

Allergic contact dermatitis to pentylene glycol in a cosmetic cream

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Stefan Kerre

Department of Dermatology, Imelda Hospital, 2820 Bonheiden, Belgium

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Case Report

A 56-year-old female patient consulted because of a facial dermatitis with swelling of the eyelids since 1 week. This non-atopic patient without a dermatological history had been using toleriane riche cream (La Roche Posay Laboratories, La Roche Posay, France) since 1 month. She did not use any other products nor was she known with a history of contact allergy.

Patch testing was carried out with the European standard series, the Belgian cosmetic pharmaceutical series, and the toleriane riche cream. There was a 2+ reaction only to the cream toleriane riche.

2 months later, the patient was tested with the ingredients of this cream, which also remained negative. Meanwhile, the patient started to use L. Widmer body lotion, which also provoked a facial dermatitis. Patient was retested with the toleriane riche cream and the L. Widmer body lotion, which both provoked a 3+ reaction after 2 D. Because patch testing with the ingredients of the body lotion showed a 1+ reaction to propylene glycol (5% aqua), we retested the patient with pentylene glycol (5% in aqua), one of the ingredients of the toleriane riche cream. Although this test remained negative,

the repeated open application test (ROAT) with this ingredient was clearly positive after 3 days of application. 3 volunteers also performed the ROAT, which remained negative.

Discussion

Pentylene glycol (1,5-pentanediol) is a preservative, humectant, and solvent that shares similar properties with propylene glycol. Therefore, it is, like butylene glycol and hexylene glycol, used as an alternative for propylene glycol because it is considered to be less irritating and less allergenic.

However, allergic reactions to butylene glycol (1–3), hexylene glycol (4), and pentylene glycol (5) have been described before. Patch tests with butylene glycol, hexylene glycol, and pentylene glycol are usually carried out at a 5% concentration in water, which is proposed as the optimal concentration by Matsunga (6). Although the patient of Gallo even reacted to pentylene glycol at a concentration of 0.5% in aqua, our patient did not react to 5% in aqua. In view of our patient, a higher (10%) concentration should be considered.

This case report also illustrates the importance of the ROAT as a tool in detecting the causative allergen (7). Cross-reaction to propylene glycol in patients reacting to other glycols is a theoretical possibility but has never been observed in practice. This patient reacted to both propylene glycol and pentylene glycol.

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Address:
 Stefan Kerre
 Department of Dermatology
 Imelda Hospital
 2820 Bonheiden
 Belgium
 Tel: 0032 1656141
 Fax: 0032 16566141
 e-mail: stefan@kerre.com

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