Caso Clínico

Leucodermia Adquirida num Doente com Dermatite de Contacto Alérgica ao FreeStyle Libre®

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RESUMO – Nos últimos anos, os sensores de glicose FreeStyle Libre® têm sido associados a inúmeros casos de dermatite de contato alérgica. O alérgenio responsável pela maioria destes casos é o acrilato de isobornilo, uma substância presente no sensor que migra através adesivo, atingindo assim a pele. A leucoderma adquirida pode surgir em áreas previamente afetada por uma dermatite de contato alérgica, tendo sido descrita em associação a vários dispositivos médicos com adesivos. No entanto, até ao momento, foi descrito apenas um caso de leucoderma induzida por sensibilização de contato ao FreeStyle Libre®.
Descrevemos o caso de uma mulher de 41 anos com diabetes *mellitus* tipo 1, que desenvolveu leucoderma em associação a uma dermatite de contato alérgica a este sensor de glicose.
PALAVRAS-CHAVE – Acrilatos/efeitos adversos; Automonitorização da Glicemia; Dermatite de Contato Alérgica/etiologia; Hipopigmentação/induzida quimicatmente.

Acquired Leukoderma in a Patient with Allergic Contact Dermatitis to FreeStyle Libre®

ABSTRACT – *In the past few years, the glucose sensor FreeStyle Libre® has been associated with several cases of allergic contact dermatitis. The allergen responsible for most of these cases is isobornyl acrylate, a substance present within the sensor that migrates through the adhesive, thereby reaching the skin. Acquired leukoderma, which may occur in an area previously affected by allergic contact dermatitis, has been described in several medical devices with adhesives. However, until the present, only one case of leukoderma induced by allergic contact dermatitis to FreeStyle Libre® has been described.*
We report the case of a 41-year-old woman with diabetes mellitus type 1, who developed leukoderma in association with allergic contact dermatitis to this glucose sensor.
KEYWORDS – *Acrylates/adverse effects; Blood Glucose Self-Monitoring; Dermatitis, Allergic Contact/etiology; Hypopigmentation/chemically induced.*

INTRODUCTION

Allergic contact dermatitis (ACD) to the glucose sensor FreeStyle Libre® has been increasingly recognized in the past few years. The allergen responsible for most cases is isobornyl acrylate (IBOA; CAS 5888-33-5), a substance present within the sensor that migrates through the adhesive, thereby reaching the skin.[1] Herein we report a case of leukoderma induced by FreeStyle Libre®, a rare phenomenon occurring along with ACD to this medical device.

CASE REPORT

A 41-year-old woman with type 1 diabetes *mellitus* was referred to our department due to suspicion of contact dermatitis to the glucose sensor FreeStyle Libre®, which she had been using for 6 months. Besides the dermatitis itself, the

