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Comprehensive Review of Melasma Treatments: Evaluating Efficacy, Safety, and Patient Outcomes

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Abstract

Melasma is a chronic hyperpigmentation disorder affecting sun-exposed facial areas, significantly impacting patients' psychological well-being. This study aimed to review various melasma treatments, including micro-needling, chemical peels, laser therapy, platelet-rich plasma (PRP), and homoeopathic individualized treatment. The objective was to evaluate the effectiveness, side effects, and recurrence rates associated with these treatments. The findings suggest that while conventional treatments show efficacy, they often have limitations such as side effects and recurrence. Homoeopathic treatment offers a promising alternative due to its holistic approach and minimal side effects, although more research is needed to confirm its effectiveness.

Keywords: Chloasma, Hyperpigmentation, Melasma, Therapy

Introduction

Melasma is a recurrent, chronic, and widespread hyperpigmentation disease produced by hyperactive melanocytes, which accumulate a substantial amount of melanin in the layers of the skin including the epidermis and dermis (1). Its common pattern manifests as a marginated facial hyperpigmentation that mainly affects the face. Melasma is an acquired hyperpigmentation disorder characterized by irregular macules and patches ranging from light to dark brown on parts of the body exposed to the sun. The skin of the brow, temples, upper lip, and cheeks are usually affected by these lesions. Melasma commonly spreads in four clinical patterns, namely centrofacial, malar, mandibular, and extrafacial (2). Due to its frequent involvement of the face, it has a severe emotional and psychological impact on the patients' quality of life (2,3). In melasma, both epidermal and dermal melanin content is increased, but its degree depends on the intensity of hyperpigmentation. It is an acquired chronic hypomelanosis of the skin that manifests as irregular brown macules that are symmetrically distributed across sun-exposed body parts, especially the face. Most frequently observed in females and those with Fitzpatrick Skin Types III and VI (3). The specific causes of melasma are unknown (4).

More than a patient's physical condition, melasma has a major impact on their psychological wellbeing (2). Melasma significantly affects one's appearance, leading to mental and emotional distress and diminishing the overall quality of life for patients. Patients often experience emotions such as guilt, low self-esteem, distress, dissatisfaction, and a reluctance to engage in social activities (4). Melasma frequently leads to a substantial psychological impact, negatively affecting both the quality of life and emotional well-being (5).

The prevalence of melasma ranges from 5% to 46% depending on the population. It is estimated that melasma affects 5-7 million women in the United States. A study in Brazil found that melasma affected 15-35% of adult women. Although the precise frequency of melasma in India is unknown, 41% of rice field labourer's surveyed in the country reported having the melasma (6).

Treating melasma remains challenging due to limited effectiveness, high recurrence rates, and potential adverse reactions. Management starts with sun protection and includes various treatments like topical creams, oral medications, chemical peels, microneedling, lasers, and light therapy (7).

Material And Methods :

A thorough examination of the literature was done with PubMed, Google Scholar, and MEDLINE databases with keywords such as melasma, chloasma, and hyperpigmentation. The inclusion criteria encompassed original clinical studies on melasma treatment methods including microneedling, chemical peeling, laser, PRP, and homoeopathic treatment. Studies were not limited to prospective randomized controlled trials (RCTs) and Manuscripts written solely in English were included. The authors did not use any animal subjects in their study, which is based solely on earlier research.

Management :

Microneedling

Rolling small needles over the skin to generate controlled punctures is known as microneedling, a minimally invasive procedure. It is a popular and effective method for skin rejuvenation and scar treatment. Additionally, it can be used for transdermal drug delivery and vaccination(8). Thirty female melasma patients underwent six sessions of microneedling every two weeks along with topical vitamin C application. Using photos taken at each session and the Melasma Area and Severity Index (MASI) score, clinical progress was evaluated.. By the end of the sessions, all patients showed improvement. In the final session, the average MASI score dropped from 8.61 ± 4.45 in the first session to 5.75 ± 4.16 ($P < 0.0001$). The treatment may cause minimal pain during microneedling and post-procedure erythema, but overall has no significant side effects (9).

