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Case Report

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Dual diagnosis of melasma and vitiligo: coexistence of opposing pigmentary disorders

Abstract

Melasma and vitiligo are acquired pigmentary disorders with seemingly opposite pathophysiological mechanisms. While melasma is characterized by increased melanin production with preservation of functional melanocytes, vitiligo corresponds to acquired depigmentation secondary to the functional or structural loss of these cells. The coexistence of both entities represents a diagnostic and therapeutic challenge.

We report the case of a 48-year-old woman with concomitant facial melasma and non-segmental vitiligo. Diagnosis was established through clinical examination and Wood's lamp evaluation, which highlighted depigmented lesions characteristic of vitiligo alongside reticulated hyperpigmented patches consistent with melasma. This case highlights the diagnostic and therapeutic challenges that arise when two pigmentary disorders with opposing pathophysiological mechanisms occur simultaneously.

Keywords: cutaneous hyperpigmentation, melanocytes, melasma, nonsegmental vitiligo, skin pigmentation disorders

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Introduction

Cutaneous dyschromias are defined as alterations in skin pigmentation secondary to changes in melanin synthesis, function, distribution, or loss, derived from melanocytic dysfunction or abnormalities in pigment transfer to keratinocytes.[1–2]

Clinically, these entities may manifest as hyperpigmentation, hypopigmentation, or depigmentation and constitute a frequent reason for dermatologic consultation. Beyond their clinical importance, dyschromias significantly affect patients' quality of life by impacting psychological well-being, self-esteem, and aesthetic perception, especially when involving visible areas.[1]

Within this broad spectrum, melasma and vitiligo represent two of the most prevalent acquired pigmentary disorders. Melasma is characterized by chronic hyperpigmentation, usually with predominant facial distribution, associated with hormonal factors, sun exposure, and genetic predisposition. Vitiligo, in contrast, corresponds to acquired depigmentation secondary to the functional or structural loss of melanocytes. Despite their clinical and pathophysiological differences, their coexistence raises overlapping mechanisms and entails diagnostic and therapeutic challenges.[1–2]

Case presentation

A 48-year-old woman from Valledupar, Colombia, with no significant medical history, was evaluated due to several months of asymptomatic hyperpigmented and hypopigmented facial macules without prior treatment. Clinical examination revealed a Fitzpatrick phototype IV patient with smooth, well-defined but irregular hyperpigmented macules on both cheeks, merging with well-demarcated acral macules within and toward the lower third of the face, which showed accentuation under Wood's lamp. Based on the clinical findings, a diagnosis of melasma concomitant with non-segmental vitiligo was established. (Figure 1, Figure 2)

Treatment was initiated with an oral supplement containing Polypodium leucotomos 230 mg plus resveratrol 20 mg, and topical therapy with tranexamic acid 5%, glycolic acid 6%, and salicylic acid 0.5%. Tacrolimus 0.1% ointment was added focally on vitiligo lesions. Given the need to address both pigmentary disorders simultaneously, an antioxidant-based strategy was selected due to its potential role in reducing oxidative stress implicated in both melasma and vitiligo. Tacrolimus was applied selectively to vitiliginous areas to promote repigmentation while avoiding agents such as hydroquinone that could potentially worsen depigmented lesions.

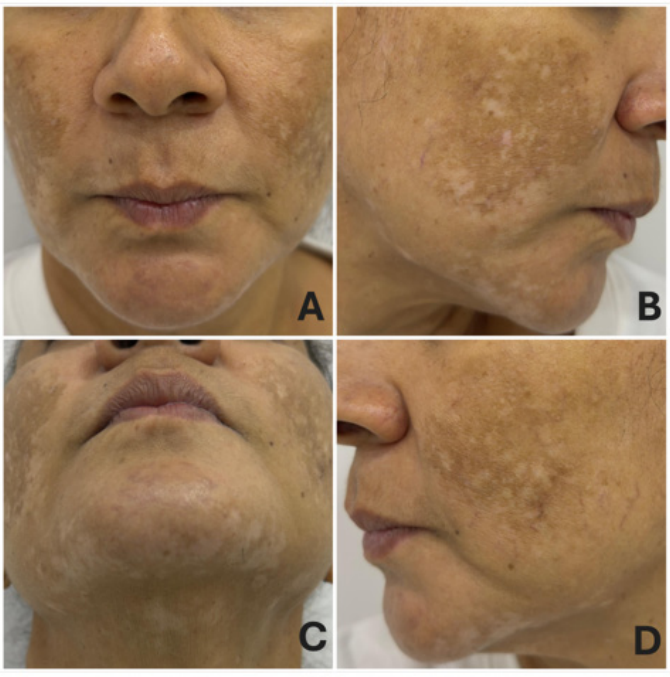

Figure 1 Clinical presentation of concurrent melasma and nonsegmental vitiligo.

(A) Frontal view showing well-defined depigment macules interspersed with reticulated hyperpigmented patches characteristic of melasma.

(B) Right lateral view highlighting irregular hyperpigmented areas with superimposed depigmented macules on the malar region.

(C) Submental view demonstrating the extension of both hyperpigmented and hypopigmented lesions toward the mandibular and submental areas.

(D) Left lateral view showing asymmetric distribution of melanosis associated with focal areas of depigmentation consistent with non-segmental vitiligo.