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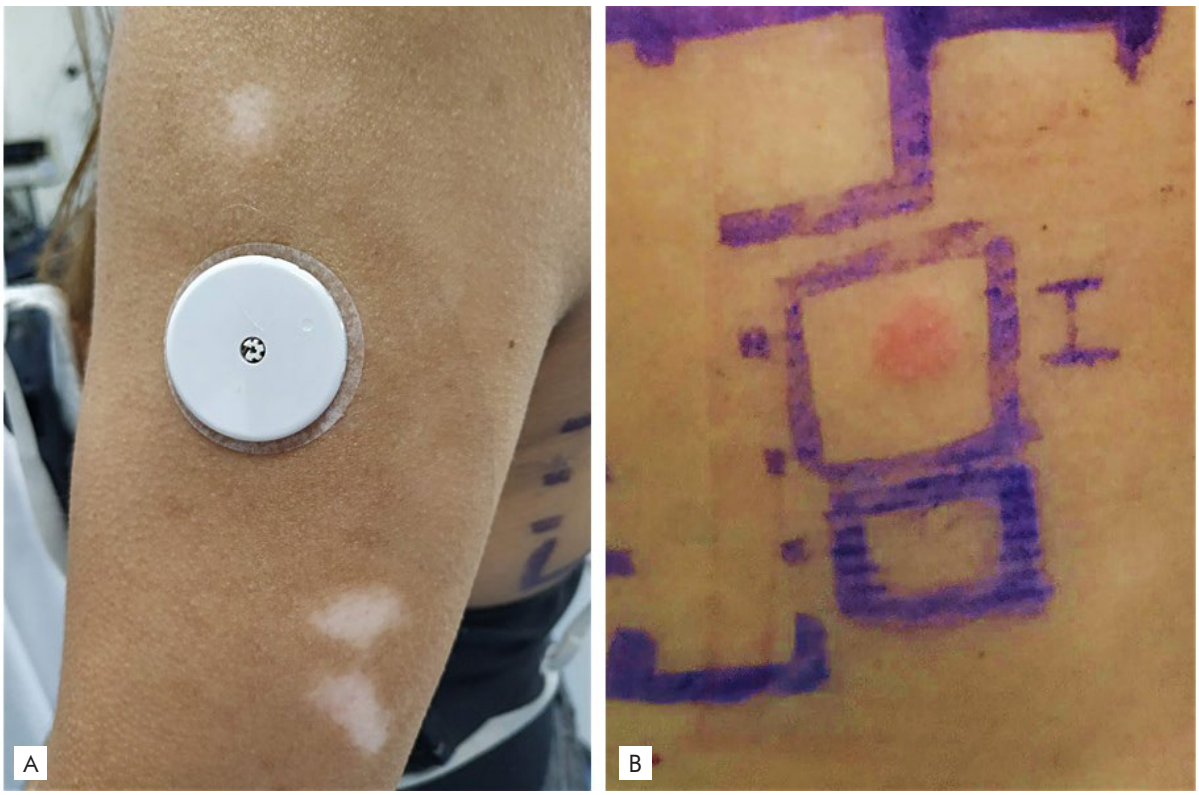

Figuras 1 - Leukoderma after ACD to the glucose sensor FreeStyle Libre A; **(A)** – clinical picture showing hypopigmented macules and patches on the outer side of the left arm; **(B)** – patch tests confirmed ACD by revealing a positive reaction (++) to IBOA on the first reading (D2).

patient also presented several hypopigmented macules and patches on the outer side of both arms, corresponding to the areas where the sensor had been applied (Fig.1A). She denied any personal or familiar history of vitiligo or atopy, and there were no similar lesions in the rest of the skin. She had not used other glucose sensors or insulin pumps and she also denied application of corticosteroids or other depigmenting agents.

Patch testing was performed with the Portuguese baseline series, acrylates series and plastic & glues series (Chemotechnique Diagnostics, Vellinge, Sweden), and also with a piece of the adhesive patch of the glucose sensor "as is", with methylhydroquinone 1.0% in pet., hydroquinone monobenzylether 1.0% pet. and with IBOA (purchased from Sigma-Aldrich and diluted 0.1% in pet. by the hospital pharmacy). Patch tests were performed on the upper back using IQ Ultra test chambers (Chemotechnique Diagnostics). Readings were performed on day 2 (D2) and D4, and patch test reactions were classified according to ESCD criteria.[2] A biopsy of one of the hypopigmented areas was concurrently undertaken.

Positive reactions on patch tests were observed only for IBOA (++), with no reaction to the fragment of the tape of the glucose sensor (Fig. 1B). Histopathology of a hypopigmented area showed a complete absence of epidermal melanocytes (Fig. 2A), which was confirmed by Fontana Masson staining (Fig. 2B).

The patient stopped using the sensor due to the cutaneous side effects, with a significant impact both in quality of life and in glycemic control. After 6 months of follow-up, she remains clinically stable, with no new lesions and awaiting transition to a new glucose sensor.

