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CASE REPORT

Hydroquinone triggering segmental vitiligo

Vitiligo segmentar desencadeado por hidroquinona

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Abstract

Chemically induced vitiligo is a disorder that can occur in genetically susceptible individuals after repeated exposure to a substance. Hydroquinone, a drug commonly found in skin depigmenting formulations, can induce or exacerbate vitiligo. We report a case of a patient who developed segmental vitiligo following the use of a topical depigmenting agent containing hydroquinone. We report the first case in the literature of hydroquinone-induced segmental vitiligo, during melasma treatment, in a genetically susceptible patient. This case highlights the importance of medical precaution when prescribing skin depigmenting agents to patients with a possible genetic predisposition to vitiligo.

Keywords: Segmental vitiligo. Hydroquinone. Melasma.

Resumo

Vitiligo quimicamente induzido é um distúrbio que pode ocorrer em indivíduos geneticamente suscetíveis após exposição repetida a determinada substância. A hidroquinona, um agente comumente presente em formulações despigmentantes de uso tópico, pode induzir ou agravar o vitiligo. Apresentamos um caso de uma paciente que desenvolveu vitiligo segmentar após uso de despigmentante cutâneo com hidroquinona. O que acrescenta ao conhecimento atual: relatamos o primeiro caso descrito na literatura de vitiligo segmentar induzido por hidroquinona, ocorrido durante o tratamento de melasma, em uma paciente com predisposição genética. Este caso ressalta a importância da cautela médica na prescrição de agentes despigmentantes cutâneos para indivíduos com possível predisposição genética ao vitiligo.

Palavras-chave: Vitiligo segmentar. Hidroquinona. Melasma.

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Introduction

Segmental vitiligo (SV) is associated with an autoimmune attack on a localized area of genetic mosaicism[1-3], while chemically induced vitiligo (CIV) is an acquired disorder in genetically susceptible patients following repeated exposure to a substance[4,5]. Monobenzyl ether of hydroquinone (MBEH) was the first chemical noted to induce depigmentation in the skin[6]. Hydroquinone is a chemical structurally related to MBEH and frequently used in skin-lightening agents; however, it has not been clearly implicated in the induction or exacerbation of vitiligo when used for cosmetic purposes[7,8].

Case report

A 43-year-old female was referred to the dermatology service due to vitiligo. According to her history, she had been treated for melasma (Fig. 1) using a combination of hydroquinone 40 mg/g, tretinoin 0.5 mg/g, and fluocinolone acetonide 0.1 mg/g. After 1 year, the patient developed unilateral skin depigmentation. A physical examination revealed achromic patches, more pronounced under Wood's lamp, in the malar, mandibular, infraorbital, and superciliary regions, affecting only the right side of the face (Fig. 2). The patient had a prior diagnosis of Hashimoto's thyroiditis; however, there was no personal or family history of vitiligo or other autoimmune disorders. Follow-up evaluations were conducted bimonthly over a 2-year period to monitor the lesions and confirm that the distribution pattern remained consistent with SV. Considering the clinical history, 2-year follow-up, and physical examination findings, the diagnosis of SV triggered by the use of depigmenting agents was given, and no further tests were required (Figs. 3 and 4).

As a therapeutic approach, phototherapy (Narrowband – ultraviolet B) was initiated twice a week with an initial dose of 200 mJ/cm2, up to a maximum dose of 400 mJ/cm2, with no side effects. After 37 sessions, the lesions showed partial repigmentation. The informed consent was accepted and signed by the patient.

