IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, September 2024

A Review on Advances in Managent of Melesma

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Abstract: *Melasma is a common pigmentary disorder with unresolved pathogenesis. Factors include increased sun exposure, genetics, estrogens, progesteron, and melanocyte stimulating hormone. Treatment is challenging, with many modalities ineffective. Dermal and mixed variants are resistant. Sunscreens, topical depigmenting agents, chemical peels, and light sources are main treatments. Advances in understanding and management have been made. Melasma, a common cosmetic issue, can range from minor pigmentation during pregnancy to chronic, disfiguring conditions. Treatments vary, with hormone replacement therapy and increasing aesthetic demands requiring regular sunscreen use and topical medication. Melisma management is challenging and the outcomes following treatment are not always deemed satisfactory. Solely treating highper pigmentation may prove ineffective unless paired with regenerative techniques and photoprotection, since one of the main reasons for recurrence is sun exposure. Hence the treatment protocol starts with addressing risk factors, implementing stringent UV protection and then treatments, employing laser and light therapies. Melasma is a skin disorder caused by excessive melanin production and accumulation. Factors contributing to this disorder include genetic susceptibility, ultraviolet radiation, hormonal treatments, and abnormal α-MSH release. Efforts have been made to treat hyperpigmentation, including approaches, active molecules, and nanotechnology-based delivery systems. Topical delivery of hypopigmenting agents has shown success.*

Keywords: Melasma type , laser therapy, medical, Hydroquinone, Lasers

I. INTRODUCTION

Melasma is a serious, medically challenging and hyperpigmentation disorder that occurs in young women and men with Fitzpatrick skin types III to VI. The pathogenesis of melisma is complex and complex. Contributing factors that may contribute to the etiopathogenesis of these conditions include genetics, excessive exposure to UV rays and hormonal influences. Medical interventions for melisma are usuallymultifaceted and include photoprotection, oral and topical therapy, and restorative procedures. Because of our increased understanding of the pathogenesis of melisma, new drugs and the strength of our medical equipment Melasma is a chronic pigmentary illness affecting photo exposed areas, especially in women of reproductive age. Its pathophysiology is complex and includes genetic predisposition, UV light, hormonal changes, and drug intake. Most patients have seasonal variations and relapses after treatment. Recent research has identified genetic and vascular growth factors, H19, iNOS, and Wnt pathway modulator genes.

The melanocortin type 1 receptor (MC1R) gene is responsible for skin and hair color.are increasing. Melasma is a common chronic relapsing pigmentary illness that affects photoexposed areas, particularly in women's of reproductive age.

Melasma is a common skin condition characterized by patches of discoloration, typically on the face.

It is often referred to as the "mask of pregnancy" because it frequently affects women during pregnancy. However, melasma can affect anyone, regardless of gender or age.

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Fig. NO.1 Melesma

TYPES OF MELASMA

Epidermal Melasma:

Epidermal melasma has a dark brown color, a well-defined border, appears obvious under black light and sometimes responds well to treatment.

Dermal Melasma:

Dermal melasma has a light brown or bluish color, a blurry border, appears no differently under black light and doesn't respond well to treatment

Mixed Melasma (Epidermal and Dermal):

Mixed melasma, which is the most common of the three, has both bluish and brown patches, shows a mixed pattern under black light and shows some response to treatment.

FACTOR CAUSING MALESMA

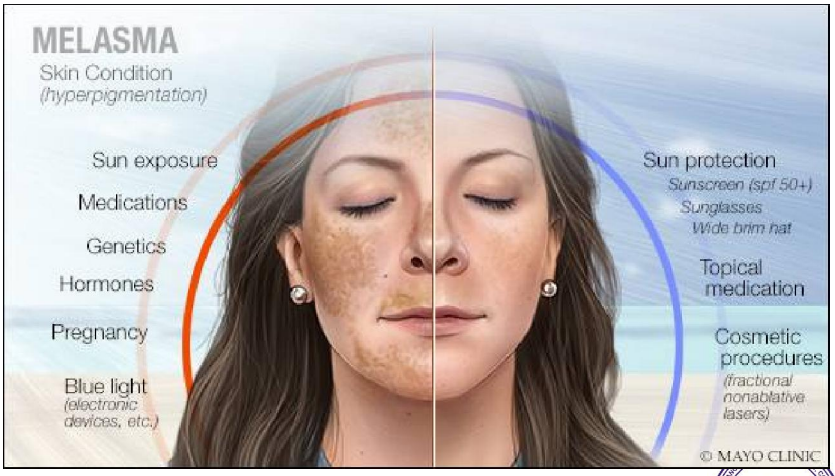

FIG.NO.2 FACTOR CAUSING MELESMA

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1. Harmones
2. Sun exposure
3. Pregnancy
4. Certain medication
5. Hypothyrodism
6. Vitamin B12 deficiency

