pharmaceuticals and cosmetics labelled to be appropriate for 'sensitive' skin.

AUTHOR CONTRIBUTIONS

Valérie Beaulieu: Investigation; writing – original draft; writing – review and editing. **Ilaria Matei:** Writing – review and editing. **Nancy Hajjar:** Investigation; writing – review and editing. **Saskia Ingen-Housz-Oro:** Writing – review and editing. **Haudrey Assier:** Writing – review and editing; investigation; methodology; validation.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

INFORMED CONSENT

The authors obtained informed written consent from the patient for the photos to be used.

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REFERENCES

1. Ekstein SF, Warshaw EM. Sulfites: allergen of the year 2024. *Dermatitis*. 2023; Epub ahead of print. doi:10.1089/derm.2023.0154
2. Garcıa-Gavin J, Parente J, Goossens A. Allergic contact dermatitis caused by sodium metabisulfite: a challenging allergen. A case series and literature review. *Contact Dermatitis*. 2012;67:260-269.
3. Warshaw EM, Buonomo M, DeKoven JG, et al. Patch testing with sodium disulfite: north American contact dermatitis group experience, 2017 to 2018. *Contact Dermatitis*. 2021;85:285-296.
4. Oliveira A, Amaro C, Cardoso J. Allergic contact dermatitis caused by sodium metabisulphite in a cosmetic bleaching cream. *Australas J Dermatol*. 2015;56(2):144-145.
5. Madan V, Walker SL, Beck MH. Sodium metabisulfite allergy is common but is it relevant? *Contact Dermatitis*. 2007;57(3):173-176.
6. Oliphant T, Mitra A, Wilkinson M. Contact allergy to sodium sulfite and its relationship to sodium metabisulfite. *Contact Dermatitis*. 2012;66(3):128-130.

How to cite this article: Beaulieu V, Matei I, Hajjar N, Ingen-Housz-Oro S, Assier H. Acute allergic contact dermatitis caused by sulphites in a cosmetic and a pharmaceutical cream. *Contact Dermatitis*. 2024;90(3):312-314. doi:10.1111/cod.14468

Frequency of contact allergy to pentylene glycol. Retrospective cross-sectional study with data from the Società Italiana di Dermatologia Allergologica Professionale e Ambientale (SIDAPA)

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KEYWORDS: allergic contact dermatitis, cosmetics, cross-reactivity, patch test, pentylene glycol, propylene glycol

INTRODUCTION

Pentylene glycol (PTG) (1,2-pentanediol; 1,2-dihydroxy pentane; CAS no. 5343-92-0) is a preservative, solvent, and humectant that is increasingly used in cosmetic products as an alternative to propylene glycol (PG), compared to which it is considered a weaker irritant and allergen.[1] However, recent reports of allergic contact dermatitis (ACD) from PTG in cosmetics for sensitive skin and antiage creams suggest that its allergenic potential may be underestimated.[2–4]

Our objective was to evaluate the frequency of allergic contact sensitization to PTG compared to PG in consecutive patients undergoing patch testing for the suspicion of ACD.

METHODS

This retrospective cross-sectional study included patients from centres of the Società Italiana di Dermatologia Allergologica Professionale e Ambientale (SIDAPA) who, from March 2021 to July 2022, were consecutively patch tested with PTG in addition to the SIDAPA baseline series. Patch testing was performed according to the Italian guidelines.[5] Readings were done on day (D) D2 and D3, in some cases also on D4. PTG was tested at 5% and 10% aq. concentrations freshly prepared by dilution of a 50% stock solution obtained from Symrise (Holzminden, Germany). All patients were also patch tested with PG 5% pet and 30% aq.

RESULTS

A total of 1235 consecutive patients, 880 women and 355 men, mean age 51.10 ± 19.02 years, were patch tested for PTG and PG.