A comparative study was conducted on thirty female patients with melasma using split-face analysis. Tranexamic acid microneedling was applied to one side of the face, while vitamin C microneedling was applied to the other. Clinical photographs, MASI, Physician Global Assessment (PGA), and Patient Global Assessment (PGA) were used to assess improvement at 0, 4, and 8 weeks. The difference in mean improvement between the two groups at four and eight weeks was analyzed using the Z test. After 8 weeks, tranexamic acid and vitamin C improved MASI, PGA, and PtGA. When using tranexamic acid instead of vitamin C, the improvement was more noticeable but not statistically significant. No significant side effects were observed, with only 10 out of 30 patients (33.3%) experiencing moderate itching and burning sensations, which resolved on their own (10).

This was a blinded, randomised clinical experiment where 42 women with facial melasma were randomly allocated to either Group B (5% retinoic acid alone) or Group A (microneedling plus retinoic acid). Blood samples and procedures were conducted at fifteen-day intervals. Melasma Area Severity Index was used to assess clinical progress (MASI). Over time, the MASI scale and TBARS levels decreased in both groups, with no discernible difference between them. After 30 days, carbonyl levels dramatically climbed. SOD activity started to drop after 30 days and kept going down after 60 days. Sulfhydryl levels in Group A decreased after 60 days. Both groups demonstrated a 50% reduction in MASI score and improvement in the clinical appearance of melasma within 60 days. Retinoic acid microneedling may not be the best option as it reduces non-enzymatic antioxidant defence, crucial for protecting against oxidative stress (11).

Chemical Peeling

Chemical peels are often used as a supplementary treatment to topical regimens to accelerate the removal of melanin-producing pathways. Glycolic acid, Jessner, and retinoic acid are popular types of superficial peels that have a decreased risk of complications and pigmentation problems. Peels are beneficial, according to studies, especially when done as part of a series of treatments. However, chemical peels can cause irritation and inflammation, potentially leading to post-inflammatory

Volume 8, Issue 2; March-April 2025; Page No 503-508

hyperpigmentation (PIH) or melasma rebound (12). Ten RCTs with a total of 478 participants and three prospective comparative studies were included in the study. According to the findings, trichloroacetic acid peel was less efficient than glycollic acid (GA) in lowering the severity index and activity of melasma (MASI). But when it came to MASI, GA was not noticeably better than tretinoin, vitamin C iontophoresis, or amino fruit acid. Based on MASI ratings, the results indicated that topical hydroquinone was less effective than trichloroacetic acid peel and Jessner's solution. In conclusion, those with darker skin types can effectively cure melasma with chemical peels. Topical treatments can be used for maintenance (13).

Three groups of participants underwent different chemical peeling procedures. The success of the therapy was evaluated both before and after using the Melasma Area and Severity Index (MASI) score. Side effects were also monitored and evaluated. Side effects like redness and mild discomfort were less frequent in the TCA group. Research suggests that treating melasma with a 15% TCA peel is both safe and highly effective. It is more efficient in reducing melasma symptoms compared to peels with 15% phenol and 2% glycolic acid (14).

Two groups of fifty-four patients, ages 20 to fifty, were randomly allocated. For a duration of 12 weeks (6 sessions), Group A was administered 70% glycollic acid every two weeks, whereas Group B got weekly injections of intradermal tranexamic acid (4 mg/ml) (12 sessions). Clinical examinations were conducted using the mMASI scale at baseline and weeks 1, 6, and 12. 35 individuals, representing 65% of the total, had modest MASI scores. The post-treatment means for Groups A and B were not statistically significant, despite significant paired t-test results in both groups. According to the study, TXA and glycollic acid work just as well to treat melasma. TXA decreased the likelihood of melasma recurrence, however topical use of glycollic acid demonstrated improved compliance (15).