DISCUSSION

ACD to medical devices, including FreeStyle Libre®, is an increasingly recognized problem, posing a great challenge not only to patients suffering from this condition but also to clinicians dealing with them.[3] Nonetheless, to our knowledge, only one case of acquired leukoderma following sensitization to FreeStyle Libre® has been reported in the literature.[4]

Acquired leukoderma may occur in an area previously affected by ACD, and has been described in several medical devices with adhesives.[5] Regarding FreeStyle Libre®, IBOA does not seem to be the culprit substance, as it is not a recognized depigmenting agent.[1] Moreover, the occurrence of leukoderma along with ACD to FreeStyle Libre® is rare, arising the suspicion for other explanation beyond IBOA. In fact, it is hypothized that hydroquinone monomethyl ether (HMME) may be the responsible for this reaction.[4] HMME is a known depigmenting agent, and has even been responsible for cases of occupational leukoderma.[6] In this scenario, it is thought that HMME may have a direct toxic effect on melanocytes, potentially resulting in subclinical inflammation

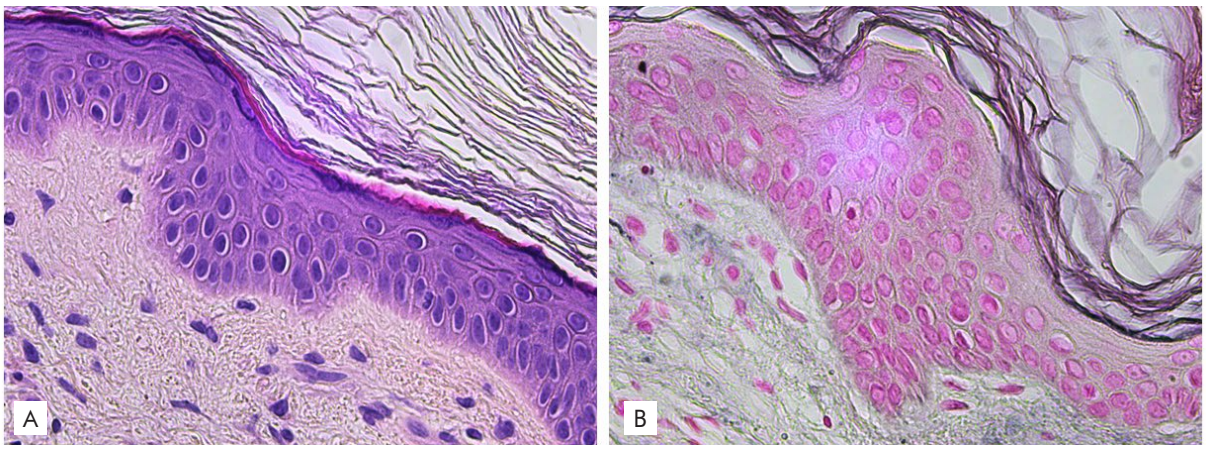

Figura 2 - Histological examination of the hypopigmented areas; **(A)** – Hematoxylin and eosin staining demonstrating an absence of epidermal melanocytes (x100). **(B)** – Fontana Masson staining confirmed and highlighted these findings (x100).

via melanocyte destruction.[4] This explains the histopathological findings in our patient, notably the absence of epidermal melanocytes.

Actually, HMME has been identified along with the IBOA in the sensor, where it acts as an inhibitor to prevent inadvertent IBOA polymerization. It is known that IBOA is not present in the adhesive part of FreeStyle Libre®; however, it originates from the plastic material of the sensor itself and subsequently diffuses through the plaster to the skin, a phenomenon probably added by occlusion and sweating.[7-9] Therefore, it is assumed that, in some instances, HMME may also migrate through the adhesive along with IBOA, resulting in a phenomenon of ACD with associated leukoderma, as in our patient.

Although rare, acquired leukoderma following ACD to FreeStyle Libre® can occur. Therefore, clinicians dealing with these patients should be alert to this possibility.

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