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Mainwaring, Walker
Zhao, Johnny
Hunt, Raegan

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Allergic contact dermatitis related to homemade slime: a case and review of the literature

Walker Mainwaring¹ BA, Johnny Zhao² MD, Raegan Hunt³ MD PhD

Affiliations: ¹Baylor College of Medicine, Houston, Texas, USA, ²Department of Dermatology, Baylor College of Medicine, Houston, Texas, USA, ³Department of Dermatology, Texas Children's Hospital, Baylor College of Medicine, Houston, Texas, USA

Corresponding Author: Walker Mainwaring BA, 1136 Berthea, Houston, Texas 77006, Tel: 9157270165, Email: walker.mainwaring@bcm.edu

Abstract

Slime has become extremely popular as a children's toy in recent years and is typically made with various household substances. Although reports of slime causing skin irritation are not uncommon, case reports of slime-induced allergic contact dermatitis have only recently surfaced. We present a case of a child with hand dermatitis, history of exposure to slime, and positive allergen patch testing to two ingredients found in slime. The case underscores the need for clinicians to be aware of slime as a possible cause of allergic contact dermatitis in children. Given the trend of newly-reported cases, we briefly review the current literature to date.

Keywords: pediatric, contact dermatitis, allergic contact dermatitis, patch testing

Introduction

Slime is a viscous substance that is typically made with household products such as glue and borax, though recipes found online are variable. Making and playing with "slime" has become extremely popular among today's youth, who can customize their own varieties by adding different ingredients to alter its color or texture. The handling of the ingredients used to make slime is not without risk, however, and media reports on slime causing skin irritation are not uncommon. However, there is still relatively little literature on slime-induced dermatitis. We present a case of slime-induced allergic contact dermatitis and review the reported cases to date.

Case Synopsis

An 11-year-old girl with atopic dermatitis was referred to the dermatology clinic for severe,



Figure 1. Sample of homemade slime that the patient made using white glue, glitter, shaving cream, artificial food color, and borax (sodium tetraborate).

worsening hand dermatitis. Her mother reported that the patient began playing with homemade slime (**Figure 1**) several weeks before the onset of this eruption. Examination showed erythematous papules and plaques, as well as vesicles and fissures on bilateral palms and fingers (**Figure 2**). The differential diagnosis included dyshidrotic eczema, irritant contact dermatitis, and allergic contact dermatitis. She was treated with ultrapotent topical corticosteroids with wet wraps and advised to refrain from playing with slime. Over the next several months, she returned for two flares of the same condition. The pruritic rash was poorly responsive to ultrapotent topical corticosteroids with wet wraps and she required two oral corticosteroid tapers, which resulted in prompt clearance. Playing with slime was associated with each flare. Therefore, patch testing was performed with the T.R.U.E Test (Smart Practice Dermatology/Allergy, Phoenix, AZ, USA.). Results at 96-hours showed a 3+ (strong vesicular) reaction to methylchloroisothiazolinone/ methylisothiazolinone (MCI/MI) and a 1+ (weak papular) reaction to quaternium-15 (**Figure 3**).

The patient's slime recipe included white glue, glitter, shaving cream, artificial food color, and borax



Figure 2. Vesicles, fissures, and erythematous papules and plaques on bilateral palms and fingers



Figure 3. Results of patch testing demonstrating 3+ (strong vesicular) reaction to methylchloroisothiazolinone/ methylisothiazolinone (MCI/MI, above) and 1+ (weak papular) reaction to quaternium-15 (below).

(sodium tetraborate). The manufacturer of the white glue, which the patient used to create her slime confirmed that it contains MCI/MI (personal correspondence). The shaving cream she used did not contain either MCI/MI or quaternium-15.

At initial follow-up, the patient's hands were clear. She was counseled to avoid MCI/MI and quaternium-15 containing products, including slime, and at further visits she has had no recurrences of hand dermatitis.

