Commentary

Dermatitis in Hairdressers as a Problem in Chemical Control

MARIE-LOUISE LIND*


Received 20 May 2005; in final form 31 May 2005; published online 4 August 2005

Much occupational disease in Europe is skin related and is mostly eczemas, usually on the hands (Dickel et al., 2001). In Britain, there are ~31,000 cases of skin diseases that are reported by the sufferers to be work-related (HSE, 2005). Occupational dermatitis is a well-known problem among hairdressers, as either irritant contact dermatitis or allergic contact dermatitis, or often a combination of both. Hairdressers are exposed to extensive wet work that can cause irritant contact dermatitis, and they have daily skin contact with innumerable cosmetic products containing compounds that are known to cause contact allergy. In Britain, hairdressers and barbers are in the top three occupational groups in terms of prevalence of dermatitis (HSE, 2004), and have been selected as a priority area for intervention within HSE’s Skin Disease Project, which in turn forms part of the Disease Reduction Programme.

In this issue, we report the levels of pertinent aromatic amines and resorcinol on hairdressers’ hands in Sweden (Lind et al., 2005). Amongst other chemicals, we found potentially sensitizing levels of p-phenylenediamine (PPD) on their hands during hair dyeing. As PPD was formerly banned in Sweden, and now permission is supposed to be obtained for its use, it provides an interesting example of the problems of chemical control.

In Sweden there has long been a trend in occupational welfare work where many opinion leaders have considered that the chemical problems—if not already solved—are easily dealt with. You simply remove the hazardous chemical and the problems will disappear. Of course, this is not always true, and hair dyes are a good example: in Sweden, efforts to remove a potentially hazardous chemical from the market have failed.

Today, the constituents of hair dyes most known to cause sensitization are the aromatic amines (PPD), and toluene-2,5-diamine (TDA) or its sulphate, toluene-2,5-diaminesulphate (TDS). These are used in permanent, ‘oxidative’, hair dyes, which are the most common type in the world market (Corbett, 1991). Permanent hair dyes have been in use since the late nineteenth century (Wall, 1957). Several clinical studies show that hairdressers run a high risk of developing occupational allergic contact dermatitis. PPD and TDA (or TDS) are often the most common agents responsible for allergic reactions, 17–58% of patch-tested hairdressers showing positive reactions to PPD and 14–25% to TDA or TDS in different studies (Armstrong et al., 1999; Iorizzo et al., 2002; Nettis et al., 2003; Uter et al., 2003). Apart from the local effect, systemic diseases can also follow exposure to the ingredients in permanent hair dyes. Studies of hair dye exposure indicate an increased risk of bladder carcinoma, both among hairdressers and women who use permanent hair dyes (Gago-Dominguez et al., 2001).

Owing to the risk of sensitization, the use of PPD in hair dyes was prohibited in Sweden between 1943 and 1992, and TDA between 1943 and 1964. From 1964 to 1992 TDA was used in permanent hair dyes instead of PPD (Wahlberg et al., 2002). With Sweden’s entry to the European Union in 1992, the national prohibition on the use of PPD was lifted, to bring Swedish law into line with the EU. Under the EEC Cosmetic Directive, PPD is allowed in hair dye products with a concentration limit of 6%; the TDA limit is 10%.

*Tel: +46-8-619-6995; fax: +46-8-619-6896; e-mail: marie-louise.lind@niwl.se

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In 1999, the former Swedish National Board of Occupational Safety and Health, now renamed Swedish Work Environment Authority, added PPD to the list of chemicals not allowed to be handled without permission. This was in order to control the professional use of PPD.

However, no hairdressers in Sweden today seek permission to handle PPD, even though the products used in hairdressing salons contain PPD. One can speculate on the reasons for this: one probably is that hairdressers do not always know what their products contain. This is a problem on its own. Hair cosmetics fall under the EEC Cosmetics Directive. This is under the jurisdiction of the Medical Products Agency, and according to the Directive (since January 1999) all cosmetic products handled in Sweden must bear a declaration of contents with the INCI (International Nomenclature of Cosmetic Ingredient) names of the compounds. In spite of this, some products that are used in hairdresser salons still lack a declaration of contents.

In 2002, a Swedish survey sought to elicit whether the reintroduction of PPD in hair dyes had caused an increase in the number of cases of contact allergy (Wahlberg et al., 2002). This study showed no increase or trend compared with the figures from the 1980s. A questionnaire investigation carried out by the Medical Product Agency among 30 registered suppliers of hair dyes showed that of the 73 products on the Swedish market in 1999, 30% contained PPD and 74% TDA. In our study presented in this issue (Lind et al., 2005), 10 of the 54 hair dyes contained PPD and only half of these 10 had a declaration of contents. The hairdressers themselves had imported these products. There is reason to believe that at least some PPD-containing hair-dye products were used during the prohibition, especially because no inventory or analysis of hair dye products was conducted during this period. This makes it difficult to know whether the number of PPD-exposed persons has increased since 1992.

One problem with clinical investigations is that they are not representative of the whole population. In Sweden, there has been no survey of the total number of PPD-positive hairdressers or hair dye consumers. In Denmark, 55 cases of severe, acute allergic contact dermatitis were identified after advertising for persons with adverse reactions to hair dyes. The authors of that study concluded that the presence of PPD and its derivatives in hair dyes at the allowed concentrations present a significant health risk to the population (Søsted et al., 2002).

One condition for the removal of dangerous chemicals is that a substitute exists. PPD is known as a strong sensitizer, and for PPD at least, there appears to be an alternative: TDA. This chemical has very similar properties; in fact it is almost the same molecule, apart from a methyl group. Some people with PPD-contact allergy cross-react with TDA when patch-tested, which means that a person already sensitized to PPD can react to TDA as well. In the German patch-test study, a greater number of TDA positive hairdressers than PPD positive were found and the number of TDA positive hair dye consumers had increased during the period 1995–2002 (Uter et al., 2003). To substitute both PPD and TDA becomes more difficult. The manufacturers claim that today there is no demand for any alternative to the oxidative hair dyes.

Agreements between hair cosmetics manufacturers and the hairdressers’ guild can be an alternative to the legislation to stop the use of allergens. An example for this is the successful agreement, in Germany in 1995, to stop the use of glyceryl monothioglycolate in permanent-wave solutions (Dickel et al., 2002). However, the author believes that legal measures would have a greater impact, and that a ban on PPD and maybe even TDA in hair dyes would compel the industry to produce alternative hair-dyeing products.

Substitution is not, of course, the only way to prevent contact dermatitis in hairdressers. Gloves may be used to prevent exposure to wet work and allergens. In our study we observed that many hairdressers use their gloves incorrectly. Thus, disposable gloves were used more than once, and often the gloves were torn inside out and reused or worn until they were torn. Another way to reduce contact with hair dyes is to alter the work routines, for instance by cutting the hair before dyeing. It is also important to reduce background exposure and to use skin care products. Many investigations have shown that childhood eczema is an important risk factor/effect modifier for hand eczema. Early vocational guidance is important and can prevent an unsuitable choice of career.

In Sweden, hairdressers are a very heterogeneous group, there are ~20 000 people working as hairdressers, the majority are self-employed and thus are hard to reach with conventional welfare work, which makes preventive measures difficult to be carried out. In Britain, there are ~130 000 hairdressers and barbers, the majority believed to be working in salons of <10 employees. These results illustrate that many people who fall ill due to the exposure to chemicals are employed in small enterprises, and implementing effective controls in such workplaces is not easy.

REFERENCES