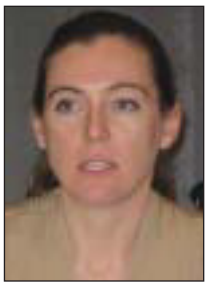
Patch Testing Reveals Top Allergens in Children

Using the same allergen concentrations for testing children as used in adults found safe and effective.

BY BRUCE JANCIN

MAUI, HAWAII — The first two multicenter studies of patch testing conducted in American children have established that the same ubiquitous allergens responsible for most allergic contact dermatitis in U.S. adults are similarly prevalent and clinically relevant in the pediatric population.



The two studies demonstrated that comprehensive patch testing in children using the same allergen concentrations as in adults is both safe and efficacious, Dr. Sharon E. Jacob said at the annual Hawaii dermatology seminar sponsored by Skin Disease Education Foundation.

One study was conducted by the North American Contact Dermatitis Group (NACDG).

The study involved 391 children—including 144 younger than 13 years old—and 9,670 adults with recalcitrant dermatitis who were patch tested using all or part of the 65-antigen NACDG screening series. Fifty-one percent of the children and 54% of adults proved to have at least one positive patch test deemed clinically relevant, meaning that the offending allergen caused the patient's symptoms (Arch. Dermatol. 2008;144:1329-36).

'Children with clinically relevant patch test results show significant improvement with allergen avoidance.'

DR. JACOB

Dr. Jacob was the lead investigator in the other study, in which 65 children (aged 1-18 years) with recalcitrant dermatitis were patch tested. Of the children, 50 (77%) had one or more positive patch tests considered clinically relevant (Pediatr. Dermatol. 2008;25:520-7).

Both studies were retrospective and involved referral populations.

Until these two studies were published last year, American physicians were reliant upon European and Asian data regarding patch testing and allergic contact dermatitis (ACD) in children.

As it turns out, however, many of the top causes of pediatric ACD internationally proved to be the same allergens that came to the fore in the two U.S. studies, noted Dr. Jacob, a pediatric dermatologist at the University of California, San Diego.

For example, nickel was the No. 1 cause of pediatric ACD internationally. It was also the top cause in Dr. Jacob's study, where it accounted for 18% of cases, and in the NACDG study, in which 26% of children were found to have ACD due to nickel.

Thimerosal was No. 4 internationally, No. 2 in Dr. Jacob's study, and No. 3 in the NACDG study. Balsam of Peru (*Myroxylon pereirae*) was No. 5 abroad, No. 3 in Dr. Jacob's study, and No. 7 in the NACDG series.

All told, 8 of the top 10 allergens causing ACD in the international pediatric study were in the top 15 in Dr. Jacob's study, and 7 of the international top 10 were concordant among U.S. adults and children in the NACDG study.

Dr. Jacob has synthesized the key findings of the two U.S. studies to compile a list of the top pediatric ACD allergens in the United States. (See below.)

She urged her colleagues to consider patch testing all children with recalcitrant dermatitis that clears only with superpotent topical or oral corticosteroids. Dermatitis on the hands or eyelids is particularly suggestive of ACD. The testing often yields a big clinical payoff.

"Children with clinically relevant patch test results show significant improvement with allergen avoidance," she said.

Yet patch testing of children is vastly underutilized in the United States, Dr. Jacob continued, in part because there is no patch test that is FDA approved for use in patients younger than 18 years. Also, there is a widespread myth that

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ACD is rare in children, supposedly because their immune systems are naive and they have fewer chemical exposures. However, studies demonstrate ACD accounts for about 20% of all childhood dermatitis.

The paucity of pediatric patch testing in the United States was highlighted in a postmarketing survey by Allerderm, which makes the TRUE (Thin-layer Rapid Use Epicutaneous) test.

In a series of 3,200 TRUE test reports during a recent 2-year period, only 93 (3%) were for patients under 19 years of age.

Dr. Jacob disclosed that she is on the speakers bureaus for Astellas Pharma, Inc. and Coria Laboratories, and has received research grants from Allerderm.

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Found in Zippers and Chocolate, Top Contact Allergen in Children Named

The top allergens causing ACD in children are as follows:

► **Nickel and cobalt.** These two allergens are listed jointly because they're mined together in iron ore and often cosensitize. Nickel, named the American Contact Dermatitis Society's "Allergen of the Year" for 2008, will be the target of a planned major U.S. initiative to reduce environmental nickel release.

The effort is now being organized along the lines of the successful European directive, which has sharply reduced cases of ACD. Nickel is found in many metal objects, including jeans snaps, zippers, paper clips, coins, keys, jewelry, and orthodontic braces. Chocolate is the top food source.

► **Neomycin.** The No. 2 contact allergen in U.S. adults for the last 30 years, this antibiotic is also a cause of ACD in kids.

► **Balsam of Peru and fragrance mix.** This combination contact allergen is widely utilized to impart flavors in food products as well as for scent.

► **Formaldehyde and quaternium-15.** A common preservative, formaldehydeis a major cause of systemic allergic reactions. It is released by quaternium-15.

► **Potassium dichromate.** Cement, leather, and watch straps are the sources most often implicated in pediatric ACD.

► **Colophony.** This allergen often is present in adhesives, cosmetics, and paper.

► **Lanolin.** This alcohol extraction of sheep sebum is used as an emulsifier and emollient. It is found in cosmetics, creams, leather, and other products.

► **Carbamates.** Commonly causing ACD, carbamates are used as accelerators in rubber.

► **Para-phenylenediamine.** Watch out for this in temporary tattoos.

► **Sorbitan sesquioleate.** An emulsifier increasingly used to enhance penetration of topical medications, including corticosteroids. It's also present in many diaper balms.

► **Disperse dyes.** These are found in clothing and diapers.

Source: Dr. Jacob