

## Contact Dermatitis due to Tattoo Ink in Two Young Togolese Women

Kombate K<sup>1</sup>, Teclessou JN<sup>1\*</sup>, Saka B<sup>1</sup>, Akakpo SA<sup>1</sup>, Mouhari-Toure A<sup>2</sup>, Mahamadou G<sup>2</sup>, Tchangbedji G<sup>3</sup> and Pitche P<sup>1</sup>

<sup>1</sup>Service de Dermatologie CHU de Lomé / Faculté des Sciences de la Santé Université de Lomé, Togo

<sup>2</sup>Service de Dermatologie CHU Kara/ Université de Kara, Togo

<sup>3</sup>Laboratoire Gestion Traitement Valorisation des Déchets/ Faculté des Sciences Université de Lomé, Togo

\*Corresponding author: J Teclessou, Service de dermatologie et IST, CHU Lomé, Togo, Tél: 00-228-90198130; E-mail: [tjulie06@yahoo.fr](mailto:tjulie06@yahoo.fr)

Received date: July, 20, 2016; Accepted date: August 13, 2016; Published date: August 18, 2016

Copyright: © 2016 Kombaté K, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

Pseudo tattoo is the application of pigmentogen substance on the skin according to pre-drawn shapes for aesthetic purposes. The most common ink used in skin tattoo is henna; however, other kind of inks is also used to carry out this type of tattoo. The use of tattoo inks could be the cause of various skin reactions. We report two cases of contact dermatitis following use of pseudo tattoo ink in two patients. These two patients are not members of the same family, but the same tattoo ink was used in both cases. The patch tests performed in both cases were positive for nickel sulphate 5%. Analysis of the sample of the ink noted the presence of a substantial amount of nickel. The outcome was favourable in both cases under treatment with a cream of betamethasone dipropionate.

**Keywords:** Contact dermatitis; Pseudo tattoo ink; Nickel sulfate; Lomé

### Introduction

Pseudo tattoo is the painting of the skin with a pigment in order to change its color for aesthetic purposes. Henna, as well as other types of inks is usually used to perform this kind of tattoo. These other types of inks are being increasingly used by women because providing a darker pigmentation than henna. These are pigments of different colors and different compositions whose use may exhibit allergic reactions [1,2]. Several types of skin reactions to tattoo inks have been described after permanent tattoos and/or temporary tattoos such as: contact dermatitis, granulomatous and lichénoïde reactions [2]. We report two cases of contact dermatitis after a pseudo tattoo ink in Togo.

### Case 1

A 22 years old woman, with no family or personal history of atopy or contact allergy to nickel consulted in dermatology unit for papules, pruritus and scabs on the back of the left hand and left forearm since 11 days (Figure 1).



Figure 1: Papules and scabs on the back of the hand.

These lesions were limited on tattooed area and appeared 72 hours after a pseudo tattoo with a black ink produced in China. The

diagnosis of contact eczema due to this tattoo ink was established and the patient was treated with betamethasone dipropionate ointment. The outcome was favourable after 14 days of treatment. A patch test using European standard battery containing phenylenediamine, performed 8 weeks after the treatment showed an intensive positive reaction to nickel sulfate 5% with erythema, edema and vesicles. The reaction was negative to phenylenediamine. The semi-open test performed on the ink used by the patient showed also a strong positive reaction.

### Case 2

A 12-years old female, with no history of nickel allergy, consulted in dermatology unit for vesicular and bullous lesions, pruritus of the hands and forearms since 4 days (Figure 2). These signs and symptoms occurred 72 hours after a pseudo tattoo with black ink made in China. The diagnosis of contact eczema due to this tattoo ink was established and the patient was treated with betamethasone dipropionate ointment. The patch test using the European standard battery containing phenylenediamine performed 10 weeks after the treatment showed a weak positive reaction to nickel sulphate 5% with erythema and edema. The test was negative to phenylenediamine. The semi-open test performed on the ink used by the patient was positive.

Although the two patients are not members of the same family, the same tattoo ink was used in both cases. The ink's chemical composition was not notified. The translation of label available on the package indicated that this ink is a product for nourishing the skin and hair. Chemical analysis of this ink performed in a laboratory of the University of Lomé, using atomic absorption spectrophotometry method showed that it contains 0.6204 mg/kg of nickel, 0.4539 mg/kg of cadmium and 0.2982 mg/kg of lead.

### Discussion

The diagnosis established in our two cases was contact dermatitis in the presence of cutaneous lesions limited to the tattooed area and the positivity of the patch test for nickel. Contact dermatitis cases due to

henna after pseudo tattoos have been described [3,4]. And the allergen identified in these cases was the phenylenediamine.



**Figure 2:** Vesicular and bullous lesions on the back of the hands and forearm.

In our cases, only the patch test to nickel sulphate 5% was positive, but the test for phenylenediamine was negative. The absence of history of nickel allergy in our patients, the positivity of patches tests for nickel and its negativity for phenylenediamine, as well as the presence of a significant amount of nickel in the ink used led to conclude to a nickel contact dermatitis. However, the weak positive reaction to nickel sulphate in the second case contrasting with the intensity of the reaction to the tattoo ink may suggest the presence of other type of allergens in the ink that have not been tested by the standard battery used for patch test. A case of contact dermatitis after a tattoo with black ink, with positive patch test to nickel sulfate 5% had already been reported by Gallo et al. [1].

The exact chemical composition of the inks used for tattoos is often difficult to identify, most manufacturers do not mention it on the

packaging. A spectrophotometric analysis of 14 different types of black tattoo inks showed the presence of dibutyl phthalate [5]. These black tattoo inks also contained iron oxide, carbon, and other natural compounds [2]. In our case, the spectrophotometric analysis of the black ink showed acceptable levels of lead and cadmium and a significant amount of nickel (0.62 mg/kg of ink). In Europe, there are regulations regarding all products containing nickel. Such products are prohibited, except those with nickel concentration less than 2 µg/cm/week. Also, nickel is banned as an ingredient in cosmetic products; and only its presence as trace or impurity is permitted.

## Conclusion

The inks used in the pseudo-tattoos can cause allergic skin reactions. Users of these inks should pay attention to the dubious origin products whose composition is not clearly mentioned.

## References

1. Gallo R, Parodi A, Cozzani E, Guarrera M (1998) Allergic reaction to India ink in a black tattoo. *Contact Derm* 38: 346-347.
2. Kaur RR, Kirby W, Maibach H (2009) Cutaneous allergic reactions to tattoo ink. *J Cosmet Dermatol* 8: 295-300.
3. Kluger N, Raison-Peyron N, Guillot B (2008) Temporary henna tattoos: Sometimes serious side effects. *Presse Med* 37:1138-1142.
4. Boui M, Sedrati O, Zouhair K, Bentaleb R, Benchikhi H (2008) Le tatouage au henné: d'une teinture naturel aux eczéma de contact. *Ann Dermatol* 135: 895-897.
5. Lehner K, Santarelli F, Vasold R, König B, Landthaler M, et al. (2011) Black tattoo inks are a source of problematic substances such as dibutyl phthalate. *Contact Derm* 65: 231-238.