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CASE REPORT

Temporary Henna Tattooing: a Case of Contact Dermatitis

Peyton E. Goodie[1] and Craig G. Burkhart[2,*]

[1]*University of Toledo College of Medicine, Toledo, Ohio, USA*

[2]*University of Toledo College of Medicine, Toledo, Ohio, Ohio University College of Osteopathic Medicine, Athens, Ohio, USA*

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Abstract: A case of a temporary henna tattoo is presented in which red henna containing p-phenylenediamine (PPD) caused a severe adverse reaction. The eruption began three days after its application and patient experienced itching and mild pain at the tattoo site along with an erythematous, papular lesion. The topic is discussed with pictures of this eruption.

Keywords: Dermatitis, Henna tattooing, *Lawsonia inermis*, P-phenylenediamine (PPD).

INTRODUCTION

Temporary henna tattoos have increased in popularity worldwide in the recent years, especially among teenagers. These temporary tattoos are trendy, painless, inexpensive, easy to apply, simple to remove, and come with no risk of HIV or hepatitis infections [1]. While pure henna is relatively safe, red henna can be combined with p-phenylenediamine (PPD) to create black henna. There are numerous reports in the literature of black henna tattoos leading to adverse reactions. Here we report on a case of allergic contact dermatitis after application of a temporary black henna tattoo.

CASE REPORT

While vacationing in Mexico, a fourteen-year-old boy had a temporary henna tattoo applied to his arm Fig. (**1**). An adverse reaction to the tattoo began three days later Fig. (**2**). He experienced itching and mild pain at the tattoo site along with an erythematous, papular lesion. Although it would have been ideal to patch test patient, the mother refused given cost and additional visits, given the high probability the cause was already ascertained. He was treated with topical steroids with good resolution of the lesion in two weeks.

DISCUSSION

Henna is a powder obtained from the leaves of the *Lawsonia inermis* plant. When applied to the skin, the pigment lawsone interacts with keratin to give a reddish-brown appearance. Henna has been used for over 5000 years to dye skin, hair, fingernails, and fabrics. The use of henna as body art has cultural meaning in Islamic and Hindu cultures.

In more recent years, PPD has been added to henna to accelerate the drying process while increasing the intensity and longevity of the tattoo. According to 12-year Food and Drug Administration (FDA) data published in 2015, 70 cases of adverse reactions to temporary henna tattoos have been reported dating back to 1997 [2]. The majority of patients present with the classical picture of allergic contact dermatitis characterized by erythema, edema, papules, and vesicles limited to the site of the tattoo. However, more severe reactions have been reported including lichenoid contact dermatitis, generalized dermatitis, and urticarial reactions. Post-inflammatory hypopigmentation, hyperpigmentation,

* Address correspondence to this author at the University of Toledo College of Medicine, Toledo, Ohio, Ohio University College of Osteopathic Medicine, Athens, Ohio, USA; Tel: +1 419 885 3403; Fax: +419 885 3401; E-mail: cgbakb@aol.com

and hypertrichosis have also been reported. There are a handful of cases reporting systemic reactions to PPD. Symptoms may include dizziness, syncope, and gastrointestinal discomfort. The ingestion of PPD through PPD-containing hair dye has been linked to respiratory, muscular, and renal failure [3].

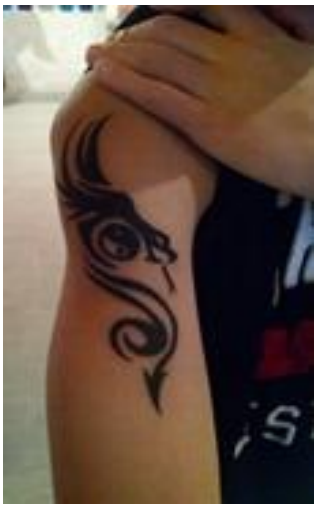

Fig. (1). The henna tattoo three hours after application.

Fig. (2). Allergic contact dermatitis that developed within days at site of henna tattoo on upper arm.

Not only can black henna elicit an acute reaction, but it also carries a risk of PPD sensitization. PPD is a known strong sensitizer of the skin [4]. Black henna contains alarming levels of PPD. These levels are unregulated and range from 15% to 30% [5]. It has been estimated that 2.5% of black henna tattoo users become sensitized to PPD [6]. A recent cross-sectional study of five European countries found the prevalence of PPD contact allergy in black henna tattoo users to be 3.2% compared to 0.6% in nonusers [7]. Once sensitized to PPD, cross-reactions to PPD-containing hair dyes, textiles, local anesthetics, and rubber chemicals may occur [6]. The cross-reactions to local anesthetics and rubber chemicals is not because they contain PPD, but because they contain chemically related substances such as benzocaine and isopropyl-phenyl-para-phenylenediamine (IPPD).

In 2006, the American Contact Dermatitis Society (ACDS) named PPD as "Allergen of the Year." The ACDS and American Academy of Dermatology (AAD) jointly advised a ban on the use of PPD-enhanced henna tattoos in 2008 [8]. There is regulation regarding the use of PPD in henna in Europe, Canada, and USA, but henna products that contain PPD are still in existence. These potentially harmful tattoos, as in our case, continue to remain largely unregulated at fairs, beaches, and resorts.

A limitation of this case report is that sensitization to PPD was not demonstrated with patch test, however clinical

signs and patient's history demonstrated an association between henna tattoo and symptoms.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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Declared none.

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