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Painless Tape Strips Used to Detect Molecular Changes in Skin of Children with Eczema

Findings may help predict a child's response to eczema medicine and development of associated conditions like asthma and ADHD

In a study using non-invasive tape strips in young children with eczema (or atopic dermatitis), researchers found many molecular signs of immune dysfunction and skin changes that relate to disease activity. These signs (or biomarkers) were present even before eczema was visible and can be used to track disease activity over time. With more research, these biomarkers also may help predict response to medicine and development of conditions associated with eczema, such as asthma, other allergies, infections and even attention deficit hyperactivity disorder (ADHD). Findings were published in *JAMA Dermatology*.

"Our study was the most comprehensive to date to demonstrate that tape strips can be used in infants and young children instead of painful biopsies to assess early-onset atopic dermatitis on the molecular level," says senior author Amy Paller, MD, from Ann & Robert H. Lurie Children's Hospital of Chicago, who also is Chair of Dermatology and Professor of Pediatrics at Northwestern University Feinberg School of Medicine. "We found the highest number of atopic dermatitis biomarkers, including new ones, that might be predictors of treatment response, disease progression, and development of comorbid conditions."

Atopic dermatitis is a long-lasting, inflammatory, extremely itchy skin disorder that affects 10-20 percent of children in the United States. Currently, molecular profiling of skin biopsies is the gold standard for evaluating atopic dermatitis.

"In young children, skin biopsies are virtually impossible to perform, even in research, since they are painful and leave scars," says Dr. Paller. "This reinforced our desire to find a way to evaluate these kids that did not hurt at all."

The study included 51 children younger than 5 years, with 21 children who had moderate to severe atopic dermatitis that had its onset less than six months previously. Tape strips were collected from the skin with and without lesions in the children who had atopic dermatitis, as well as from the normal skin of children who did not have the condition. Researchers evaluated gene expression of 77 biomarkers of immune dysfunction and skin barrier changes (97% of biomarkers assessed) in children with atopic dermatitis.

"Our findings pave the way for more routine use of tape strips in pediatric longitudinal research and clinical trials for atopic dermatitis," says Dr. Paller. "Eventually, we hope this technology will become commercially available for use in the clinic."

Research at Ann & Robert H. Lurie Children's Hospital of Chicago is conducted through the Stanley Manne Children's Research Institute. The Manne Research Institute is focused on improving child health, transforming pediatric medicine and ensuring healthier futures through the relentless pursuit of knowledge. Lurie Children's is ranked as one of the nation's top children's hospitals by *U.S. News & World Report.* It is the pediatric training ground for Northwestern University Feinberg School of Medicine. Last year, the hospital served more than 220,000 children from 48 states and 49 countries.