

BRIEF REPORT

Suspected allergic contact dermatitis to iodopropynyl butylcarbamate in an alcohol hand rub commonly used in Australian health-care settings

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ABSTRACT

We report a case of suspected allergic contact dermatitis to the preservative and uncommon allergen iodopropynyl butylcarbamate, found in Microshield Angel hand gel, a skin cleanser commonly used in Australian health-care settings.

Key words: cleanser, contact allergy, gel, hand eczema, nurse, patch testing, preservative, scrub.

INTRODUCTION

Iodopropynyl butylcarbamate (IPBC) is a highly effective fungicide, parasiticide and bactericide with widespread application as a preservative in the industrial and consumer sector. Its use originated in the 1970s as a paint and wood preservative. It is now found in a variety of other industrial products, including building materials, metalworking fluids and cooling tower water, and personal care products, such as shampoos, skin washes, moist wipes, make up, contact lenses, sunscreens and baby products.^{1,2}

IPBC is an uncommon allergen and is a mild irritant at concentrations greater than 0.1%.³ We present a case of a medical practitioner whom we suspect developed allergic contact dermatitis involving her hands attributable to this allergen, from exposure to a commonly used skin cleanser; Microshield Angel hand gel.

CASE

A 54-year-old specialist medical practitioner presented with a 12-month history of hand dermatitis. Ten years previously she had presented for investigation of cheilitis triggered by lip balms. Patch testing performed at our institution at that time showed strong positive reactions to padimate O (2-ethylhexyl 4-dimethylaminobenzone), lanolin and Amerchol L101 (a chemical derivative of lanolin) (Amerchol, Edison, NJ, USA). The reactions to padimate O and lanolin were relevant to her exposure to lip balms.

She had a history of atopy, with mild eczema, hay fever and asthma, which was aggravated by cold air and exercise.

Her work included one ward round per week and patient consultations, with a repetitive use of an alcohol-based hand rub in between patients. At home she tried to avoid skin irritants by wearing non-powdered latex gloves as well as cotton-lined gloves when doing domestic work. She had a 2-year old toddler and endeavoured to use wet wipes that did not contain lanolin.

In the month prior to her presenting to our clinic, she thought that her hand dermatitis had improved with the use of 0.1% mometasone furoate ointment, time off work, as she was 34-weeks pregnant, and the avoidance of skin irritants. On examination, there were mainly post-inflammatory changes involving the dorsal aspects of both hands.

Patch testing was performed to the Australian Baseline Series (for details please contact Associate Professor Rosemary Nixon, rnixon@occdern.asn.au, Occupational Dermatology Research and Education Centre, 80 Drummond St Carlton, Victoria 3053, Australia), rubber chemicals, anti-septics, ingredients of creams and hand care products, and to samples of her own products. Testing was performed using Finn Chambers on Scanpor Tape (SmartPractice, Phoenix, AZ, USA) applied to the patient's back for 48 hours. Tests were read at day 2, 4 and 7. A test to latex was negative.

Abbreviations:

IPBC	iodopropynyl butylcarbamate
ROAT	repeated open application test

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A positive reaction to Amerchol L101 occurred on day 4. In addition, a late positive reaction (1+) on day 7 occurred to 0.1% IPBC tested as part of the Australian Baseline Series. At this stage the clinical relevance of this reaction was uncertain, as there was no known history of exposure. However, given the timing, it was considered to be a true allergic reaction and far less likely to be an irritant reaction. The patient was advised to check whether any of the products she had used on her skin contained IPBC. The diagnoses made at that stage were: (i) irritant contact dermatitis from wet work (ii) allergy to IPBC and Amerchol L101; no current relevance.

Two weeks later a text message arrived from the maternity ward featuring the label of Microshield Angel (Johnson and Johnson Medical, North Ryde, New South Wales, Australia) hand gel. The patient had realised that IPBC was a constituent of this product, which she had been using regularly on ward rounds and had not brought in for testing. Subsequently, she has avoided Microshield Angel hand gel and had no further skin problems.

To assist with assessing the clinical relevance of this finding the patient was sent a sample of Microshield Angel hand gel to perform a repeated open application test (ROAT). The ROAT involved twice daily application of Microshield Angel to the same area of skin of the upper arm. This failed to produce a cutaneous reaction, according to the patient, but what does this mean?

ROAT has been shown to be more sensitive than patch tests when the same concentration of allergen is used per dose of the ROAT as the patch test.⁴⁻⁶ However, when the accumulated dose of allergen with the ROAT is equal to the patch test dose the skin's response has been shown to be an equal^{4,5} or lesser reaction.⁶ In the case of a lesser reaction, it was hypothesised that there was some evaporation of the allergen with its open application, and thus a lower total dose was absorbed than in the occluded patch test. It appears that the accumulated absorbed dose is a pivotal factor in whether the elicitation threshold for allergic contact dermatitis to occur is reached.⁴⁻⁶ We hypothesise that the accumulated absorbed dose of IPBC from applying Microshield Angel to the intact skin of the upper arm for twice a day for 10 days would be considerably less than applying it to skin on hands that has had its integrity disrupted by exposure to multiple irritants. Johansen and colleagues ROAT-tested 14 patients, with positive patch tests to fragrance mix to the deodorants identified by the patients to be causing their rash. Only 18 of the 36 tests produced a reaction.⁷ It is plausible that our patient's use of Microshield Angel on her hands resulted in sufficient exposure to IPBC to meet the elicitation threshold, however ROAT testing did not.

Despite the negative ROAT to Microshield Angel hand gel, we suspect that a delayed type IV hypersensitivity to IPBC in the Microshield Angel gel contributed to the exacerbation of this patient's hand dermatitis, given the temporal relationship between the use of this product and the exacerbation of her contact dermatitis, the subsequent improvement with

the cessation of its use and the positive patch test to IPBC. She is currently tolerating the use of other brands of alcohol hand rubs. The diagnoses were amended to: (i) allergic contact dermatitis to IPBC in Microshield Angel hand gel; (ii) irritant contact dermatitis from wet work.

CONCLUSION

We have tested 5427 patients from the Contact Clinic and the Occupational Dermatology Clinic at the Skin and Cancer Foundation Victoria to IPBC since testing to this allergen was commenced in 2000. There were 30 positive patch test reactions to IPBC (0.55%). This relatively low rate of reactions is consistent with results from other centres, which have reported positive patch test reactions to 0.1% IPBC in 0.2–0.7% of patients tested.⁵ A number of case reports have been made of allergic contact dermatitis to IPBC from exposure to cosmetic cleansing wipes,⁸ moisturiser,⁹ sanitary wipes,¹⁰ treated wood¹¹ and airborne exposure to paints.¹² Although IPBC remains an uncommon contact allergen, practitioners should be aware that it is currently present in Microshield Angel hand gel, which is commonly used by many health-care workers in Australia.

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