

para-Phenylenediamine Allergic Contact Dermatitis in Twins

To the Editor:

para-Phenylenediamine (PPDA) contact allergy is common (0.1–1% of the general population¹ and 2–5% among patch-tested patients²). Contact dermatitis may appear in twins although there are few reports on the detection of sensitization to the same allergens.^{3,4} A report of contact sensitization to nickel occurring in twins suggested that specific contact allergy sensitization may be related to some genetic determinants as well as environmental factors.⁴ Nevertheless, human leukocyte antigens (HLAs) do not clearly correlate with contact allergies.⁵ We report a case of allergic contact dermatitis to PPDA in twin sisters.

A 22-year-old female patient complained of acute dermatitis after using a permanent hair dye. Twenty-four hours after using the hair dye, she developed pruritus, erythema, edema, and suppurative lesions on the scalp and ears. The symptoms disappeared with systemic antihistamines and corticosteroids. She had previously used hair dyes, without problems. Four years before, her twin sister was studied in our department because of similar symptoms after the use of a hair dye as well as rhinitis related to house dust exposure.

Patch testing was carried out with a European Standard battery according to the International Contact Dermatitis Research Group recommendations. Allergens were applied on clinically normal skin on the back in 8 mm Finn Chambers (Epitest Ltd Oy, Tuusula, Finland). The patches were left on the skin for 48 hours, and readings were performed at 48 and 72 hours.⁶ Skin-prick tests with common aeroallergens were carried out, following standard procedures.⁷

Both twins showed positive patch-test reactions to nickel sulfate, cobalt chloride, PPDA, and caine mixture.

Skin-prick tests were positive for *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, *Cynodon dactylon*, and *Lolium perenne* in both women. The twin who was

suffering from rhinitis also showed positive skin tests with *Olea europaea*.

Total immunoglobulin E (IgE) was 125 kU/L and 98.9 kU/L for each twin, respectively. Specific IgE was 38.6 kU/L and 6.71 kU/L for *Dermatophagoides pteronyssinus*, 24.8 kU/L and 4.84 kU/L for *Dermatophagoides farinae*, 0.35 kU/L and 0.35 kU/L for *Cynodon dactylon*, 0.38 kU/L and 1.34 kU/L for *Lolium perenne*, and 0.35 kU/L and 1.22 kU/L for *Olea europaea*.

The genetic determinants evaluated in both twins by the lymphocytotoxicity technique were identical for HLA-A, HLA-B, HLA-DR, and HLA-DQ haplotypes A2, B44, BW4, DR1, DR4, DR53, DQ5, and DQ3. The HLA class II haplotypes (by high-resolution molecular biology [polymerase chain reaction]) of both twins were DP1, DP6, DPB1*0101, and DPB1*0601.

We report the cases of two genetically identical twin sisters who developed allergic contact dermatitis to PPDA after using hair dyes.

The two reported cases may simply show coincidental contact allergy, but it is possible that the patients have an inherited tendency to develop type IV allergic reactions. Other authors have reported HLA-Dw3 haplotype in persons sensitive to N-isopropyl-N'-phenyl-p-phenylenediamine.⁸ Nevertheless, this haplotype was not present in our patients. Moreover, both twin sisters showed almost identical sensitizations to inhaled allergens although at present only one of them has developed symptoms of allergic rhinitis.

M.C. Torres Gorriz

T. Linares

D. Hernández Fernández de Rojas

Allergy Department

University Hospital La Fe

Valencia, Spain

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From the Allergy Department, University Hospital La Fe, Valencia, Spain.

Address reprint requests to Maria Cruz Torres Gorriz, Servicio de Alergia, Hospital Universitario La Fe, Av. Campanar, 21, 46009 Valencia, Spain. E-mail: mtorres_gorriz@hotmail.com.

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Procedure Pearl: Patch Testing, a Light in the Dark

To the Editor:

Patch-test application, be it comprehensive testing or the Thin-Layer Rapid Use Epicutaneous test (T.R.U.E. Test [Mekos Laboratories A/S, Hillerød, Denmark]), allows for specific identification of chemical allergen sensitizers. The commercially available T.R.U.E. Test strips are notched to line up with the reversible test read decoder strip (Fig 1). When it comes to comprehensive patch testing, however, the average number of allergens placed on a patient ranges from 65 to 100, and there are no notches or decoder strips.

If detecting a relevant allergen is like looking for a needle in a haystack, then improper marking of the location of the patches correlates with looking for the needle in the haystack in the dark. Most patients do not want their entire backs inked up with surgical markers. Thankfully, there is a “light-in-the-dark” technique, a Wood’s light (long-wave ultraviolet light), that is.

Patch-test strips are placed on the patient’s back, and corresponding numbers are placed at the corners to ease location during evaluation (Fig 2). After the test strips are removed, a fluorescent marker is used to outline each

From the Department of Dermatology and Cutaneous Surgery, University of Miami Miller School of Medicine, Miami, FL.

Address reprint requests to Sharon E. Jacob, MD, Assistant Professor of Clinical Dermatology, Department of Dermatology and Cutaneous Surgery, Director of Contact Dermatitis Clinic, University of Miami Miller School of Medicine, 1295 N.W. 14th Street, Miami, FL 33125. E-mail: SJacob@med.miami.edu

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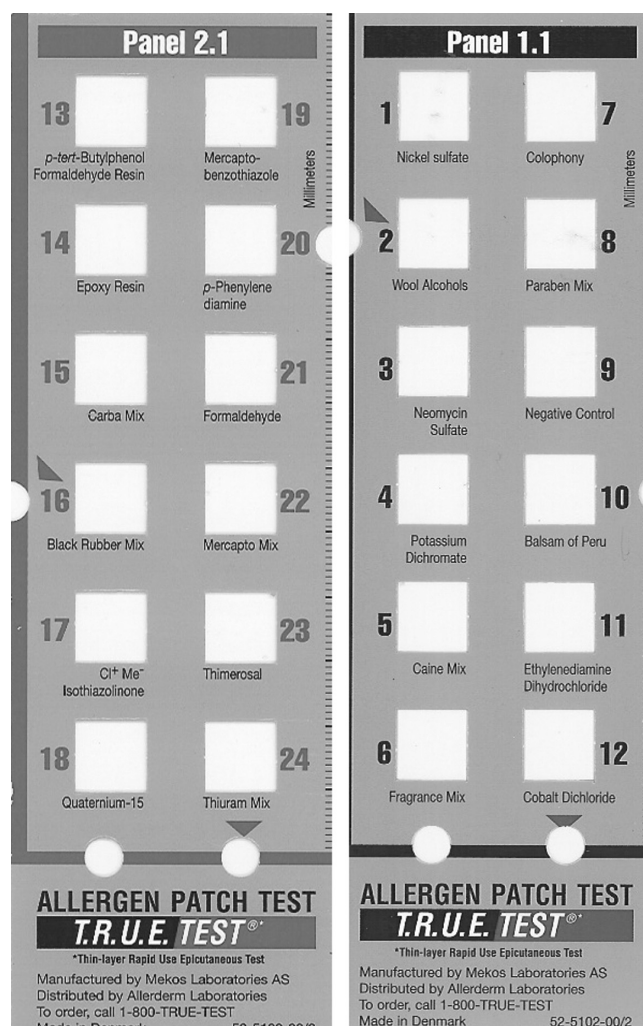


Figure 1. T.R.U.E. Test (Allergen TM) notch and decoder strip.