Allergic reactions to both 5% and 10% PTG were seen in five patients and to 10% PTG alone in two more patients. They were six females and one male, mean age 55.71 ± 12.53 years. The body areas involved were: face in two cases (plus neck in one of them), hands, neck, back, leg, and feet, respectively, in the remaining five cases. Overall, the clinical relevance was judged certain/likely in two patients, possible/doubtful in three patients, absent in two patients.

The sources of exposure to PTG in the two patients with certain/likely clinical relevance were face/body creams. The patients with possible/doubtful relevance had used leave on cosmetics (mainly face or body creams) that contained or might have contained PTG but it was not possible to establish a direct causal relationship.

Irritant reactions to both 5% and 10% PTG were seen in three patients and to 10% PTG alone in one patient.

As for PG, the 5% pet concentration gave no allergic or irritant reactions; the 30% concentration gave allergic reactions in 4 patients and irritant reactions in 11 patients. They were all males, mean age 52.25 ± 18.96 years. The body areas involved were oral mucosa, neck, back, and diffuse, respectively. The clinical relevance was judged certain/likely in two patients, possible/doubtful in one patient, absent in one patients. The sources of exposure to PG in the two patients with certain/likely clinical relevance were face/body/hand creams.

Overall, PTG gave 0.57% allergic reactions versus 0.32% irritant reactions, while PG gave 0.32% allergic reactions versus 0.89% irritant reactions. Only one patient showed simultaneous sensitization to PTG (5% and 10%) and PG (30%) with certain/probable relevance for ACD.

The intensity scores and clinical relevance of positive allergic reactions to PTG and PG are shown in Table 1.

DISCUSSION

PTG is an aliphatic alcohol with antibacterial properties that is increasingly used in "hypo-allergenic" cosmetic products as a solvent and humectant as a less irritant and less allergenic alternative to PG. The latter is a well-known contact sensitizer and it has long been included in patch test cosmetics/topical medicament series.[1] On the contrary, PTG is not commercially available as a patch test allergen. This may partly explain why reported cases of ACD from PG are not frequent[2–4,6–11] although it is suspected to be an emerging cosmetic allergen.[2,3]

Due to their similar chemical structure, cross-reactivity between PTG and PG could be expected, but has rarely been reported, indicating that PG would be a poor marker of ACD to PTG.

This is the first study that tries to statistically evaluate the allergenic potential of PTG and its degree of cross reactivity with PG. It also provides some information about the appropriate concentration for PTG to be used in patch tests.

Based on our results, PTG shows a prevalence of allergic reactions of 0.57% and would appear to be more allergenic and less irritating than PG. The 10% aq. concentration seems preferable to 5% aq.

TABLE 1 Intensity scores and clinical relevance of positive allergic reactions in patients sensitised to pentylene glycol (PTG) and/or propylene glycol.

	PTG			Propylene glycol		
Patient no. (sex, age)	5% aq.	10% aq.	Relevance	5% pet	30% aq.	Relevance
1 (M, 58)	+	+	Certain/likely	Neg.	+	Certain/likely
2 (F, 44)	+	+	Certain/likely	Neg.	Neg.	–
3 (F, 37)	++	++	Possible/doubtful	Neg.	Neg.	–
4 (F, 55)	++	++	Possible/doubtful	Neg.	Neg.	–
5 (F, 60)	Neg.	+	Possible/doubtful	Neg.	Neg.	–
6 (F, 76)	+++	+++	Absent	Neg.	Neg.	–
7 (F, 60)	Neg.	++		Neg.	Neg.	–
8 (M, 25)	Neg.	Neg.	–	Neg.	+	Certain/likely
9 (M, 69)	Neg.	Neg.	–	Neg.	+	Possible/doubtful
10 (M, 57)	Neg.	Neg.	–	Neg.	++	Absent

Our data seem to confirm that cross-reactivity between PTG and PG is infrequent, although the number of our cases is too low to draw definitely reliable conclusions. Further multi-centre studies are needed to verify our findings, and testing with higher concentrations of PG and late readings beyond D3/D4, essential in case of weak sensitizers, should also be considered.

