

Occupational allergic contact dermatitis caused by (*R*)-3-(2-chloro-1-hydroxyethyl)-phenol

Richard Brans, Christoph Skudlik and Swen Malte John

Department of Dermatology, Environmental Medicine and Health Theory, University of Osnabrueck, 49090 Osnabrueck, Germany

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(*R*)-3-(2-chloro-1-hydroxyethyl)-phenol (HCPE) is a precursor in the production of the sympathomimetic drug phenylephrine (Fig. 1). Here, we report a case of occupational allergic contact dermatitis caused by HCPE in a chemical worker.

Case Report

A 42-year-old chemical worker presented to our department with a 4-year history of work-related eczema on the hands and lower arms. The lesions had occurred while the patient was working for a pharmaceutical company in the production of pseudoephedrine. Apart from pseudoephedrine derivatives, the patient was exposed to other irritant chemicals. Once a year, HCPE had been purified in the same facility and then turned into phenylephrine. During this time of the year, the patient had twice experienced substantial worsening of the skin lesions.

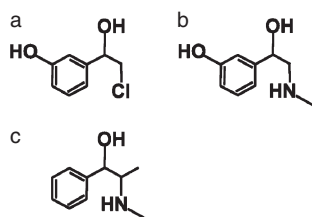


Fig. 1. Chemical formula of (*R*)-3-(2-chloro-1-hydroxyethyl)-phenol (a), phenylephrine (b), and pseudoephedrine (c).

Patch testing was performed on the patient's back with the German baseline series and standardized series of preservatives, topical preparations, and rubber components. In addition, pseudoephedrine hydrochloride, pseudoephedrine sulfate, phenylephrine hydrochloride and HCPE were tested (1%, 5% and 10% pet.). The patches were removed after 24 hr, and readings were performed daily on D1–D4 according to the International Contact Dermatitis Research Group guidelines. The patient developed positive reactions only to HCPE (1%, 5% and 10% pet., + on D2–D4). We diagnosed irritant contact dermatitis resulting from wet work and exposure to irritants, as well as occupationally acquired hypersensitivity to HCPE and related allergic contact dermatitis of the hands and lower arms.

Discussion

HCPE is used as a precursor in the production of phenylephrine. To the best of our knowledge, no reports have been published on cases of allergic contact dermatitis caused by HCPE.

Phenylephrine is a selective α_1 -adrenergic receptor agonist that is usually applied topically as a decongestant in nasal sprays, eye drops, and ear drops, and as an agent to dilate the pupils of the eyes. Moreover, it is used as a vasoconstrictor in anaesthetic ointments and orally as an ingredient in cough and cold medicines (1–6). Recently, phenylephrine has been marketed as a substitute for the sympathomimetic drug pseudoephedrine. Pseudoephedrine is a precursor of methamphetamine, and its sale is therefore restricted in many countries, such as the United States.

In general, phenylephrine rarely causes allergic contact dermatitis (1–6). However, phenylephrine hydrochloride has been considered to be an important ophthalmic allergen (7, 8).

Correspondence: Richard Brans, Department of Dermatology, Environmental Medicine and Health Theory, University of Osnabrueck, Sedanstraße 115, 49090 Osnabrueck, Germany. Tel: +49 541 4051810; Fax: +49 541 969 2445. E-mail: rbrans@uos.de

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Cross-reactions between phenylephrine and pseudoephedrine have been described (9, 10). However, in the present case, no cross-reactivity between HCPE and phenylephrine or the also chemically related

pseudoephedrine were detected (Fig. 1). This may be attributable to steric differences between the substances or the test preparations.

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