1. HARMONES

Melasma is a skin condition linked to the hormones estrogen and progesterone, often found in pregnancies and women taking birth control pills. It increases the production of pigment-forming enzymes like tyrosinase, making the affected areas sensitive to increased progesterone levels. Melasma is also common among those using estrogens-containing contraceptives and hormone replacement therapy, and in men using estrogen derivatives for prostatic cancer treatments.

2. SUN EXPOSURE

Ultraviolet radiations are a selective cause of melasma relapse, causing uneven pigment production and brown spots. Sun exposure, including ultraviolet, visible, and infrared light, can damage skin, cause darker or solar-tanned appearance, and cause uneven melanin production, abnormal pigmentation, and permanent stretching of small blood vessels, resulting in a mottled, reddish appearance.

3. PREGNANCY

Melasma during pregnancy, caused by excess estrogens and progesterone, can be permanent but usually fades after birth. Common medications include antibiotics, NSAIDs, diuretics, retinoid hypoglycemic, antipsychotics, targeted therapies, and some drugs like tetracycline and psychotropic.

4. CERTAIN MEDICATIONS

Antibiotics, nonsteroidal anti-inflammatory drugs (NSAIDs) diuretics retinoid hypoglycaemic, antipsychotics,targeted therapies and some drugs. The great common culprits are non steroidalanti-inflammatory drugs. (NSAIDs), tetracycline, and psychotropic drugs.

5. HYPOTHYROID

Several studies had shown association between melasma and thyroid disorders, especially hypothyroidism and thyroid are postulated that can be due to impact of these hormones on inducing the production of inflammatory cytokines. Higher circulating levels of proinflammatory cytokines have been seen in patients with hyperthyroidism. It thus reinforces that melasma can be triggered by conditions associated with skin inflammation.

6. VITAMIN B12 DEFICIENCY

Vitamin B-9 and B12 deficiencies can cause patchy skin and melasma, a common hyperpigmentary disorder. Factors like sunlight, hormones, pregnancy, and genetics contribute to its development. Treatment involves topical agents like hydroquinone and modified Kligman's Regime. However, there is a lack of therapeutic guidelines, particularly in India. A study by 15 Pigmentary Disorders Society experts suggests a combination of hydroquinone and triple combination cream as the most effective treatment.

IMPORTANT OF MELESMA

Melasma is a condition affecting women more commonly than men, with a prevalence ranging from 8.8% among Latino males to 40% in Southeast Asian populations. Factors contributing to melasma include genetic susceptibility, sun exposure, and hormones. A study found that 50% of patients had a family history of melasma in at least one family member. The most common time of onset of melasma was post-pregnancy (42%), with 26% developing it during pregnancy. Pregnancy, oral contraceptives, and sun exposure were the most common precipitating factors. Thyroid disorders are four times greater in patients with melasma. Sun protection for melasma is essential, as light from both

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ultraviolet and visible spectrum is involved in its pathogenesis. Studies have shown that sunscreens with combined UV and short wavelengths of visible light (VL) can prevent melasma relapses. Further research is needed to validate the association between hormones and melasma.

Melasma is a skin condition characterized by brown or blue-gray patches or freckle-like spots. It's often called the "mask of pregnancy." Melasma happens because of overproduction of the cells that make the color of your skin. It is common, harmless and some treatments may help.

Patients with melasma actually are considered to have less risk for melanoma. The dermal pigment may take longer to resolve than the epidermal pigment because no effective therapy is capable of removing dermal pigment. However, treatment should not be withheld simply because of a preponderance of dermal pigment.

The most commonly used treatments for melasma are skin lightening medications that are applied topically. These include medications such as hydroquinone, atelic acid, conic acid, niacinamide, cysteamine, retinol, and tranexamic.Melasma causes patches of discoloration. The patches are darker than your usual skin color. It typically occurs on the face and is symmetrical, with matching marks on both sides of the face. Other areas of your body that are often exposed to sun can also develop melasma.Melasma is significant due to its impact on skin appearance and psychological well-being. It often affects individuals' self-esteem and can be challenging to treat. Understanding its causes and triggers is essential for effective management and prevention. Would you like to delve deeper into treatment options or the underlying factors?