Laser

Melanin's broad absorption spectrum makes it a target for a wide range of lasers and light sources. Longer wavelengths go deeper into the skin to target pigment, whereas shorter wavelengths are more effective in absorbing melanin. However, because of the significant risk of post-inflammatory hyperpigmentation and its limited efficiency, laser therapy is not advised as the first line of treatment (16). The intervention was completed by 28 patients, with 21 completing the follow-up. Across all modalities, there was a statistically significant but modest decline in the mean melanin index, modified Melasma Area Severity Index (MASI), and patient evaluation by photography. There were no discernible differences between the groups. By the conclusion of the follow-up period, pigmentation had restored in every patient. Group B experienced significantly more adverse effects. Melasma is likely to reappear once treatment is discontinued (17).

The study involved the enrolment of fifteen individuals with Fitzpatrick skin types III and IV, including two males and thirteen women. Each patient received five picosecond laser sessions. The MASI score was used for patient follow-up, with assessments conducted during the first and fifth sessions. Fitzpatrick skin types III and IV showed a better response to treatment with a decrease in MASI score. 73.33% of participants were highly satisfied with the results. The only adverse reaction observed was mild erythema, which resolved within a few hours without pain or burning sensation (18).

A 2-year follow-up study using randomized split-face control was conducted. Each face was divided in half, and at one-month intervals, each half received three treatments—three courses of PSAL or three courses of QSNYL. Images obtained with reflectance confocal microscopy (RCM) were captured in vivo. Between the PSAL sides before and after therapy, there was no statistically significant change after six months. However, mMASI scores for QSNYL sides were significantly lower than the baseline. No severe side effects were documented. Two and four weeks after treatment, reflectance confocal microscopy (RCM) showed a significant infiltration of dendritic melanocytes in the dermis on the PSAL sides. Ten patients had deterioration or recurrences during the two-year follow-up, but there was no statistically significant difference between the two lasers (19).

Platelet-Rich Plasma (Prp)

Centrifuging autologous blood yields platelet-rich plasma (PRP), a concentrated form of platelets. Acne, hyperpigmentation, and alopecia are among the disorders it is used to treat (20). Using a derma pen for

Volume 8, Issue 2; March-April 2025; Page No 503-508

microneedling and microneedles for intradermal microinjections on the left side, autologous platelet-rich plasma (PRP) was injected into the melasma lesions on the right side of the face. Every month, patients received three sessions of therapy. The MASI and mMASI scores significantly decreased after PRP therapy. Additionally, there was a statistically significant decline in the hemi-MASI scores on both sides of the face, with no discernible difference between them (21).

Forty patients received monthly intralesional PRP injections for three months with a follow-up period. Every patient had their modified melasma area severity index (mMASI) score determined, and they also self-rated their level of improvement. At the end of the trial, the average decrease in the mMASI score was 54.5%. Except for xerosis and pruritus, reported in 35% and 25% of patients, respectively, no other significant side effects were observed (22).

Twenty female patients with bilateral facial involvement and mixed-type melasma received intradermal PRP injections three times at four-week intervals. Patient satisfaction was recorded at baseline, four weeks, eight weeks, and twelve weeks. Follow-up over three months showed no melasma recurrence. In mild to severe cases, there was a significant improvement in the modified melasma area and severity score as well as dermoscopic changes by the end of the study. Some patients experienced mild redness and burning after the procedure, but it resolved on its own within a few hours (23).

Homoeopathic Individualized Treatment

Homeopathy is a popular form of complementary medicine that treats diseases with remedies that can produce similar symptoms in healthy individuals(24). Homeopathy believes that external symptoms are reflections of internal imbalances, which can be addressed by treating the patient holistically(25). Homoeopathy provides a comprehensive strategy that takes into account the emotional strain that comes with a patient's sickness as well as the physical and emotional components of their health. According to Hahnemann's aphorisms (188–192) in the Organon of Medicine, local symptoms not caused by external trauma stem from internal dynamic causes. These symptoms involve the whole body, necessitating a holistic approach for individualized treatment. Demonstrates successful management of melasma in a 48-year-old female patient through individualized homeopathic treatment targeting overall health and emotional well-being alongside the skin condition, resulting in a gradual reduction of MSR score and MONARCH score (+9) indicating improvement and suggesting homoeopathy as a valuable complementary therapy for melasma treatment(26).

