

Short Communication

Allergic contact dermatitis from δ -aminolevulinic acid used for photodynamic therapy

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Photodynamic laser therapy, using topical δ -aminolevulinic acid (δ -ALA), is a method of treating superficial cancers and precancers (1–5). In this form, the chemical is usually well tolerated (2), which has also been shown in animals (6).

Case Report

A 54-year-old woman was treated by photodynamic laser therapy for Bowen's disease of the vulva. For photosensitization, a preparation containing 2 g of δ -ALA, 8 ml of propylene glycol, 0.2 g of silicic acid, and 2 ml of sodium bicarbonate 8.4% aq. solution was used. This semiliquid gel was applied to the lesion for 6 h to allow penetration into the tissue and conversion to protoporphyrin IX. Thereafter, the area was exposed to 100 J/cm² from a dye laser (Coherent GmbH, Dieburg, Germany) at a wavelength of 635 nm. The immediate phototoxic erythema was covered with a sterile, dry, nonadherent dressing.

By the following day, an intensely itchy, papuloerythematous dermatitis had developed in the genital region, spreading to the groins, abdomen, buttocks, and medial thighs. The skin lesions cleared after several days of topical corticosteroids. The patient's previous allergological history was remarkable only for occasional eczema on the face, forearms and hands, which seemed to be related to occupational exposure to cosmetics, because she worked in a perfumery as a saleswoman.

Patch tests were performed 10 weeks after clearing of the acute dermatitis. Using Finn Chambers[®] on Scanpor[®], the following compounds were tested: a standard series (German Contact Dermatitis Research Group), a series of common vehicles and preservatives of topical preparations, the original gel containing δ -ALA, and the individual constituents of the latter. Reading of the test reactions was carried out after 2 and 3 days (D). Exposure of the test area to light was avoided till the end of the test procedure. The patient

showed positive patch test reactions to colophony, fragrance mix, the photosensitizing gel as a whole, and to a 20% aqueous solution of δ -ALA (Table 1). Control tests with this preparation of δ -ALA elicited no skin reaction in 10 persons.

Comment

The clinical presentation and test results of this patient strongly indicate that allergic contact dermatitis due to δ -ALA developed as an adverse effect of photodynamic laser therapy. To our knowledge, this has not been reported before. It remains open whether δ -ALA itself or compounds derived from it during the synthesis of protoporphyrin IX are the actual allergen.

The interval between administration of the gel containing δ -ALA and the occurrence of the eruption was only 1 day. Evidently, the patient had acquired specific sensitization earlier as a result of contact with δ -ALA, δ -ALA derivatives or other compounds of similar chemical structure. Unfortunately, we were not able to obtain any clues to the source of this in the medical history of the patient.

Table 1. Results of patch tests

	D2	D3
colophony 20% pet.	–	+
fragrance mix 8% pet.	–	++
remainder standard series	–	–
vehicles and preservatives		
all substances	–	–
photosensitizing δ -ALA preparation	–	+
δ -ALA 20% aq.	?+	++*
silicic acid (syn. hydrated silica) as is	IR	IR
sodium bicarbonate 8.4% aq.	–	–

* No reaction in 10 controls.

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