SYMPOTOMS OF MALESMA

Brownish colored patches usually appear on the:

cheeks
forehead
bridge of the nose
chin

It can also occur on the neck and forearms. The skin discoloration doesn't do any physical harm, but you may feel self-conscious about the way it looks.

If you notice these symptoms of melasma, see a medical professional. They might refer you to a dermatologist, a doctor who specializes in treating skin disorders.

CAUSES OF MELASMA

Hormonal Changes: Commonly linked to pregnancy, birth control pills, or hormone replacement therapy.

Sun Exposure: UV rays can trigger melasma, making it more prevalent in sunny climates.

Genetics: A family history of melasma increases the likelihood of developing it.Certain Medications: Some drugs may exacerbate pigmentation.

MEDICATION AND PROCEDURE OF MELASMA

The best treatment is a topical combination of hydroquinone cream and avoidance of sun or estrogen exposure. In addition to the avoidance of sun exposure, discontinuing the use of high-SPF sunscreens (50 or higher) can prevent the development of melasma.

Your dermatologist may prescribe a medication that can decrease the excess pigment in your skin. Most patients receive a prescription for medication that they apply to their skin at home.

Your dermatologist may prescribe one or more of the following:

Hydroquinone: This is a common treatment for melasma. It is applied to the skin and works to even out the skin tone. Hydroquinone is no longer available in products that you can buy without a prescription.

Tretinoin and a mild corticosteroid: This combination contains a retinoid and an anti-inflammatory, which can even out skin tone.

Triple combination cream: This cream contains three medications — tretinoin (a retinoid), a corticosteroid to reduce inflammation, and hydroquinone to even out your skin tone.

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Other medications: Your dermatologist may prescribe a medication that's gentler on your skin like azelaic acid, kojic acid, or vitamin C.

TREATMENT OF MELASMA

Topical Hypo pigmenting

Antioxidant Therapy

Laser Therapy

Herbal Therapy

TOPICAL THERAPIES

Hydroquinone:

Hydroquinoneor1-4-dihydroxybenzene, lighten skin by stopping tyrosinase activity , which leads to a reduction in the transfer of melanosomes within keratinocytes and increasedmelanosome destruction is commonly used in topical concentration of 2% to 4% but can be compounded to reach higher concentrations. Although these higher concentration may be more efficacious, there is also an increased risk of side effects, including irritant dermatitis, which can lead to subsequent hyperpigmentation. Long-term use specially of high concentration has the potential to cause exogenous ochronotic. Hydroquinone reduces melanin pigment manufacturing through inhibition of the tyrosinase enzyme, which is involved in the initial step of the melanin pigment biosynthesis pathway. Hydroquinone takes several months totake impact.

Retinoid

Topical Retinoids have demonstrated advantage in the treatment of melasma by promoting keratinocyte turnover, reducing melanosome transfer, and decreasing melanin levels via epidermoptids. When blended with other topical treatments , retinoids can help to facilitate penetration into the epidermis and increase local drug bioavailability, which enhances overall blighting capabilities. High concentrations should be used with caution because of irritation and further dyspigmentation.

Azelaic acid:

Azelaic acid (AZA) is a naturally occurring by the product of the metabolism of pittosporum oval and is Associated with hypo melanosis seen in tinea versicolor. In vitro, azelaic acid reversibly inhibits tyrosinase Activity and may also interfere with activity. A recent study suggests that 20% azelaic acid cream applied twice daily may be More effective than hydroquinone 4% in reducing mild melasma.

Triple Combination Creams:

The gold standard TCC is the Klugman formula, which is a combination of a retinoid, hydroquinone, and cortico-steroid In a study of 120 patients with facial melasma who applied either TCC cream, consisting of Hydroquinone 4% trerinoin 0.05%,and fluocinolone Acetonide 0.01%, once daily , or hydroquinone 4% cream Twice daily for 8 weeks, an improvement of more than 75% was achieved by 73% of those using TCC compared with 49% of those using hydroquinone cream .

