

CORRESPONDENCE

Anaphylaxis to hair dye: a case report

Allergic reactions to permanent oxidation synthetic hair dyes have been reported to occur in less than 1 in 100 000 applications and the rate of sensitivity seems to have declined in the recent years [1]. Contact dermatitis is the most frequent manifestation [2–6] but cases of systemic reactions [7–10] and anaphylaxis [11–15] have been reported.

We were referred recently a 66-year-old woman who reported possible anaphylaxis after dying her hair. The clinical picture had a number of complicating features which we feel deserve wider publicity. The patient had used the same hair dye without problems for approximately 10 years. She was then prescribed diclofenac for joint pains and took the first dose a few hours before an appointment with the hairdresser. Her dye was applied as usual but a few minutes after the application of the dye she became giddy and flushed. She felt generally ill and her eyesight became blurred, but there was no rash or difficulty in breathing. She went outside for some fresh air and then returned to have her hair finished off. She was then admitted a few days later to hospital with an episode of pneumonia from which she made a good recovery. On returning home about 3 weeks after the first hair dye reaction, she started taking diclofenac and had her hair done again. This time, on applying the dye she became breathless with some chest pain, her speech became slurred and she had two bouts of diarrhoea. She called out her GP, who found low blood pressure and admitted her to hospital. She made an uncomplicated recovery and was able to go home within 9 h.

She was then referred to our department for investigation. A clear diagnosis could not be made because, although the history certainly sounded like anaphylaxis, it was unclear whether if the diclofenac might have been fully or partly responsible. As the patient was keen to determine the safety of her favorite dye, we agreed to undertake a challenge test. She attended the department and to start with, a small area of the scalp was dyed: there were no effects over the first 20 min. We therefore proceeded to dye the rest of the hair. After 20 min she reported palpitations and chest tightness. She then became faint and flushed. We washed off the dye and laid her down. Her pulse and BP were stable at this stage and there was no wheeze. Shortly afterwards her diastolic pressure began to drop and she began to develop a generalized urticarial rash. We gave subcutaneous adrenaline, intravenous fluids, hydrocortisone and chlorpheniramine. Over the next hour her BP remained low and the urticarial rash progressed, leaving no doubt this was indeed an

anaphylactic reaction to the hair dye. The patient went on to make a full recovery and was able to leave hospital within 3 h. She had no further episodes of anaphylaxis, angioedema or urticaria in the subsequent 3 months.

Synthetic organic hair colorants are of three types: temporary, semi-permanent and permanent oxidation dyes. In the permanent oxidation colorants, the oxidative dyes *para*-phenylenediamine, *para*-toluenediamine and related compounds are mixed with hydrogen peroxide to form benzoquinone imines which deposit in the cortex of the hair shafts. The imines react rapidly with 'couplers' or unoxidised *para*-dyes to yield the desired shade. The couplers most frequently used are 2,4-diaminoanisole, resorcinol, *m*-aminophenol and 1-naphthol.

Previous reports [11–15] have suggested that the oxidation products of *para*-phenylenediamine or diaminotoluene can be responsible for anaphylactic symptoms after hair colouring. Although the data sheet in the package recommends patch tests with the chemicals before use, in most of the reported cases of hair dye anaphylaxis, patch tests to the colouring and developing solutions showed no response [11,13,15]. In our case, we saw no reaction to the initial test exposure further illustrating the difficulty of screening for such reactions.

Our case demonstrates that patients can develop anaphylaxis to synthetic hair dyes even after long-term safe use. Testing for reactions to individual components is impractical and often unreliable. Formal challenge under properly controlled conditions may be required where doubt exists after obtaining a careful history.

References

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