

Short Communication

Allergic contact dermatitis due to phenol-formaldehyde resin and benzoyl peroxide in swimming goggles

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Contact dermatitis due to swimming goggles has implicated dibutylthiourea as a component of the rubber accelerator in black neoprene rubber (1) and a variety of accelerators in black rubber (2). A raccoon-like periorbital leukoderma, thought to be a toxic reaction rather than an allergic contact dermatitis due to neoprene rubber or glue, has also been described associated with wearing swimming goggles (3).

Case Report

A 12-year-old girl presented with a 12-month history of an itchy, red periorbital rash associated with the wearing of her swimming goggles, which improved by their avoidance for a 2-week period. There was no past history of eczema, asthma or hay fever. On examination, there was a well-demarcated erythematous scaly rash in the periorbital area (Fig. 1).

She was patch tested to European standard, corticosteroids, and plastics and glues series, and samples of the foam rubber part of the swimming goggles, including both the inner cushioned side and the outer 'glued' side.



Fig. 1. Periorbital eczema at site of contact with swimming goggles.

The results were read at 2 and 4 days according to ICDRG recommendations.

She reacted to the following at 4 days:

benzoyl peroxide (1% pet.)	++
phenol-formaldehyde resin (5% pet.)	++
para-tertiary-butylphenol-formaldehyde resin (PTBPF 1% pet.)	-
rubber cushion, outer 'glued' side	++
rubber cushion, inner side	++

Patch tests to the rubber mixes were all negative. Unsuccessful attempts were made to gain further information about the constituent materials of the goggles.

Comment

Phenol-formaldehyde resin

Formaldehyde is combined with various phenols to produce a number of phenol-formaldehyde resins. They are utilised in many glues and used as vulcanizing or curing agents in rubber modification (4). Phenol-formaldehyde resins have been shown to cause both irritant and allergic contact dermatitis (5), and usually as a component of a rubber glue (6, 7). Para-tertiary-butylphenol-formaldehyde (PTBPF) resin is included in the European standard series, as it is a common sensitizer. However, it has been shown that patch testing with PTBPF resin alone will not identify patients with contact allergy to phenol-formaldehyde resins (8, 9).

Benzoyl peroxide

Benzoyl peroxide has antimicrobial and keratolytic properties useful in acne and leg ulcer preparations (10), but it too may be used as a cross-linking agent in the curing process of rubber (4). Irritant and allergic contact dermatitis from benzoyl peroxide has been described, but most commonly in patients treated for chronic leg ulcers (11). This case demonstrates allergic contact dermatitis due to phenol-formaldehyde resin and benzoyl peroxide, which we believe to be constituents of the rubber or glue in a pair of swimming goggles. It highlights that PTBPF in the European standard series may not be sufficient to exclude contact allergy to phenol-formaldehyde

hyde resins. Patients should have additional patch tests with phenol-formaldehyde resins, resol and novolac, 5% pet. (Hermal).

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