5%)	2 (5%)	2.35	0.561
Female	39 (97.5%)	38 (95%)	2.76	0.432
Grand Total	40 (100%)	40 (100%)		

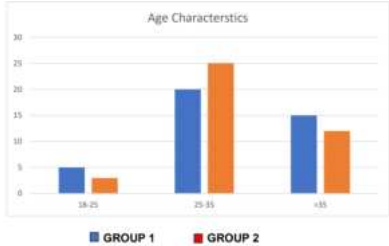


Figure 1 Distribution of study population based on age

Occupation Status:

In Group 1, comprising individuals treated with PRP, 5 (12.5%) of the participants are professionals, while 22(55%) patients identify as homemakers, 6 (15%) are students and rest were unskilled workers. Comparatively, in Group 2, the distribution shifts slightly with 6 (15%) of participants being professionals, 26 (65%) identifying as homemakers, 3(7.5%) as students and rest were unskilled workers.

Table 2: Distribution Of Study Population Based On Occupation Status

Occupation	Group 1 Frequency (Proportion)	Group 2 Frequency (Proportion)
- Professional	5 (12.5%)	6 (15%)
Unskilled worker	7 (17.5%)	5 (12.5%)
Unemployed		
A) Homemaker	22 (55%)	26 (65%)
B) Students	6 (15%)	3 (7.5%)
Grand Total	40 (100%)	40 (100%)

Percentage Reduction in Masi Scores:

The data illustrates the percentage reduction in MASI scores over different time points for both the treatment groups: Group 1 receiving PRP Therapy and Group B undergoing a 20% Glycolic Acid Peel. At each time point, both groups exhibit reductions in MASI scores, indicating improvements in melasma severity. Over the course of 24 weeks, Group 1 shows consistent reductions ranging from 11.26% at 4 weeks to 50.28% at 24 weeks. In comparison, Group 2 demonstrates slightly higher reductions, ranging from 14.28% at 4 weeks to 59.89% at 24 weeks. Overall, both treatment modalities lead to significant reductions in MASI scores over time, with Group 2 experiencing slightly higher percentage reductions compared to Group 1 across all time points.

Table 3: Percentage Reduction In Masi Scores:

Time Point	Group 1	Group 2
4 weeks	11.26%	14.28%
8th week	18.38%	21.52%
12th week	28.38%	32.36%
16th week	37.42%	42.67%
20th week	46.86%	48.29%
24th week	50.28 %	59.89%

Comparative Analysis of Treatment Outcome

Table 4: Comparative Analysis of Treatment Outcomes

Time Point	Group 1	Group 2	t-test	p-value
Baseline	16.3 ± 2.2	17.22 ± 2.1	1.22	0.431

4 weeks	14.02 ± 2.20	13.56 ± 3.32	3.21	0.003
8th week	12.52 ± 1.56	11.23 ± 1.26	4.89	0.001
12th week	10.02 ± 1.8	9.52 ± 0.53	5.67	<0.001
16th week	9.83 ± 2.32	8.23 ± 1.56	6.32	<0.001
20th week	9.42 ± 0.32	7.90 ± 1.23	7.45	<0.001
24th week	8.90 ± 0.52	6.92± 2.23	8.21	<0.001

Glycolic Acid Peel Results



At Base Line

After 24 Weeks

Platelet Rich Plasma (prp) Therapy Results



At Base Line

At 24 Weeks

DISCUSSION

Melasma is a frequently encountered pigmentary condition that presents as dark patches on the face, primarily affecting women in their reproductive years. Even while the precise etiology of melasma is still unknown, a number of factors have been associated to its development including inflammation, sun exposure, hormone imbalances and heredity. Management of melasma poses a clinical challenge due to its chronic nature and tendency for recurrence. Treatment modalities aim to reduce pigmentation, improve skin texture, and prevent relapse.

Among the therapeutic options, Platelet-Rich Plasma (PRP) Therapy and Glycolic Acid Peels have gained popularity for their potential efficacy in melasma management. This study seeks to compare the demographic profile, clinical characteristics, treatment outcomes, and patient satisfaction between individuals undergoing PRP Therapy and Glycolic Acid Peel for melasma. In our study, women are more likely to get Melasma. In comparison to 19.87% men in the study from the Eastern population of India and 4.4% in our study from Singapore, we identified Melasma in 2.5% men in Group 1 and 5% in Group 2.⁶ Occupation Status: Majority of our patients were housewives 22 (55%) in group 1 and 26(65%) in group 2. In a study conducted by Raseena et al.⁷ The majority of patients (53.5%) were housewives, followed by office workers (25.5%). However,the most prevalent occupation (65%)in a research by Yalamanchili et al. was agriculture, followed by skilled labour.

Similar to our research, Bansal et al.⁸ found that Centrofacial was the most prevalent followed by Malar and Mandibular type; however the investigations conducted by Thapa DM et al.⁹ and Akshay et al.¹⁰ that Malar was the most prevalent type, followed by Centrofacial. Sun exposure emerge as significant contributors in Group 1, 21(52.5%) and in Group 2, 19(47.5%), highlighting their role in melasma pathogenesis. Other factors such as skin irritants, medications, and cosmetics also play a role, albeit to a lesser extent. In a study conducted by Nanjundaswami et al.¹¹ 64% of patients had a significant history of