Discussion

CIV is an acquired disorder that presents as hypopigmented/achromic patches following repeated exposure to a chemical agent in individuals with a genetic predisposition to vitiligo. The theory is that oxidative stress induced by the agent triggers an immune response, leading to melanocyte destruction[5]. Hydroquinone is a

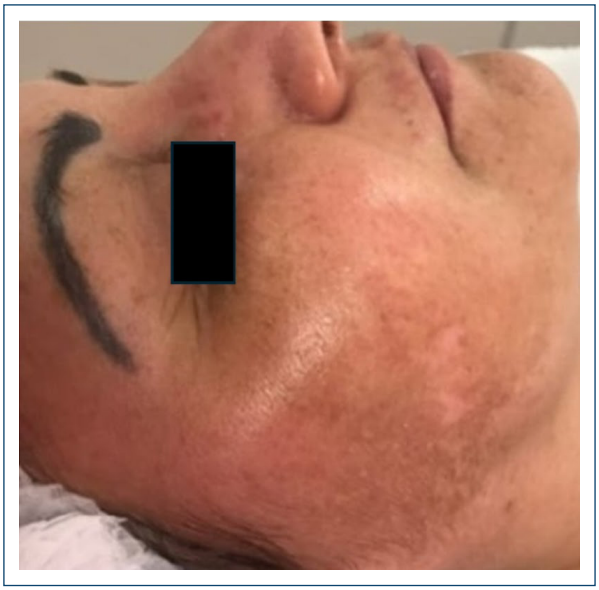

Figure 1. Patient before starting melasma treatment with hidroquinone.

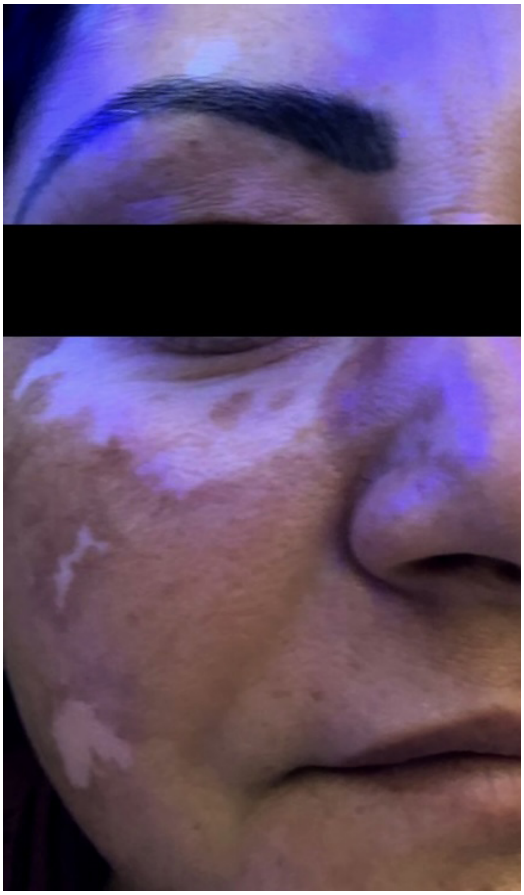

Figure 2. Achromic patches, more pronounced under Wood's lamp, in the malar, mandibular, infraorbital, and superciliary regions, affecting only the right side of the face.

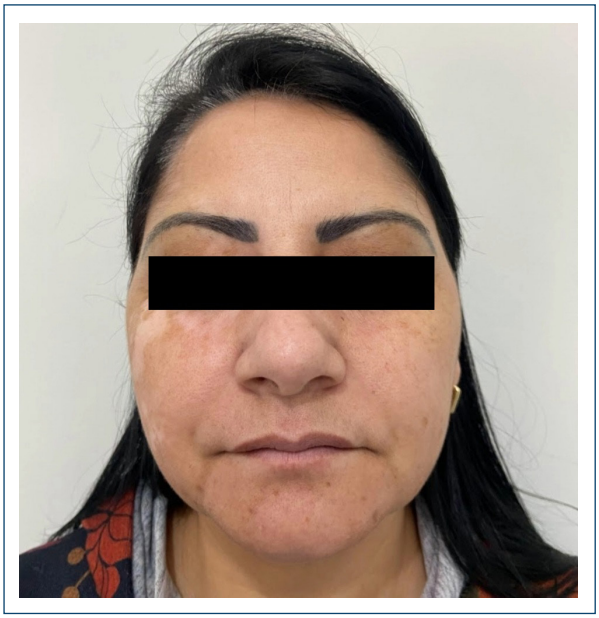

Figure 3. Achromic patches affecting only the right hemiface (segmental vitiligo), triggering after use of a skin depigmenting agent.

