Severe immediate hypersensitivity and allergic contact dermatitis caused by hair dyes

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Allergic hypersensitivity reactions induced by hair dyes mainly occur in the form of allergic contact dermatitis (1). We describe a case in which both delayed hypersensitivity (DHS) and immediate hypersensitivity (IHS) to hair dyes are associated.

Case Report

A 43-year-old female experienced dermatitis of the scalp and neck after each hair colouring, which was carried out every 6 weeks. She had no medical history and had never had any temporary black henna tattoo. In August 2010, the application of hair dye provoked an immediate pruritus of the scalp, with a malaise that lasted for 15 min. During the following hair dye procedure, a severe reaction occurred, with generalized pruritus and erythema, dyspnoea, vomiting, and hypotonia. The symptoms disappeared over a 2-hr period at home. The usual contact dermatitis appeared thereafter, and lasted for 8 days.

The skin tests were performed under strict medical monitoring, with the consent of the patient, who had an intravenous access. The open tests were first applied for 30 seconds and read at 20 min. The results were doubtful (localized pruritus) for the hair dye (mixture of colouring cream with an oxidant, 1:1) and negative for the colouring cream and the developer tested separately. Then, open tests were applied and read at 20 min. The results were positive (strong localized urticarial reaction) for the hair dye and negative for the colouring cream, the developer, and the individual components. Among the components of the colouring cream mixed with the developer (1:1), only oxidized 2,4-diaminophenoxyethanol-HCl was positive in an open test at 20 min. Patch tests read at 72 hr gave ++ positive reactions for p-phenylenediamine base (PPD; 1% pet.) and for toluene-2,5-diamine (TDA; 1% pet.). Permanent oxidation hair dyes were therefore absolutely contraindicated. Finally, a direct hair colourant containing small-sized coloured dyes not requiring the use of an oxidative agent was tested at the request of the patient. The open test and prick test gave negative results at 20 min and 72 hr. The hair dyeing, performed in a hospital setting, was well tolerated: this direct colouring was allowed at home.

Discussion

Although allergic contact dermatitis caused by hair dyes is frequent, severe IHS reactions to hair dyes are exceptional, as only 8 cases have been reported in the English literature since 1987 (2–9). We report on the first case of hair dyes allergy in which a DHS reaction to two dyes preceded an IHS reaction to a third one. The allergens previously implicated in IHS are formed during the oxidization of precursor colorants (PPD, TDA, 4-methylaminophenol, 4-aminophenol, and Basic Blue 99) (2–5, 7). The present case shows that 2,4-diaminophenoxyethanol-HCl, an oxidation colorant that has been long used in hair dyes, can also produce, during oxidization, haptens responsible for IHS. This case shows that IHS can occur after prolonged exposure to an allergen, and that a DHS reaction does not exclude the appearance of IHS to another allergen in the same product.

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References