Discussion :

Melasma is a persistent and distressing hyperpigmentation disorder primarily affecting sun-exposed areas of the face, often causing significant psychological distress due to its impact on appearance. Management of melasma remains challenging due to the high likelihood of recurrence and variable treatment efficacy. Microneedling has shown promising results, particularly when combined with topical agents like vitamin C or tranexamic acid, although its benefits can be influenced by the choice of adjunctive treatment. Chemical peels, such as glycolic acid and trichloroacetic acid, have proven effective, with glycolic acid showing notable results in reducing melasma severity. However, chemical peels may lead to side effects like irritation and post-inflammatory hyperpigmentation. Laser treatments offer a targeted approach but are generally not recommended as first-line therapy due to the risk of exacerbating pigmentation issues and the high likelihood of recurrence. Platelet-rich plasma (PRP) therapy has also demonstrated efficacy in improving melasma symptoms, with minimal side effects reported. Homoeopathic treatments, focusing on holistic care, provide an alternative approach, showing potential benefits in managing both physical symptoms and emotional stress. Overall, the best approach for managing melasma may involve a combination of therapies tailored to individual patient needs, balancing effectiveness with potential side effects and recurrence rates.

Conclusion :

This study discusses conventional treatments for melasma like microneedling, chemical peels, laser therapy, and platelet-rich plasma (PRP). Despite their effectiveness, these methods have limitations such as side effects and recurrence, highlighting the need for safer and more holistic approaches. Homoeopathy has the potential to offer individualised, all-encompassing care with fewer adverse effects, but more clinical

Volume 8, Issue 2; March-April 2025; Page No 503-508

research is needed to validate its efficacy and establish uniform treatment protocols.

References :