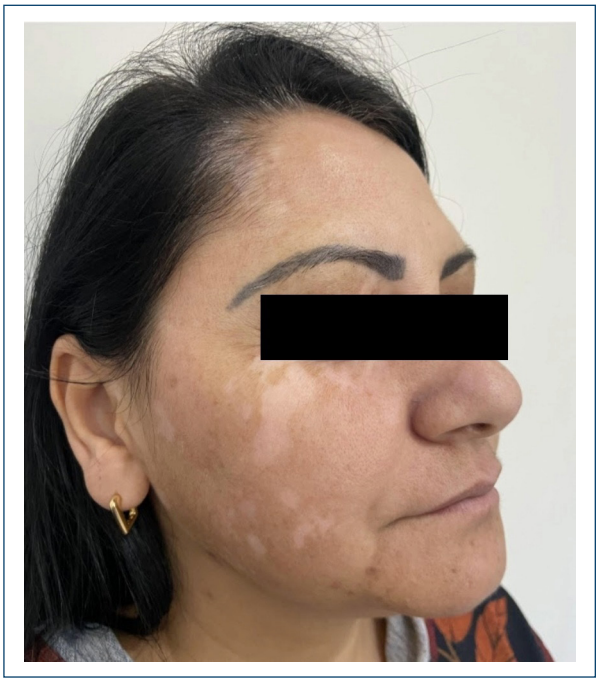

Figure 4. Achromic patches affecting only the right hemiface (segmental vitiligo).

drug commonly prescribed for the treatment of melasma and other skin hyperpigmentation conditions[7,9]. However, a rare adverse effect associated with this substance is drug-induced vitiligo, first observed with MBEH; nevertheless, it remains controversial whether hydroquinone for cosmetic purposes could trigger vitiligo[8].

The first case of persistent leukoderma caused by hydroquinone was described in 1982. Since then, new cases have been reported, with the most commonly documented concentrations ranging from 2% to 4%, primarily affecting African, American, and Indian populations. The mechanism is still not well understood; however, it is suggested that hydroquinone may act as a potential trigger for vitiligo in susceptible patients[9].

SV accounts for 3-20% of vitiligo cases and corresponds to a unilateral, typical distribution area, which usually has rapid but limited depigmentation. The disease course is usually limited to a period of 6-24 months, rarely extending after this period. Although less common, SV may be associated with autoimmune diseases. Its pathophysiology is associated with an autoimmune attack against melanocytes in area of genetic mosaicism[2,3]. In this case, we believed that hydroquinone acted as a trigger for the onset of an autoimmune attack in a genetically susceptible patient.

Regarding treatment, CIV generally shows a better therapeutic response compared to common vitiligo, with tendency for repigmentation[5]. However, SV is more refractory to treatments, with poor response to phototherapy and lower repigmentation rates. The reported patient exhibits a compatible clinical finding and highlights the therapeutic refractoriness of SV3.

Hydroquinone preparations may be considered triggers for the phenotypic presentation of vitiligo in specific patients who harbor the mosaic mutation for SV. It emphasizes the importance for dermatologists and primary physicians to exercise caution when prescribing depigmenting agents to patients with a possible genetic predisposition to SV.

Funding

None.

Conflicts of interest

C.C. Silva-de Castro: Aché, Sun Pharma, and Abbvie – Advisory Board. Pfizer – Consultant. There are no other conflicts of interest among the authors.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

Confidentiality, informed consent, and ethical approval. The authors have followed their institution's

confidentiality protocols, obtained informed consent from patients, and received approval from the ethics

Committee. The SAGER guidelines were followed according to the nature of the study.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

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