Allergic Contact Dermatitis with Diffuse Erythematous Reaction from Diisopropanolamine in a Compress

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Key Words

Allergic contact dermatitis · Diisopropanolamine · Compress · Diffuse erythematous reaction

Abstract

Compresses containing a nonsteroidal antiinflammatory drug (NSAID) are commonly used in Japan. However, this treatment may induce both allergic and photoallergic contact dermatitis from the NSAIDs and their ingredients. Here, we describe a case of allergic contact dermatitis with diffuse erythematous reaction due to diisopropanolamine in the applied compress. The absorption of diisopropanolamine might have been enhanced by the occlusive condition.

Introduction

Compresses containing a nonsteroidal antiinflammatory drug (NSAID) are frequently used in Japan. However, the style of the application may induce both allergic and photoallergic contact dermatitis from the NSAIDs and their ingredients [1–3]. We describe a case of allergic contact dermatitis with diffuse erythematous reaction caused by allergic sensitivity to a component, diisopropanolamine, of a compress used by the patient.

Case Report

An 87-year-old Japanese man with dementia presented with a pruritic eruption following the use of compresses for lumbago. The patient had used the same compresses for three weeks. During the last ten days of use, pruritic eruptions appeared on the bilateral lower back and upper buttock where the compresses were being applied. Then, diffuse erythema developed on the trunk and extremities. Physical examination revealed rectangular-shaped, pruritic exudative erythematous macular lesions on

the bilateral lower back and upper buttock and diffuse erythema on the chest, abdomen, back and extremities ([fig. 1](#)). The dermatitis was treated with topical steroids.

A patch test (International Contact Dermatitis Research Group criteria; Finn Chambers® on Scanpor® tape, Epitest Ltd., Tuusula, Finland) was performed with the compress' ingredients and the Japanese baseline series. The manufacturer provided the ingredients. The positive reactions at both 2 and 4 days after application were to diisopropanolamine 1% pet., fragrance mix 8% pet. (briall allergen GmbH, Greven, Germany), and mercuric chloride 0.05% aq. (Torii Pharmaceutical Co., Ltd., Tokyo, Japan) (+ on D2 and D4) ([fig. 2](#)).

Discussion

The patient showed allergic sensitivity to diisopropanolamine in the compresses he had used. We believe that sensitization occurred while using the compresses. Diisopropanolamine has a relatively low sensitization potential. It is used in emulsifying agents for cosmetic lotions, neutralizers in cosmetics, and bath preparations [1]. Until now, eight cases of allergic contact dermatitis from diisopropanolamine, including the present case, have been described ([table 1](#)) [1–6]. Notably, five of the eight cases were sensitized from using the compress [1–3]. The absorption of diisopropanolamine may have been enhanced by the occlusive condition.

We previously reported a case of diffuse erythematous reaction after using compresses [2]. In the previous case, three concomitant sensitizations to diisopropanolamine, felbinac, and crotamiton supposedly caused a diffuse erythematous reaction [2]. In the present case, a single sensitization to diisopropanolamine was associated with a diffuse erythema.

Thus, similar phenomena of allergic contact dermatitis with diffuse erythematous reaction may be caused by allergic sensitivity to a different component or different combinations of ingredients in the topical medicament. Patch testing with full ingredients from the manufacturer is essential for detecting the sensitized allergens in each case.

Table 1. Cases of allergic contact dermatitis due to diisopropanolamine

Case	Age/ sex	Clinical feature	Allergen(s)	Products used by the patient
Present case	87/M	rectangular-shaped, pruritic exudative erythematous macular lesions with diffuse erythema	diisopropanolamine	compress containing felbinac
Umebayashi, 2005 [1], 1st case	78/F	pruritic erythematous erythema	diisopropanolamine	compress containing felbinac
Umebayashi, 2005 [1], 2nd case	76/F	erythema and papules	diisopropanolamine	compress containing felbinac
Oiso et al., 2003 [2]	65/M	rectangular-shaped, pruritic exudative erythematous macular lesions with diffuse erythema	diisopropanolamine, felbinac, and crotamiton	compress containing felbinac
Umebayashi, 2000 [3]	45/M	rectangular-shaped, pruritic exudative erythema	diisopropanolamine	compress containing felbinac
Hosokawa et al., 1993 [4]	31/F	pruritic exudative erythema	ketoprofen and oxybenzone as photoallergens, and diisopropanolamine and polyoxyethyleneoreil eter as allergens	a topical lotion
Fujimoto et al., 1989 [5]	60/M	severely pruritic diffuse and edematous erythema	diisopropanolamine	a topical ointment
Cronin, 1980 [6]	?/F	?	diisopropanolamine	a blushing gel

Fig. 1. Rectangular-shaped erythema on the bilateral lower back and the buttock and a diffuse erythema on the trunk and extremities.

Fig. 2. Patch testing showed positive reaction to diisopropanolamine on day 4.

References

- 1 Umebayashi Y: Two cases of contact dermatitis due to diisopropanolamine. *J Dermatol* 2005;32:145–146.
- 2 Oiso N, Fukai K, Ishii M: Triple allergic contact sensitivities due to ferbinac, crotamiton and diisopropanolamine. *Contact Dermatitis* 2003;49:261–263.
- 3 Umebayashi Y: Contact dermatitis due to diisopropanolamine (in Japanese). *Rinsho Derma (Tokyo)* 2000;42:526–527.
- 4 Hosokawa K, Mitsuya K, Nishijima S, Horio T, Asada Y: Photocontact dermatitis from a non-steroidal anti-inflammatory drug (Sector Lotion®) (in Japanese). *Skin Research* 1993;35:26–32.
- 5 Fujimoto K, Hashimoto S, Kozuka T, Yoshikawa K: Contact dermatitis due to diisopropanolamine. *Contact Dermatitis* 1989;21:56.
- 6 Cronin E: *Ibid.* ref. [5], p. 149.