Case Discussion

In addition to MCI/MI found in white glue, slime contains several chemicals that may irritate or cause a type IV hypersensitivity contact dermatitis of the skin. Borax, with a pH of approximately 9.5, is a known skin irritant [1]. Shaving creams may contain sodium lauryl sulfate, a surfactant which commonly causes irritant contact dermatitis, as well as contact allergens such as fragrance, benzophenone-4, diazolidinyl urea, imidazolidinyl urea, and quaternium-15 [2, 3].

There have been seven prior case reports of contact dermatitis from slime use (encompassing ten total patients), including one report on dermatitis resulting from a "noise putty" [4], (**Table 1**). Patch testing was performed for four patients and a strong reaction to MCI/MI was recorded for three out of those four patients [4-6]. Fragrance mix and parabens were two other reported contact allergens. In the cases in which patch testing was performed, patients were counseled to avoid MCI/MI containing

products (including slime recipes that include MCI/MI), whereas the patients that did not undergo patch testing were generally counseled to avoid slime in general [4-10]. The importance of patch testing in these cases is essential. Recipes for slime without borax or glue can be found online, so contact allergens such as MCI can be avoided. Therefore, patch testing may potentially allow patients to continue making slime while avoiding allergens.

Conclusion

Our case emphasizes both the need to be aware of slime as a possible cause of allergic contact dermatitis and the utility of patch testing in identifying ingredients to avoid so children can continue playing with slime.

Potential conflicts of interest

The authors declare no conflicts of interests.

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Table 1. Review of published case reports of dermatitis induced by slime or similar products.

Publication [Reference number]	Patient(s)	Presentation	Patch testing performed?	Test results pertaining to slime	Treatment
Aerts et al. [5]	Case 1: 11 yo girl Case 2: 9 yo boy	Several-month history of vesicular hand dermatitis following contact with slime in both cases	Yes	Case 1: MCI/MI .02% (2+), MI .2% (+), Bouncing Putty gel (+) Case 2: Paraben mix 16% (2+), fragrance mix (?+)	Corticosteroids and avoidance of tested allergens
Heller et al. [8]	Case 1: 7 yo girl Case 2: 10 yo girl	Case 1: One day of pain and irritation of hands, with redness and peeling of palms after playing with slime the day before Case 2: Itchy and sometimes painful eruption on palms after playing with slime over the 4 days prior to symptom onset	No		Case 1: Topical triamcinolone ointment and avoidance of slime Case 2: Topical desoximetasone ointment and avoidance of slime
Gittler et al. [7]	9 yo girl	5-month duration of pruritic hand dermatitis coinciding with contact with slime	No		High-potency topical corticosteroids, frequent application of bland emollients, and avoidance of slime
Zhang et al. [6]	10 yo girl	1.5-year history of light pink, pruritic, eczematous papules and plaques on the distal dorsal and palmar fingers after daily contact with slime	Yes	MCI/MI .01% (2+), MI .2% (+), three slime samples (+)	Avoidance of MCI/MI-containing products and use of gloves while handling slime
Ducharme et al. [4]	7 yo boy	1-year history of recalcitrant chronic hand dermatitis	Yes	MI 2000 ppm (2+), MCI/MI 200:100 ppm (2+), manufactured "noise putty" (2+), fragrance mix 18% (weak positive reaction)	Avoidance of MCI/MI and noise putty
Kondratuk et al. [9]	Case 1: 12 yo girl Case 2: 13 yo girl	Case 1: 7-month history of hand dermatitis culminating in weeping blisters, skin-colored papules and vesicles with erosions and serous drainage involving the dorsal right hand Case 2: Several-month history of lichenification, erosions, and hemorrhagic crusts of right hand more than the left hand	No		Case 1: Cephalexin, topical mupirocin ointment, and triamcinolone ointment Case 2: No treatment listed
Piazza et al. [10]	11 yo girl	1-year history of erythema, vesicles, and exulcerations on the dorsal aspect of six fingers	No		Moisturizing cream and mometasone cream

yo: year-old