patient developed occupational dermatitis from butylene glycol in a soap (9, 10). 2 large-scale group studies, including 364 and 272 patients, give frequencies of contact allergy to 1,3-butylene glycol of 0.4% and 1.1%, respectively, of patients tested (1, 2).

Although 1,3-butylene glycol has been considered a safe cosmetic ingredient and a rare contact allergen, we suggest that allergy to it would be reported more frequently if it were tested regularly. 1,3-butylene glycol (5% aq.) is now being added to the Belgian cosmetics series to evaluate the incidence of positive tests and the incidence of possible cross-reactivity with propylene glycol, the latter having been present in the Belgian standard series since 1993. 5% aq. has been proposed as optimal for patch testing by Matsunaga et al. (1), though we did not observe irritant reactions to 10% aq. in 20 control subjects.

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An outbreak of occupational textile dye dermatitis from Disperse Blue 106

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Key words: textile dyes; allergic contact dermatitis; patch tests; occupational; Disperse Blue 106; Disperse Blue 124; thin-layer chromatography; cross-sensitivity.

Textile dyes can be responsible for as many as 5.8% of sensitizations detected in contact dermatitis clinics (1–3), but occupational sensitization is rarely reported.

Patients and Methods

5 women, aged 25 to 34 years, worked in a ready-to-wear shop and presented with 3-month histories of eczema of the axillae, neck, upper extremities, anterior abdominal wall, and, sometimes, the face. The garment suspected was a dark blue smock, introduced as a working uniform in the last 4 months and worn by about 200 employees.

Table 1. Disperse dye mixes used in the Portuguese standard series

	8% mix	3.2% mix
Disperse Orange 1	1% pet.	0.5% pet.
Disperse Orange 3	1% pet.	0.5% pet.
Disperse Yellow 3	1% pet.	0.5% pet.
Disperse Red 1	1% pet.	0.5% pet.
Disperse Red 17	1% pet.	0.5% pet.
Disperse Blue 35	1% pet.	0.5% pet.
Disperse Blue 106	1% pet.	0.1% pet.
Disperse Blue 124	1% pet.	0.1% pet.

All 5 patients were patch tested with the Portuguese standard series, which includes 2 mixes of 8 disperse dyes (Table 1) (4). They were also tested with pieces of the suspected garment and a modified and extended textile series, including 33 dyes. Patch testing was performed with Finn Chambers™ on Scanpor™ tape, with readings according to ICDRG recommendations.

To characterize the suspected garment, textile fiber composition was obtained from the manufacturer, and thin-layer chromatographic (TLC) analysis was performed on a sample of the smock.

Results

All 5 patients had positive reactions to both disperse dye mixes (Table 1), as well as to pieces of the smock, and subsequently to Disperse Blue 106 and 124. Further patch test results and patient characteristics are summarized in Table 2.

TLC of the garment sample identified 2 azo dyes, Disperse Blue 106 and Disperse Red 1. Textile fiber compo-

Table 2. Patient clinical data and patch test results

Patient no.	Age (years)	Sites	Standard series	Dyes positive
1	34	axillae neck upper chest hands (dorsum) eyelids	fragrance mix Myroxylon Pereirae MCI+MI dye mix 3.2% dye mix 8% piece of garment	DB 106 DB 124
2[A]	25	axillae neck upper chest abdominal wall face	nickel dye mix 3.2% dye mix 8% piece of garment	DB 106 DB 124 DY 3 DR 1 and DR 17 DB 35 DY 9 and DY 64
3[B]	34	neck hands (dorsum) antecubital fold forearm	nickel dye mix 3.2% dye mix 8% piece of garment	DB 106 DB 124 DB 7
4[A,B]	34	neck forearm	dye mix 3.2% dye mix 8% piece of garment	DB 106 DB 124 DB 7
5[B]	34	neck fists	nickel formaldehyde dye mix 3.2% dye mix 8% piece of garment	DB 106 DB 124

DB=Disperse Blue; DR=Disperse Red; DY=Disperse Yellow.
[A] (Patient nos. 2 and 4): personal history of atopy.
[B] (Patient nos. 3 to 5): less extensive dermatitis, due to protective sweatshirt underneath the suspected garment.

sition, as submitted by the manufacturer, was a mixture of synthetic acetate and polyamide.

Discussion

Only around 30 disperse dyes are implicated in about 90% of reported textile dye dermatitis (1). Disperse Blue 106 was 1st reported in 1985 as causing textile allergy in 9 patients (5), dark blouses being the offending garment (5, 6). Other reports have since been published implicating blue synthetic garments containing such dye (3, 7–9).

The chromatographic analysis performed identified Disperse Blue 106. The simultaneous reaction in all patients to the weaker, but similar, allergen, Disperse Blue 124, is seen as a cross-reaction (6, 10), though patients sensitized to Disperse Blue 124 do not always cross-react with Disperse Blue 106 (11, 12).

Our results confirm the inability of PPD to serve as a screening allergen for azo dye allergy (6–13). Patient no. 2 (Table 2) showed positive reactions to 8 dyes of 4 different chemical classes (5 azo, 1 anthraquinone, 1 nitroarylamine and 1 quinoline), which could be interpreted either as multisensitization or as excited skin syndrome. Patient no. 2 also had a positive patch test to Disperse Yellow 64, for which only 1 previous reference was found (14). Patient no. 5 had a positive reaction to formaldehyde, but no reaction to any of the resins included in the textile series.

To the best of our knowledge, this is the 1st report of occupational sensitization to Disperse Blue 106.

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