Occupational contact allergy caused by benzidine in three tannery workers

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Contact Dermatitis 2012; 66(6):340–355
**Key words**: benzidine; contact dermatitis; allergic contact dermatitis; tannery workers

In the context of an on-going study at two leather tanneries in Indonesia we patch tested all of 184 workers with the European baseline series, shoe series and a number of additional allergens including benzidine (1% pet). The selection of additional allergens was based on an inventory of the chemicals used at these factories. Patch tests were read on days 2, 4 and 7 as recommended by the ICDRG. A positive reaction to benzidine was observed in 3 workers.

**Case 1:**

A 38-year-old female tannery worker had occupational contact dermatitis on her wrists, forearms and palms. She had worked for 19 months at the finishing department of the tannery and was involved in measuring and packing the leather after a protective and decorative coating had been applied. No signs of atopic constitution were found. Patch testing showed positive reactions to myroxylon pereirae (+), fragrance mix I (+), fragrance mix II (+) and benzidine (+). The inventory of the chemicals at this tannery showed that they still used a benzidine-based dye. No other allergens were present at her work station.

**Case 2:**

A 46-year-old female tannery worker had occupation related dermatitis on her hands, wrists and forearms. The dermatitis appeared after she started to work at the tannery. Her dermatitis worsened after she had been exposed to chemicals at the tannery and to detergents when she washed her hands. She had worked at this tannery for almost 5 years. She had no other part-time job besides her main work. Her main duty was preparing chemicals for the tanning process. She always wore synthetic rubber gloves when working with the chemicals. She had a history of atopic dermatitis. Patch testing showed positive reactions to hydroquinone monobenzylether (+), primin (+) and benzidine (+). Based on our observational study at this tannery there was no exposure to hydroquinone monobenzylether and primin and we could not find any benzidine-based dyes.
Case 3:

A 41-year-old male tannery worker had a history of tannery work-related dermatitis on his hands, wrists and forearms. The dermatitis appeared when he had started to work at the tannery. It worsened when he was exposed to chemicals at his workplace and healed when he had a few days leave. He had worked at this tannery for 18 years. He had no other part-time job besides his main work at the tannery. He had a history of atopic dermatitis. On skin examination, there were no prominent skin lesions and we only noted that he had a dry skin. Patch testing showed positive reactions to N, N-diphenylguanidine (+) and benzidine (+). Based on the observational study at this tannery, there was no exposure to N, N-diphenylguanidine, benzidine or any benzidine-based dyes.

Discussion

Benzidine and its derivatives have been used to manufacture dyes during many years in the past. Sensitization to benzidine as one of the standard allergens was reported three decades ago in 5% of 4,600 patients patch tested in a 5-year period between 1973-1977 in Spain. In 1978, several countries banned the manufacture of dyes from benzidine because of its potential carcinogenic effect therefore there are no recent reports on benzidine sensitization.

Although substitutes of benzidine-based dye were plentiful, continued demands from the textile and the leather industries for the original dyes made from benzidine and its related compounds have persisted in newly developing industrial countries.

In case 1, there was a relevant current exposure to benzidine based dye during her work in the finishing process. In case 2 and 3 we found sensitization to benzidine without any current relevant exposure to benzidine in the workplace. The possibility of past exposure to benzidine based-dyes in these 2 workers can not be excluded. In conclusion, this report shows the possible exposure to benzidine-based dying in tanneries in newly developing countries.
References

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