Allergic Contact Dermatitis Due to Temporary Henna Tattoo: Case Report

Geçici Kına Dövmesine Bağlı Allerjik Kontakt Dermatit

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ABSTRACT In recent years, temporary tattoos are becoming more popular worldwide, especially among teenagers, instead of permanent ones. For reducing the time taken for the skin take up stain, several substances have been added to henna. Paraphenylendiamine (PPD) is one of the substances that cause black tattoo. Several cases have been reported on sensitization to this substance in temporary tattoo in the literature. Here, we report a 9-year-old boy with allergic contact dermatitis following application of temporary "black henna" tattoo which patch test was positive for PPD and N-Isopropyl-N-phenyl-4-phenylenediamine (IPPD). The patients sensitized to PPD and community should be informed about potential consequences of temporary tattoos, because it is believed that temporary henna tattoos are an innocent alternative to permanent tattoos.

Key Words: Lawsone; dermatitis, allergic contact

ÖZET Son zamanlarda, geçici dövmeler özellikle gençler arasında, kalıcı dövmelere göre dünya çapında daha popüler olmaktadır. Boyanın deri tarafından emilme süresini kısaltmak için kınaya çeşitli maddeler eklenmektedir. Parafenilendiamin (PPD) siyah dövmeye neden olan maddelerden biridir. Literatürde geçici dövme içinde bulunan PPD duyarlılığıyla ilgili birkaç olgu bildirilmiştir. Burada, 9 yaşında erkek çocukta, geçici dövme uygulaması sonrası gelişen, PPD ve izopropil-N-fenil-4-fenilendiamin (IPPD)'e karşı pozitif yama testi olan bir allerjik kontakt dermatit olgusu sunuyoruz. PPD'ye duyarlı hastalar ve toplum geçici dövmelerin potansiyel sonuçları hakkında bilgilendirilmelidir, çünkü geçici kına dövmelerinin, kalıcı dövmelere göre masum bir alternatif olduğuna inanılmaktadır.

Anahtar Kelimeler: Lawsone; dermatit, allerjik kontakt

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Henna is a natural hair dye and a temporary tattoo has become popular worldwide.[1] Henna plant (*Lawsonia inermis* or *Lawsonia alba*) is commercially available as a dark green powder of dried leaves that can be reconstituted into a paste with water. Henna is a traditional paint used during marriage ceremonies and other celebrations, the tincture has also been used as an antimycotic and tuberculostatic agent.[2] For reducing the time taken for the skin take up stain, several substances have been added to henna. P-phenylendiamine (PPD) is one of the substances that cause "black tattoo".[3] The addition of this sensitizing substance to henna increases the risk of allergic contact dermatitis to henna tattoo mixtures. A number of cases have been reported on the issue.[4]

We present a boy with allergic contact dermatitis due to temporary black henna tattoo which patch test was positive for both PPD and IPPD.

CASE REPORT

A 9-year-old boy has applied a temporary black henna tattoo to his right arm and after 1 week, it has been wiped up, therefore he repeated the same process during vacation. In the following 2 days after second application, an erythema and a papulovesicular eruption developed on the application site (Figure 1). He was treated with topical methylprednisolone aceponate 0.1% cream twice daily and an oral antihistamine for 1 week. The lesions cleared with a slight postinflammatory hyperpigmentation.

After resolution of the lesions, the patient was patch tested with the European standard series and natural henna. The results of the patch test were observed after 48 and 72 hours and revealed a (+++) to PPD, (+) to IPPD, and negative reaction to natural henna (Figure 2).

DISCUSSION

Henna is a plant dye derived from the shrub Lawsonia, which grows primarily in North America and Middle East. Black henna tattoos have become increasingly popular among young people in recent years as in the Middle East, South-East Asia, and Africa. Henna is also a traditional body painting in Turkey.[5]

Brancaccio and colleagues[4] have analyzed one black henna tattoo mixture and found that it contained more than 15% PPD by weight, which is a considerably higher amount than allowed in hair dyes, as recommended by European Union. In skin painting, not only the use of PPD and derivatives are prohibited, but the concentrations are also much higher than allowed.

PPD is an antioxidant amine and used mainly as a permanent dye for hair and fur and in the manufacturing of black rubber. In addition, PPD cross reacts with a number of structurally-related compounds that like IPPD, have an amino group in the

FIGURE 1: A pirate image located on the right upper arm.

FIGURE 2: Positive patch test reaction to PPD (22) and IPPD (12) in 48h.

para position of their benzene ring. IPPD, is also an antioxidant amine used in rubber manufacture, has allergenic properties similar to PPD.[6] The long duration of skin contact, the high concentrations of sensitizing materials, and the lack of a neutralizing agent dramatically increase the risk of allergic contact sensitization with potential long-term consequences.[4]

Although henna is used as a traditional body painting and hair dye in the Turkish community, childhood allergic cases to black henna are uncommon. In the literature, only 9 cases have been reported from Turkey.[2,5,7] Five of these cases were childhood allergic reactions to black henna tattoo. The others were allergic reactions to henna as a hair dye. None of these cases has positive reaction to IPPD.

In this case, the second application of henna tattoo and onset of dermatitis suggest that sensitization occurred during first application. The positive patch test to PPD suggests that PPD is the relevant antigen in this case as most of other reported cases in the literature. However, in our case, there is also positivity to IPPD as a cross reaction to PPD. This cross reactivity raised by a natural compound (black henna) may cause allergic contact dermatitis in occupations such as hair dressers, tyre manufacturers, car-mechanics, drivers, and various industrial branches. Schultz and Mahler reported a lichenoid reaction in an 8-year-old boy which IPPD was positive as cross reaction to PPD.[8]

It is important for physicians to be aware of the possibility of allergic contact dermatitis from temporary black henna tattoo. Physicians should also educate their patients and community about the risks of permanent hair dyes as a consequence of allergic reactions to PPD and IPPD, because it is believed that henna tattoos are an innocent alternative to permanent tattoos.

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