

BRIEF REPORT

Pediatric Dermatology 1–2, 2012

ALLERGIC CONTACT DERMATITIS TO GAMMA-IRRADIATED WEBCOL ALCOHOL PREP PADS

Abstract: We report a case of allergic contact dermatitis to WEBCOL[®] alcohol prep pads in a healthy 17-year-old girl who showed no reaction to the individual components of the prep pads upon provocative use testing. Although several case reports have described allergic contact dermatitis to isopropyl alcohol, there have been no reports of allergic contact dermatitis to alcohol prep pads sterilized with gamma irradiation, a common sterilization technique capable of producing volatile products in this type of alcohol prep pad.

INTRODUCTION

A 17-year-old girl with no significant past medical history presented with a 3-year history of delayed, pruritic eruptions at sites of venipuncture or vaccine administration. The eruptions occurred approximately 2 days after the intervention, lasted for 1 week, and then resolved without treatment. WEBCOL (Kendall, Mansfield, MA, USA, 70% isopropyl alcohol, No. 6818) alcohol prep pads were used to clean the skin before the reactions, so suspicion was raised of an allergic contact dermatitis to these pads.

METHODS AND RESULTS

Provocative use testing on both volar forearms was performed (Fig. 1) consisting of a single application of the test agent directly to the skin without occlusion. The patient was instructed to refrain from washing the area for 12 hours, and test results were read after 48 hours. Individual components of the alcohol prep pad were tested, including the unaltered pad (Fig. 1D), liquid extracted from the pad (Fig. 1A), and the interior portion of the package wetted with sterile water (Fig. 1B). Isopropyl alcohol diluted to 70% with distilled water (Fig. 1C) was also tested alongside the individual components of the alcohol prep pad. The pad and its liquid produced reactions, whereas the package and the puri-

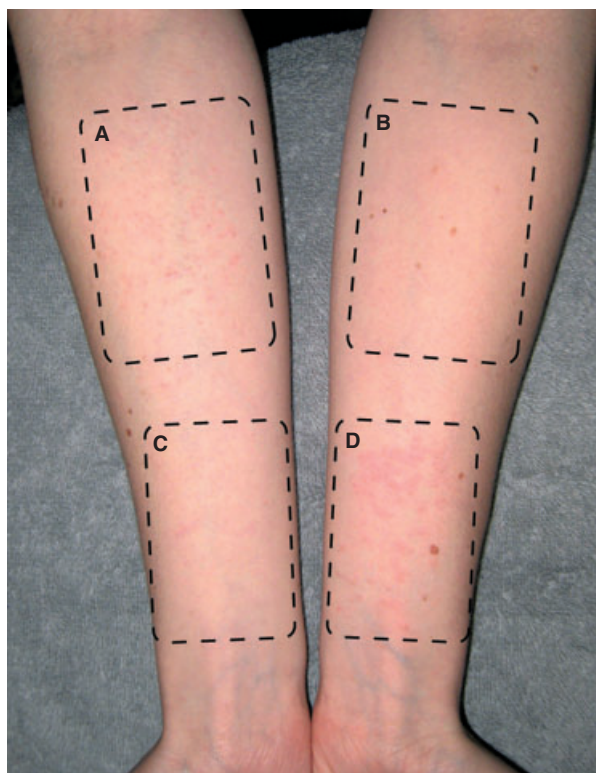


Figure 1. Allergic contact dermatitis to gamma-irradiated WEBCOL alcohol prep pads evoked by provocative use testing on the volar aspects of forearms. Clinical photograph taken 48 hours after application of (A) liquid extracted from the pad, (B) the interior portion of the package wetted with sterile water, (C) isopropyl alcohol diluted to 70% with distilled water, and (D) an unaltered pad immediately after opening package.

fied 70% isopropyl alcohol did not, suggesting that the liquid impregnating the pad was responsible. Testing with washed pads saturated with sterile water or pure 70% isopropyl alcohol was negative (Table 1), indicating that the pad liquid and not the pad material was responsible.

DISCUSSION

Rare reports of positive patch tests to isopropyl alcohol have been published (1–7). More recent reports identified propylene oxide, a compound used in sterilization, as an agent implicated in allergic contact dermatitis to individually packaged isopropyl alcohol swabs (2,8). Shorter reports have described contact allergies to commercially available isopropyl alcohol swabs without more specific testing for the etiologic agent (9,10).

As with this case, some reports of allergic contact dermatitis to individually packaged isopropyl alcohol swabs failed to reproduce positive patch tests to isopropyl alcohol or the other components of the swab (11).

DOI: 10.1111/j.1525-1470.2012.01727.x

TABLE 1. *Provocative Use Test Results for Components of Alcohol Prep Pad*

Pad, as supplied by manufacturer (Fig. 1D)	++
Liquid extracted from the pad (Fig. 1A)	++
Package: aluminum layer on an oriented polypropylene film (Fig. 1B)	–
Pure 70% isopropyl alcohol (Fig. 1C)	–
Pad: non-woven polyester rayon blend	
Saturated with sterile water	–
Saturated with purified 70% isopropyl alcohol	–

++ moderate hypersensitivity reaction; – no reaction

One study used liquid and gas chromatography to precisely identify, isolate, and then test the individual components of the swabs, still failing to demonstrate positive patch tests (12). These studies demonstrated that isopropyl alcohol swabs as a whole caused allergic contact dermatitis, rather than their individual parts, a phenomenon known as compound allergy.

In contrast to the alcohol pads sterilized with propylene oxide (2,8), WEBCOL alcohol prep pads are sterilized with gamma irradiation. Polypropylene, a major component of the packaging, is a stable polymer of propylene and is not thought to be an allergen, although it degrades into volatile radiolysis products when exposed to gamma irradiation, specifically phenol-type antioxidants that are retained for long periods of time (13,14). Although it is possible that our report reflects a compound allergy, we speculate that gamma irradiation may create a new allergen that is retained in the WEBCOL product. Although safe and widely used, gamma irradiation may have unintended effects on polymers in creating volatile radiolysis products that could play a role in allergic contact dermatitis in certain patients.

ACKNOWLEDGMENTS

The authors would like to thank Dr. David E. Cohen for advice and discussion of the case.

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