ANTIOXIDANT THERAPY

Vitamin C:

Vitamin C, or ascorbic acid, is a potent antioxidant with a myriad of research on its function in various diseases. It is a ROS scavenger and regenerate various other antioxidants Vitamin C and magnesium ascorbic phosphate (MAP), a vitamin C derivative, have been investigated for their role in treating melasma.Oral vitamin C supplementation has been studied treatment of hyperpigmentation issues. for Vitamin C cream has been investigated as a topical treatment for melasma, by both direct skin and ultrasound software.

LASER THERAPY

Switched Nd: YAG Laser - Tissue Interaction:

The Q- switched Nd: YAG laser is the laser of choice for dealing with dermal and mixed epidermal -dermal pigmented lesions, especially in darkish pore and skin. The laser's ability to specially target melanosomes in melanocytes,

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keratinocytes and melanophores, its ultra short pulse width (in nanoseconds) and adjustable spot size are key factors that allow effective targeting of dermal pigment Depth of penetration and selectivity are function of the wavelength of a laser. The Q-switched Nd: YAG laser has two wavelengths extended wavelength of 1064 nm is ideal for dermal lesions due to its deeper penetration and bad absorption in epidermal melanin. These laser have large spot size up to 10 nm, which also permit deep penetration of the laser beam. Depth of penetration is directly proportional to the spot size of the beam, as greater photons are possible toremain within the space. The mechanismincludes both a photothermal impact and photomechanical/ photo acoustic phenomenon that is based on the principle of selective photo thermolysis. To achieve successful effect and minimum side effects, it is necessary to do laser therapy.

HERBAL THERAPY

your melasma is triggered by pregnancy or birth control pills, it's possible the discolored patches will fade on their own after the pregnancy or if you stop taking the pills.

You might consider treating your melasma at home, though. Here are some common home remedies:

Aloe Vera

A 2017 studyTrusted Source on pregnant women with melasma found using a topical, liposome-encapsulated Aloe Vera preparation significantly improved their melasma.

Polyp odiumleucotomies

This is a fern native to Central and South America. It's sold under the brand names Kalawalla and Heliocare. It's also called calaguala and anapests.

A 2014 reviewTrusted Source of literature found orally taking Polyp odiumleucotomies can treat melasma. However, researchers don't include a recommended dosage.

Tranexamic acid

According to a 2017 literature reviewTrusted Source, tranexamic acid is another promising oral therapy for melasma. This acid is a synthetic derivative of the amino acid lysine.

Glutathione

This antioxidant comprises three amino acids (cysteine, glutamic acid, and glycine). It's found in most mammals.

The same 2017 reviewTrusted Source found that, when taken in an oral form, glutathione decreased melanin in people with melasma compared to those who took a placebo. An excess of melanin production can lead to hyperpigmentation.

Sun protection

Protect your skin. Wear sunscreen every day, and reapply every two hours. Consider wearing a wide-brimmed hat when you're outside

MEDICAL MANAGEMENT

Sunscreen

Melasma treatment involves sunscreens, which protect patients from UVA wavelengths and visible light. Most commercial sunscreens don't block wavelengths >380 nm, causing pigmentation. A broad spectrum sunscreen with a minimum UVA protection factor (UVAPF) of at least one-third of the sun protection factor (SPF) is most useful. Sunscreens in the visible light range often contain iron oxides, increasing their photoprotection capacities.

New technologies like sunspheres and microencapsulation enhance sunscreen effectiveness by encapsulating active ingredients in a silica shell, while microencapsulation allows safe combination of incompatible ingredients without loss of efficacy.

II. CONCLUTION

Melasma treatment is challenging due to relapsing tendencies, difficult-to-treat dermal components, and emotional swings. Sun protection and safe treatment regimens are essential. First line therapy combines HQ with topical tretinoin and steroids. New agents have been developed, but none have been ratified by clinical trials.

Dermal pigmentation takes longer to regress than epidermal pigmentation, and treatment should be considered even if mainly dermal pigment is present. Indian skin is darker and exposed to strong sunlight.

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Melasma treatment options include topical, systemic, and procedural methods. Recent advancements in laser and light devices have led to the development of low fluence Q-switched neodymium-doped yttrium aluminum garnet lasers, picosecond lasers, and non-ablative fractional lasers. Topical lightening agents are typically used initially, but energy-based devices are recommended for patients with refractory or recurrent lesions. Combining these devices with topical lightening agents offers a higher response rate, shorter treatment duration, lower side effects, and reduced recurrence rates.

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