In conclusion, we feel that PTG deserves to be considered as an audit allergen for the cosmetic series as it would allow the diagnosis of a relevant number of contact allergies that are not detectable with PG and that would otherwise be missed.

AUTHOR CONTRIBUTIONS

Rosella Gallo: Conceptualization; data curation; formal analysis; investigation; methodology; writing – original draft; writing – review and editing; supervision. **Fabrizio Guarneri:** Conceptualization; data curation; formal analysis; investigation; writing – review and editing; writing – original draft. **Silvia Mariel Ferrucci:** Data curation; investigation; validation; writing – review and editing. **Luca Stingeni:** Data curation; investigation; validation; writing – review and editing. **Katharina Hansel:** Data curation; investigation; validation; writing – review and editing. **Monica Corazza:** Investigation; validation; writing – review and editing; data curation. **Alessandro Borghi:** Data curation; investigation; validation; writing – review and editing. **Caterina Foti:** Data curation; investigation; validation; writing – review and editing. **Paolo Romita:** Data curation; investigation; validation; writing – review and editing. **Cataldo Patruno:** Data curation; investigation; validation; writing – review and editing. **Maddalena Napolitano:** Data curation; investigation; validation; writing – review and editing. **Nicole Morini:** Data curation; investigation. **Ilaria Trave:** Data curation; investigation. **Luigi Rigano:** Resources. **Aurora Parodi:** Validation; supervision; writing – review and editing.

CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

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REFERENCES

1. Goossens A. Contact-allergic reactions to cosmetics. *J Allergy (Cairo)*. 2011;2011:467071.
2. Gallo R, Russo R, Trave I, Murgioni F, Parodi A. Allergic contact dermatitis to pentylene glycol in an eye contour cream. *Contact Dermatitis*. 2020;82(4):254-255.
3. Corazza M, Schenetti C, Schettini N, Zedde P, Borghi A. Pentylene glycol: an emerging cosmetic allergen? *Contact Dermatitis*. 2022;86(1):44-46.
4. Seremet T, Aerts O, Walker A, et al. Allergic contact dermatitis from pentylene glycol in hypoallergenic eye cosmetics. *Contact Dermatitis*. 2023;88(1):73-75.
5. Stingeni L, Bianchi L, Hansel K, et al. Italian guidelines in patch testing-adapted from the European Society of Contact Dermatitis (ESCD). *G Ital Dermatol Venereol*. 2019;154(3):227-253.
6. Gallo R, Viglizzo G, Vecchio F, Parodi A. Allergic contact dermatitis from pentylene glycol in an emollient cream, with possible co-sensitization to resveratrol. *Contact Dermatitis*. 2003;48(3):176-177.
7. Hausen BM. Contact allergy to pentylene glycol. *Dermatitis*. 2007;18(2):99-100.
8. Amado A, Taylor JS, Murray DA, Reynolds JS. Contact dermatitis to pentylene glycol in a prescription cream for atopic dermatitis: case report. *Arch Dermatol*. 2008;144(6):810-812.

9. Kerre S. Allergic contact dermatitis to pentylene glycol in a cosmetic cream. *Contact Dermatitis*. 2008;58(2):122-123.
10. Foti C, Bonamonte D, Cassano N, Conserva A, Vena GA. Allergic contact dermatitis to propyl gallate and pentylene glycol in an emollient cream. *Australas J Dermatol*. 2010;51(2):147-148.
11. Mortz CG, Otkjaer A, Andersen KE. Allergic contact dermatitis to ethylhexylglycerin and pentylene glycol. *Contact Dermatitis*. 2009; 61(3):180.