exposure to sunlight whereas in Jagannathan et al.¹² had a lower percentage of patient having history of sun exposure (22%). Melasma Based on Woods Lamp Examination: Both groups predominantly exhibit a mixed Woods type, indicating combined epidermal and dermal involvement. A study conducted by Achar et al.¹³ dermal type was the most familiar, and in study done by Nicolaïdou E et al.¹⁴ epidermal variety was the most common. Comparative Analysis of Treatment Outcomes: The comparative analysis of treatment outcomes evaluates the efficacy of PRP Therapy and Glycolic Acid Peel in reducing melasma severity. Both modalities demonstrate significant improvements over time, with Group 2 consistently exhibiting lower MASI scores compared to Group 1. This indicates that glycolic acid peels are more effective at treating melasma. The percentage reduction in MASI scores further corroborates the comparative effectiveness of the two treatments, with Group 2 experiencing slightly higher reductions. Understanding treatment outcomes facilitates evidence-based decision-making and optimization of therapeutic strategies for melasma. The safety analysis evaluates the occurrence of adverse events associated with PRP Therapy and Glycolic Acid Peel. While both groups experience adverse events, differences are observed in their occurrences between the two treatments. Group 1 tends to have more cases of erythema and acne, while Group 2 shows instances of post-inflammatory hyperpigmentation. Understanding the safety profiles of different treatments is essential for minimizing risks and optimizing patient safety. Adverse event monitoring informs treatment selection and management strategies for improving tolerability and patient satisfaction. Overall, the detailed analysis of demographic characteristics, clinical presentations, treatment outcomes, and patient experiences provides comprehensive insights into the management of melasma using PRP Therapy and Glycolic Acid Peel. Understanding the nuances of melasma pathophysiology and treatment responses enhances clinical decision-making and improves patient outcomes. To confirm these results and investigate other factors influencing therapy efficacy and patient satisfaction, more research is necessary. Addressing these limitations and exploring future directions can further advance our understanding of melasma pathogenesis and treatment, ultimately improving patient care and outcomes in clinical practice.

CONCLUSION

In our study, Melasma was more common in females and the most common age group encountered in both the group was 25-35 years. The mean duration of presentation was 1-5 years. Sun-exposure was the most common precipitating factor seen in 52.5% in group 1 vs 47.5% in group 2 followed by cosmetics in both groups. Most common type on the basis of Woods Lamp was Mixed type followed by Epidermal and Dermal. Centrofacial was the most common pattern of melasma in both the group followed by malar and mandibular type. Both the modalities are found beneficial with Glycolic acid being more effective than Platelet Rich Plasma. The Percentage reduction in MASI score in PRP group was 50.28% after 24 weeks while in GA group was 59.89%. The most common side effects encountered in both groups was erythema followed by acne and PIH. In conclusion the study findings suggest that 20% glycolic acid peel offer superior outcomes compared to PRP therapy in the treatment of melasma. However, additional research is necessary to validate these observations and understand the treatment effectiveness and safety mechanisms.

REFERENCES:

- McKese J, Tovar-Garza A, Pandya AG. Melasma Treatment: An Evidence-Based Review. *Am J Clin Dermatol*. 2020 Apr;21(2):173-225.
- Ogbechie-Godec OA, Elbuluk N. Melasma: an Up-to-Date Comprehensive Review. *Dermatol Ther (Heidelb)*. 2017 Sep;7(3):305-318.
- Neagu N, Conforti C, Agazzino M, Marangi GF, Morariu SH, Pellacani G et al. Melasma treatment: a systematic review. *J Dermatolog Treat*. 2022 Jun;33(4):1816-1837.
- Basit H, Godse KV, Al Aboud AM. Melasma. [Updated 2023 Aug 8]. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2024 Jan 5.
- Ching D, Amini E, Harvey NT, Wood BA, Mesbah Ardakani N. Cutaneous tumoural melanosis: a presentation of complete regression of cutaneous melanoma. *Pathology*. 2019 Jun;51(4):399-404.
- Katsambas AD, Stratigos AJ, Lotti TM. Melasma. In: Katsambas AD, Lotti TM, editors. *European handbook of dermatological treatments*. 2nd ed. Berlin: Springer; 2003. pp. 336-41.
- Kunninpuram RM, Joy B, Mathew P, Sridharan R, Thyvalappil A, Radhakrishnan K. A clinico-epidemiological study of melasma in a tertiary care hospital: a cross sectional study. *J Pakistan Asso Dermatol*. 2021; 30:310-5.
- Bansal C, Naik H, Kar HK, Chauhan A. A comparison of low fluence 1064nm Q switched Nd:Yag Laser with topical 20% azelaic acid cream and their combination in melasma in Indian patients. *J Cutan Aesthet Surg*. 2012;5:266-72.
- Kumari R, Thappa DM. Comparative study of trichloroacetic acid versus glycolic acid chemical peels in the treatment of melasma. *Indian J Dermatol Venereol Leprol*. 2010;76:447.
- Kumar A, Sharma M. A clinico-epidemiological study of melasma. *Int J Res Dermatol*. 2018;4(4):53.
- Nanjundaswamy BL, Joseph JM, Raghavendra KR. A clinic-dermoscopic study of melasma in a tertiary care center. *Pigment Int*. 2017;4:98-103.
- Jagannathan M, Sadagopan K, Ekkarakudy J, Anandan H. Clinico epidemiological study of patients with melasma in a tertiary care hospital – A prospective study. *Int J Sci Stud*. 2017;4:117-20.
- Achar A, Rathi SK. Melasma: a clinicoepidemiological study of 312 cases. *Indian J Dermatol*. 2011 Jul-Aug; 56(4):380-2.
- Nicolaïdou E, Antoniou C, Katsambas AD. Origin, clinical presentation, and diagnosis of facial hypermelanoses. *Dermatol Clin*. 2007;25(3):321-6.