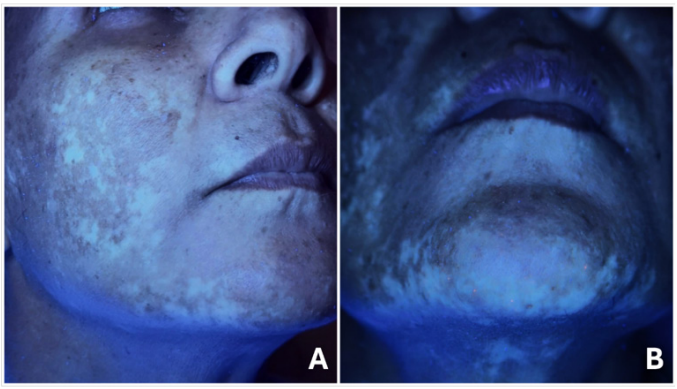

Figure 2 Wood's lamp findings in concurrent melasma and vitiligo.

(A) Oblique view of the right hemiface demonstrating areas of reticulated hyperpigmentation consistent with melasma, alongside sharply demarcated hypopigmented patches that exhibit bright blue–white fluorescence characteristic of vitiligo.

(B) Submental view highlighting the distribution of hypopigmented vitiligo lesions with accentuated fluorescence, interspersed with melasma-associated hyperpigmented areas.

The patient demonstrated good adherence and remains under ongoing dermatologic follow-up.

Discussion

Melasma and vitiligo are cutaneous pigmentary disorders with opposing clinical presentations and pathophysiological mechanisms; therefore, their coexistence represents an uncommon but clinically relevant diagnostic and therapeutic challenge.[3,4]

Vitiligo is a chronic skin disease characterized by destruction or loss of melanocytes, leading to depigmentation and clinically manifesting as well-demarcated achromic macules, typically asymptomatic and sometimes associated with poliosis.[4] Although it is not linked to significant morbidity or mortality, vitiligo has a considerable physical, psychological, and social impact. Its global prevalence ranges from 0.1% to 2%, with onset possible at any age, although a peak occurs before 20 years.[5–7]

Vitiligo is classified into segmental, with early onset and unilateral distribution, and non-segmental, the most frequent type, characterized by bilateral and symmetrical distribution.[7] This group includes mucosal, acrofacial, generalized, universal, and focal variants.[7,8] Melasma-also known as chloasma-is an acquired pigmentary disorder affecting mainly individuals with Fitzpatrick phototypes III-VI, with a predominance in women aged 40-50 years and reported prevalence between 9% and 40%.[8,9] It is characterized by irregular, reticulated, symmetrical hyperpigmented macules in centrofacial, malar, or mandibular areas, with intensity depending on epidermal or dermal melanin deposition.[10]

Its pathogenesis is multifactorial, involving genetic predisposition, melanocytic hyperactivity, UV-induced keratinocyte-immune cell interactions, melanogenesis stimulation, dermal changes such as solar elastosis, increased mast cells, and augmented vascularization. Growth factors such as VEGF and endothelin-1 play central roles, while estrogen contributes to persistent hyperpigmentation.[10]

Diagnosis of both disorders is primarily clinical. Wood's lamp examination helps assess pigment depth in melasma and reveals intense white-bluish fluorescence in vitiligo lesions. Biopsy is rarely required but can assist in doubtful cases with several differential diagnoses.[1,2,8,9]

Therapeutic challenges in the coexistence of melasma and vitiligo

Treatment of melasma and vitiligo is challenging due to variable clinical response and high relapse rates. Although both disorders involve melanocytes, their therapeutic goals are opposing: reducing melanin production in melasma versus restoring pigmentation in vitiligo.

A study comparing narrowband UVB therapy in patients with vitiligo associated with melasma versus vitiligo alone found better repigmentation outcomes in the coexistence group, achieving therapeutic goals faster and with greater pigmentation.[4,5,7,10,11]

Hydroquinone, commonly used for melasma, can induce chemical leukoderma. Due to its melanotoxic and oxidative stress–inducing effects, hydroquinone may worsen hypopigmented lesions in vitiligo, where melanocytes already demonstrate reduced capacity to manage oxidative stress.[11,12]

At Chang Gung Memorial Hospital, oral tranexamic acid 250 mg every 12 hours for at least five months showed repigmentation in vitiligo lesions within one month in patients with concomitant melasma, without worsening vitiligo activity.[13]

A systematic review and meta-analysis on antioxidants demonstrated a beneficial role in both disorders. *Polypodium leucotomos* improved repigmentation, reduced oxidative damage and inflammation, and enhanced response to depigmenting therapies, making it potentially beneficial in patients presenting with both vitiligo and melasma.[14]

In both conditions, strict photoprotection is essential. Given the psychological burden associated with dyschromias,[2,3,8] a holistic approach including psychological support may further improve adherence and overall quality of life.[5,8]

The coexistence of melasma and vitiligo ultimately represents a therapeutic paradox, as both disorders involve melanocytes but require opposite treatment strategies. While melasma management focuses on reducing melanogenesis and pigment deposition, vitiligo therapy aims to stimulate repigmentation and preserve remaining melanocytes. Recognizing this paradox is essential for designing individualized treatment strategies that avoid exacerbating either condition.

Conclusion

The coexistence of melasma and vitiligo represents a rare but clinically relevant diagnostic and therapeutic challenge. Because these conditions involve opposing melanocytic mechanisms, treatment requires careful selection of therapies that avoid exacerbating either disorder. Antioxidant-based strategies and targeted therapies may provide a balanced approach for managing both conditions simultaneously while protecting melanocyte function. Recognition of this therapeutic paradox is essential to guide individualized management in patients presenting with concurrent pigmentary disorders.

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Conflict of interest

The authors declare there is no conflict of interest.

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