

Short Communication

Allergic contact dermatitis from 2-chloro-p-phenylenediamine in a cream dye for eyelashes and eyebrows

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p-phenylenediamine (PPD) dye derivatives are common sensitizers among hairdressers and their clients. 2-chloro-p-phenylenediamine (chloro-PPD, CAS 615–66–7) is used for semipermanent colouring of the lashes and the brows. What we believe to be the first 2 cases of allergic contact dermatitis from this substance are reported here (Fig. 1).

Case Reports

Case no. 1

A 29-year-old woman was referred with an eczematous reaction after use of a cream dye on her lashes and brows. She had used the same product for several years without any side-effects. The colour was semipermanent and applied only 4× a year. She had developed an intensely itchy dermatitis at her brows but not at her lashes, despite these having been coloured at the same time. After treatment with corticosteroids, the dermatitis disappeared within a week. After that, she never used the cream dye again and no relapse occurred.

Case no. 2

A 30-year-old woman was also referred with an eczematous reaction after use of a cream dye on her lashes and brows. She used to regularly colour her lashes and brows. The last 2×, she had developed an itchy dermatitis on her eyelids, which had disappeared within a few weeks without treatment.

Both cases were patch tested with the European standard series and PPD derivatives used for hair colouring, as well as their own cream dyes and constituents, includ-

ing chloro-PPD. At D3, case no. 1 had a +++ reaction to chloro-PPD (1% pet.) and a ++ reaction to the cream dye as is. She also had a + reaction to PPD but no reaction to the other derivatives or metabolites of PPD tested. Case no. 2 showed at D3 a +++ reaction to chloro-PPD, a +++ reaction to PPD, and a +++ reaction to the cream dye as is. She also had a ++ reaction to 2,5-diaminotoluene sulfate and a + reaction to nitro-PPD (Table 1).

No further positive reactions were found at D7 (not shown). 10 controls were negative to the chloro-PPD test.

Discussion

There are many reports of cross-sensitivity among PPD derivatives. The possibility of a common hapten has been discussed, with the substituent on nitrogen which can be lost at oxidation (1). Furthermore, cross-reactivities between azo dyes in clothes and PPD have been proposed, though in some cases, chemical reactions could explain concomitant reactions (2). However, chloro-PPD as well as most other hair-colouring PPD-derivatives have their substituents covalently bound to the

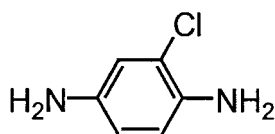


Fig. 1. 2-chloro-p-phenylenediamine.

Table 1. PPD derivatives and metabolites tested (D3 readings)

Allergen	Concentration	Case no. 1	Case no. 2
PPD	1% pet.	+	+++
PPD	0.090 mg/cm ²	+	NT
2-chloro-PPD	1% pet.	+++	+++
cream dye	as is	++	+++
PPD mix	0.075 mg/cm ²	–	NT
PPD mix	0.6% pet	NT	–
2,5-diaminotoluene sulfate	1% pet.	–	++
2-nitro-PPD	1% pet.	–	+
3-aminophenol	1% pet.	–	–
4-aminophenol	1% pet.	–	–
hydroquinone	1% pet.	–	–

aromatic ring, and concomitant reactions to these PPD derivatives are probably due to cross-sensitivity. When patients sensitized to PPD were patch tested to an extensive series of PPD derivatives (3), some were positive to chloro-PPD without their having had any previous exposure.

Case no. 1 showed severe dermatitis at the brows but no reaction at the lashes. We think that this is explained by the greater risk of unintentional skin contact when colouring the brows than when colouring the lashes. Both patients reacted to cream dyes containing chloro-PPD according to the manufacturer. In case no. 1, no PPD was present in the cream; in case no. 2, no such information was available.

References

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