1. Grimes PE, Alexis AF. Melasma: Epidemiology, pathogenesis, clinical presentation, and diagnosis. UpToDate. Waltham, MA: Wolters Kluwer. 2019.
2. Aghaei S, Moradi A. Introductory Chapter: Quality of Life in the Patients with Melasma. Pigmentation Disorders-Etiology and Recent Advances in Treatments. 2023 Mar 15.
3. Grimes PE, Ijaz S, Nashawati R, Kwak D. New oral and topical approaches for the treatment of melasma. International Journal of Women's Dermatology. 2019 Feb 1;5(1):30-6.
4. Handel AC, Miot LD, Miot HA. Melasma: a clinical and epidemiological review. Anais brasileiros de dermatologia. 2014 Sep;89:771-82
5. Majid I, Haq I, Imran S, Keen A, Aziz K, Arif T. Proposing melasma severity index: A new, more practical, office-based scoring system for assessing the severity of melasma. Indian journal of dermatology. 2016 Jan;61(1):39.
6. Sarkar R, Jagadeesan S, Basavapura Madegowda S, Verma S, Hassan I, Bhat Y, Minni K, Jha A, Das A, Jain G, Arya L. Clinical and epidemiologic features of melasma: a multicentric cross-sectional study from India. International Journal of Dermatology. 2019 Nov;58(11):1305-10.
7. Jiryis B, Toledano O, Avitan-Hersh E, Khamaysi Z. Management of Melasma: Laser and Other Therapies—Review Study. Journal of Clinical Medicine. 2024 Mar 3;13(5):1468.
8. Singh A, Yadav S. Microneedling: Advances and widening horizons. Indian dermatology online journal. 2016 Jul 1;7(4):244-54.
9. Ismail ES, Patsatsi A, Abd el-Maged WM, Nada EE. Efficacy of microneedling with topical vitamin C in the treatment of melasma. Journal of cosmetic dermatology. 2019 Oct;18(5):1342-7.
10. Menon A, Eram H, Kamath PR, Goel S, Babu AM. A split face comparative study of safety and efficacy of microneedling with tranexamic acid versus microneedling with vitamin C in the treatment of melasma. Indian Dermatology Online Journal. 2020 Jan 1;11(1):41-5.
11. Bergmann CL, Pochmann D, Bergmann J, Bocca FB, Proença I, Marinho J, Mello A, Dani C. The use of retinoic acid in association with microneedling in the treatment of epidermal melasma: efficacy and oxidative stress parameters. Archives of Dermatological Research. 2021 Oct;313:695-704.
12. Trivedi MK, Yang FC, Cho BK. A review of laser and light therapy in melasma. International journal of women's dermatology. 2017 Mar 1;3(1):11-20.
13. Dorgham NA, Hegazy RA, Sharobim AK, Dorgham DA. Efficacy and tolerability of chemical peeling as a single agent for melasma in dark-skinned patients: A systematic review and meta-analysis of comparative trials. Journal of Cosmetic Dermatology. 2020 Nov;19(11):2812-9.
14. Prasad N, Singh M, Malhotra S, Singh N, Tyagi A, Tyagi S. Comparative Efficacy of Chemical Peeling Agents in the Treatment of Melasma. Cureus. 2023 Oct;15(10).
15. Khan N, Hussain M, Muzaffar B, Siddique A, Khan RA, Nazir T. Comparison Study Between Chemical Peeling with 70% Glycolic Acid and Intradermal Tranexamic Acid for the Treatment of Melasma. Pakistan Armed Forces Medical Journal. 2024 Apr 30;74(2).
16. Chatterjee M, Vasudevan B. Recent advances in melasma. Pigment International. 2014 Jul 1;1(2):70-80.
17. Dev T, Sreenivas V, Sharma VK, Sahni K, Bhari N, Sethuraman G. A split face randomized controlled trial comparing 1,064 nm Q-switched Nd-YAG laser and modified Kligman's formulation in patients with melasma in darker skin. International Journal of Dermatology. 2020 Dec;59(12):1525-30.
18. Al Jaff MY, Yawar FJ. Treatment of melasma in Fitzpatrick skin type III and IV by picosecond laser. J Med Surg Pract (JMSP). 2021 Apr;7(2):162-71.
19. Zhou Y, Li Y, Hamblin MR, Wen X. Comparison of 755-nm picosecond alexandrite laser versus 1064-nm Q-switched Nd: YAG laser for melasma: A randomized, split-face controlled, 2-year follow-up study. Lasers in Surgery and Medicine. 2024 Mar;56(3):263-9.
20. Zhao L, Hu M, Xiao Q, Zhou R, Li Y, Xiong L, Li L. Efficacy and safety of platelet-rich plasma in melasma: a systematic review and meta-analysis. Dermatology and Therapy. 2021 Oct;11:1587-97.
21. Hofny ER, Abdel-Motaleb AA, Ghazally A, Ahmed AM, Hussein MR. Platelet-rich plasma is a useful therapeutic option in melasma. Journal of

Volume 8, Issue 2; March-April 2025; Page No 503-508

Dermatological Treatment. 2019 May 19;30(4):396-401.
22. Tuknayat A, Thami GP, Bhalla M, Sandhu JK. Autologous intralesional platelet rich plasma improves melasma. Dermatologic Therapy. 2021 Mar;34(2):e14881.
23. Rout A, Mani S, Bala N. Intradermal platelet-rich plasma for the treatment of melasma: A clinical and dermoscopic evaluation in dark skin. Journal of Cutaneous and Aesthetic Surgery. 2023 Oct 1;16(4):300-5.
24. Simonart T, Kabagabo C, De Maertelaer V. Homoeopathic remedies in dermatology: a systematic review of controlled clinical trials. British journal of dermatology. 2011 Oct 1;165(4):897-905.
25. Bala R, Srivastava A, Chingakham R. Importance of mental symptoms in homoeopathy: A case report on vitiligo. International Journal of Homoeopathic Sciences. 2020;4(1):142-8.
26. Karmakar A. Dr. Agnik Karmakar, Dr. Asit Bhowmick and Dr. Sukanya Mitra.

Volume 8, Issue 2; March-April 2025; Page No 503-508