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ALLERGIC CONTACT DERMATITIS WITH A FERTILIZER CONTAINING HYDROGEN CYANAMIDE (DORMEX[®])

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Cyanamide is a chemical substance used in the treatment of chronic alcoholism as well in agriculture as a fertilizer. We report the case of a 28-year-old healthy non-atopic man that developed a severe skin eruption after the accidental penetration of a small amount of Dormex[®] (a plant growth regulator containing cyanamide) through the patient's gloves. Patch tests revealed positive reactions to Dormex[®] 1% pet. and cyanamide at a dilution of 0.1% pet. and 1% pet. We discuss the causes of sensitization in a patient that regularly used protective measures during anti-parasites treatments.

Keywords: Contact dermatitis; Dormex[®]; Hydrogen cyanamide

INTRODUCTION

Cyanamide is a chemical substance used in the treatment of chronic alcoholism as well in agriculture as a fertilizer. This substance is highly toxic and adverse health effects have been reported for both applications (1–5). We report a case of allergic contact dermatitis (ACD) with cyanamide contained in a plant growth regulator (Dormex[®]).

CASE REPORT

A 28-year-old healthy non-atopic man was referred to our department because of the appearance of severe vesicular and bullous lesions together with intense

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itching on the left hand, right wrist, chin, and right ear. These lesions appeared in concomitance with the use of Dormex (Degussa AG, Trostberg, Germany), a plant growth regulator containing cyanamide as the active ingredient (49% by weight), used to increase bud break and flowering of vines. The patient had used the same product in the spring of the previous three years, without any adverse effect. During the anti-parasite treatments, the patient had used all suitable protective measures. Nevertheless, the skin eruption appeared after a small amount of Dormex penetrated the patient's gloves. This substance contaminated the patient's hands and later his face by self-contamination. The skin reaction disappeared promptly after the application of an antiseptic solution and a topical corticosteroid (mometasone furoate). After dermatitis healing the patient was patch tested with the SIDAPA (Italian Society of Allergological, Professional and Environmental Dermatology) standard series, with Dormex 1% pet and with cyanamide at a dilution of 0.1% pet and 1% pet (F.I.R.M.A., Florence, Italy). Patch tests were performed using Al-chambersTM (Euromedical, Calolziocorte, LC, Italy), and readings were made after 2 and 4 days (D). Patch tests gave positive results (++) at D2 and D4 to Dormex 1% pet and to cyanamide at both concentrations.

DISCUSSION

Cyanamide is used in the form of calcium cyanamide and as hydrogen cyanamide. Calcium cyanamide was introduced in Canada, Europe, and Japan in 1965 as a pharmacological substance for the treatment of chronic alcoholism because it lowers the ethanol concentration in the blood and inhibits acetaldehyde dehydrogenase. In literature cases of exfoliative dermatitis in patients treated with cyanamide for their chronic alcoholism have been described (1). Moreover, cases of hands and face eczema in hospital workers who handled cyanamide during treatment of alcoholic patients have been reported (2–5). Other cases of professional eczema with cyanamide were described in a fitter and turner after the use of lead cyanamide (6), in a chemist (7), and in a supervisor of the synthesis of phosphorylcreatine who showed allergic reactions to cyanamide and dibenzyl phosphite, both used as reagents in phosphorylcreatine synthesis (8). In all the aforementioned cases, positive reactions to cyanamide, patch tested at dilutions from 0.001% pet to 5% pet inclusive, were observed.

Moreover, hydrogen cyanamide is extensively used as a fertilizer because soil bacteria can transform it into ammonium carbonate, a source of nitrogen available to plant life. Adverse skin reactions due to cyanamide (Dormex) as a fertilizer have been described in grapevine workers (9). These include erythema multiforme (EM) and Stevens-Johnson syndrome/toxic epidermal necrolysis; in 5 patients, the seriousness of the skin reactions required management in Intensive Care Units. In this study no allergological test using the active constituent of Dormex was carried out so it is not possible to establish whether the reactions were allergic or toxic. Nevertheless, they could have been allergic because they appeared after frequent contact with the fertilizer used without any protective measures. In Italy 25 cases of skin eruptions in patients exposed to Dormex during its application as a fertilizer have been described (10). Most of these patients failed to wear complete protective equipment

during application of the fertilizer. From the published data it is not possible to establish the features and nature (allergic or toxic) of the skin reactions involved.

We report a case of ACD from Dormex. The clinical appearance of the skin lesions and the constant use of protective measures by the patient, suggest that the skin reactions were toxic. Allergological tests clarified the true nature of the dermatitis. Probably the patient had been sensitized after previous contact with objects contaminated by the fertilizer and/or with treated plants. The protective measures are used exclusively during the mixing and sprinkling of Dormex, but not during manipulation of objects and plants contaminated by the fertilizer. Our case suggests that patients exposed to Dormex must meticulously observe all the suitable protective measures and adopt precautions when manipulating objects contaminated by the fertilizer and treated plants. In addition, it is important to perform allergological tests in patients with skin reactions to identify their true nature (allergic or toxic).

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