How to cite this article: Gallo R, Guarneri F, Ferrucci SM, et al. Frequency of contact allergy to pentylene glycol. Retrospective cross-sectional study with data from the Società Italiana di Dermatologia Allergologica Professionale e Ambientale (SIDAPA). *Contact Dermatitis*. 2024;90(3): 314-317. doi:10.1111/cod.14469

Irritant hand dermatitis to alcohol hand sanitisers in healthcare workers: Possible role of alcohol metabolism polymorphisms

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KEYWORDS: alcohol-based hand sanitiser, hand dermatitis, irritant contact dermatitis, occupational contact dermatitis

CASES

Two healthcare workers (Case 1: female doctor of Chinese ethnicity; Case 2: male theatre nurse of Chinese-Filipino descent) presented with hand dermatitis. Case 1 reported a burning sensation within minutes of using alcohol-based hand sanitiser (ABHS), with notable improvement when not working. Both had no prior medical conditions, including eczema. Extensive patch testing, including to allergens found in healthcare settings, [Chemotechnique Diagnostics (Vellinge, Sweden) allergens in IQ chambers™, readings performed on day 2 and 4 according to ESCD guidelines] in both patients was negative (Table S1). Short contact patch testing (30 min under occlusion to ventral forearm) with SaniOne® ABHS (70% isopropyl alcohol) in both patients elicited erythema without associated symptoms. This resolved within several hours (Figure 1A). Case 1 performed further short contact patch testing to three other ABHS used (tested on dorsal forearm, rows 2–4 in Table 1, Figure 1B), with similar results. Both reported flushing following alcohol consumption. Avoidance of further use of ABHS by switching to hand washing resulted in complete resolution of hand dermatitis.

Twenty-five control healthcare workers (7 Caucasians of European descent, 14 Chinese, 2 Indians, 2 Malays and 1 Caribbean) were additionally tested to the same ABHS ($n = 10$) or Softa-Man® ($n = 15$) ABHS on the ventral forearm. One Chinese control was tested to both SaniOne® and Purell® ABHS (Table S2). Five individuals developed a positive reaction within 30 min of testing ($n = 1/7$ (14.3%) of European ancestry, $n = 4/14$ (28.6%) of Chinese ethnicity) (Figure 2). No statistical significance (Fisher's exact test,

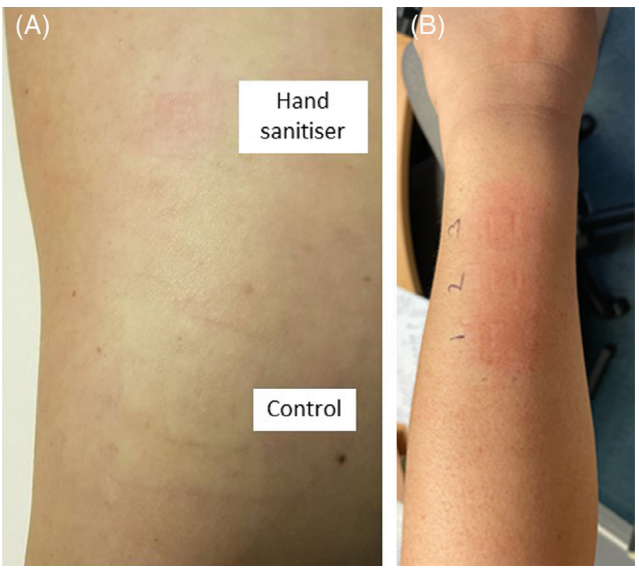

FIGURE 1 (A) Faint erythema at 30 min patch test to SaniOne® Instant Hand Sanitiser with no visible reaction at blank control site in Case 2. (B) Macular erythema extending beyond site of application on short contact patch test to 3 other alcohol-based hand sanitisers (1: ILOVE® hand cleaning gel; 2: Hu-Scrub®; 3: Creightons Pure Touch Hygiene Hand Gel) in Case 1.

Abbreviations: ABHS, alcohol-based hand sanitiser; ADH, alcohol dehydrogenase; ALDH, aldehyde dehydrogenase; ESCD, European Society of Contact Dermatitis.

†Deceased