

MELASMA

INTRODUCTION

Background

Melasma is an acquired hypermelanosis of sun-exposed areas. It presents as symmetric hyperpigmented macules/patches, which can be confluent or punctuate. The cheeks, the upper lip, the chin, and the forehead are the most common locations, but it can occasionally occur in other sun-exposed locations. Chloasma is a synonymous term sometimes used to describe the occurrence of melasma during pregnancy.

Pathophysiology

The pathophysiology of melasma is uncertain. In many but not all cases, a direct relationship with female hormonal activity appears to be present because it occurs with pregnancy and with the use of oral contraceptive pills.

The most important factor in the development of melasma is exposure to sunlight. Without the strict avoidance of sunlight, potentially successful treatments for melasma are doomed to fail.

Race

People of any race can be affected. However, it is much more common in constitutionally darker skin types than in lighter skin types, and it may be more common in light brown skin types, especially Hispanics and Asians, from areas of the world with intense sun exposure.

Sex

Melasma is much more common in women than in men. Women are affected in 90% of cases. When men are affected, the clinical and histologic picture is identical.

Age

Melasma is rare before puberty and most commonly occurs in women during their reproductive years.

Clinical

The macular hyperpigmentation of melasma is commonly tan to brown. Blue or black may be evident in patients with dermal melasma. The distribution is one of three patterns: centrofacial, malar, or mandibular.

The excess melanin can be visually localized to the epidermis or the dermis by use of a Wood lamp (wavelength, 340-400 nm).

Epidermal pigment is enhanced during examination with a Wood light, whereas, dermal pigment is not.

Clinically, a large amount of dermal melanin is suspected if the hyperpigmentation is bluish black.

In individuals with dark-brown skin, examination with a Wood light does not localize pigment, and these patients are thus classified as indeterminate.

Causes

A genetic predisposition is a major factor in the development of melasma. It is much more common in women than in men. People with light brown skin types from regions of the world with intense sun exposure are much more prone to the development of melasma. More than 30% of patients have a family history of melasma.

Another major factor is exposure to sunlight. Sunscreens that primarily block UV-B radiation (290-320 nm) are unsatisfactory because longer wavelengths (UV-A and visible radiation, 320-700 nm) also stimulate melanocytes to produce melanin. Now there is some evidence that visible light (indoor artificial light) may stimulate it.

Hormonal influences play a role in some individuals. The mask of pregnancy is well known to obstetric patients. The exact mechanism by which pregnancy affects melasma is unknown.

TREATMENT

Melasma can be difficult to treat. The pigment of melasma develops gradually, and resolution is also gradual. Resistant cases or recurrences occur often and are certain if strict avoidance of sunlight is not rigidly needed. All wavelengths of sunlight, including the visible spectrum, are capable of inducing melasma.

Quick fixes with destructive modalities (eg, cryotherapy, medium-depth chemical peels, lasers) yield unpredictable results and are associated with a number of potential adverse effects, including epidermal necrosis, postinflammatory hyperpigmentation, and hypertrophic scars. The precise manner in which these modalities can be used has not been fully delineated. However, in some experienced hands, they have been anecdotally reported to be safe, effective, and

produce results much quicker than topical medications. More careful study is needed before they can be recommended as a standard treatment.

In an attempt to hasten resolution, many practitioners attempt mild exfoliation with superficial chemical peels. The rationale is that if melanogenesis is inhibited with bleaching agents and keratinocyte turnover is increased, the time to resolution can be reduced. A number of studies have shown that treating melasma with superficial chemical peels and a bleaching agent is safe and effective. Whether superficial chemical peels versus bleaching agents alone actually hasten the resolution of pigment is debated. Studies comparing bleaching agents alone to the combination of bleaching agents and superficial chemical peels are ongoing and may help to resolve the debate.

The mainstay of treatment remains topical depigmenting agents. Hydroquinone (HQ) is most commonly used.

It is a hydroxyphenolic chemical that inhibits tyrosinase, leading to the decreased production of melanin. Additionally, cytotoxic metabolites may cause interference with melanocyte function and viability.

Concentrations vary from a 2% concentration available in the United States without a prescription to a commercially available prescription of 4% concentration or compounded prescriptions of up to 12 or rarely 16%.

Efficacy is directly linked to concentration, but the incidence of adverse effects also increases with concentration. All concentrations can lead to skin irritation, phototoxic reactions with secondary postinflammatory hyperpigmentation, and irreversible exogenous ochronosis which is a blue-black pigment in the skin (reported even with long-term use of 2% HQ). So if any irritation or worsening of color, stop hydroquinone and call to be re-evaluated.

The use of topical tretinoin can be effective as monotherapy. However, the response to treatment is less than with HQ and can be slow, with improvement taking 6 months or longer. As such, combinations of tretinoin with HQ, with a topical corticosteroid, have been promoted. The retinoid is believed to work by increasing keratinocyte turnover and thus limiting the transfer of melanosomes to keratinocytes. The major adverse effect is skin irritation, especially when the more effective, higher concentrations are used. Temporary photosensitivity and paradoxical hyperpigmentation can also occur.

Azelaic acid, available as a 20% cream-based formulation, appears to be effective. The primary adverse effect is skin irritation. No phototoxic or photoallergic reactions have been reported.

Other depigmenting agents that have been studied in the treatment of melasma are 4-N-butylresorcinol, phenolic-thioether, 4-isopropylcatechol, kojic acid, and ascorbic acid.

Activity

Regardless of the treatments used, all will fail if sunlight is not strictly avoided. Using sunscreen alone is not enough. The patient must act like she is allergic to sunlight and realize UVA rays penetrate untreated window glass. Prudent measures to avoid sun exposure include hats and other forms of shade combined with the application of a broad-spectrum sunscreen at least daily. Sunscreens containing physical blockers, such as titanium dioxide and zinc oxide, are preferred over chemical blockers because of their broader protection. In addition, it might be wise to use a lotion or make-up with the ingredient iron oxide in it to block visible light. (BB creams and mineral make-up often have iron oxide.) UV-B, UV-A, and visible light are all capable of stimulating melanogenesis. In addition, patients should be forewarned that resolution is gradual and may take many months.

Prognosis

Dermal pigment may take longer to resolve than epidermal pigment or may not be removed at all, 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 source of the dermal pigment is the epidermis, and, if epidermal melanogenesis can be inhibited for long periods, the dermal pigment will not replenish and will slowly resolve.

Resistant cases or recurrences occur often and are certain if strict avoidance of sunlight is not rigidly needed. Strict sun avoidance is essential for resolution and to prevent recurrence.

Patients should apply bleaching creams to areas of darkening only.

Resolution with strict sun avoidance and topical bleaching creams can take months; caution patients to expect slow but gradual lightening.

Consider taking a few month break from hydroquinone every few months. Some reports suggest better results with breaks and lower incidence of side effects.