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A more accurate tool to predict asthma in young children

A team of scientists at Cincinnati Children's Hospital Medical Center in Cincinnati, OH, US have developed and tested a decision tool they believe to be the most accurate, non-invasive method to date for prediction of asthma in young children. The Pediatric Asthma Risk Score (PARS) is available online and smartphone apps are in development. Parents can use the tool with a child as young as 2 or 3 years of age to help determine whether a doctor should evaluate the child for asthma. The study was published in the *Journal of Allergy and Clinical Immunology*.

In a news release, senior author Gurjit Khurana Hershey, MD, PhD, Director of Asthma Research at Cincinnati Children's and lead author and researcher Jocelyn Biagini Myers, PhD, explained that for more than 20 years, the Asthma Predictive Index (API) has been the "gold standard" to which others tests have been compared. While useful for predicting which children will not develop asthma, it "leaves much room for improvement in terms of identifying children who will," said Myers. "Children with mild to moderate risk may be the most likely asthma patients to respond favorably to prevention strategies," noted Khurana Hershey.

Development of the PARS tool

The PARS tool was developed using data from the Cincinnati Childhood Allergy and Air Pollu-

tion Study—a group of 762 infants born between 2001 and 2003 in Cincinnati and northern Kentucky who were children of parents who had at least one allergy symptom. The children were examined annually at the ages of 1, 2, 3, 4 and 7 for the development of allergic disease. They underwent skin testing for 15 airborne and food allergens including cat, dog, cockroach, dust mites, trees, mold, weeds, grass, cow's milk and hen's egg. At 7 years of age, 589 of the children were evaluated for asthma development using objective measures of lung function; 16% had asthma. In addition, the researchers questioned parents about numerous factors that contribute to asthma risk.

The children who had asthma at age 7 were more likely to have at least one parent with asthma, two or more positive skin tests to airborne or food allergens, eczema at a young age, wheezing apart from colds, frequent wheezing at a young age, a diagnosis of allergic rhinitis in the first three years of life, and to be African-American.

Comparisons of PARS results

While the API and PARS tests equally predicted asthma risk for children with the greatest number of risk factors, the researchers found the API test missed 43% of asthmatic children identified by the PARS test to be at mild or moderate risk. The PARS tool was found to be 11% more sensitive than the API. "Our PARS model either outperforms and/or is less

invasive than 30 existing models intended to predict asthma development," said Khurana Hershey. "The PARS also may be more clinically useful and applicable in an office setting," she added.

Implementation of PARS

The PARS tool has new and less invasive criteria than previous tools. Additions include demographic data and clinical factors routinely collected during an asthma or allergy assessment in a doctor's office. To facilitate easy implementation of PARS in clinical and research settings, the study contains a scoring sheet that includes the decision tool and clinical interpretations. A web application that provides fast and easy calculation can be found at <https://pars.research.cchmc.org>. Smartphone apps are being developed for the iPhone and android phones. In addition, the United States National Institutes of Health will include the test in their ongoing nationwide study of Environmental Influences on Child Health Outcomes Program (<https://www.nih.gov/research-training/environmental-influences-child-health-outcomes-echo-program>).

References

Content for this article was based on and excerpted from:

- Jocelyn M. Biagini Myers, Eric Schauburger, Hua He, Lisa J. Martin, John Kroner, Gregory

M. Hill, Patrick H. Ryan, Grace K. LeMasters, David I. Bernstein, James E. Lockey, S. Hasan Arshad, Ramesh Kurukulaaratchy, Gurjit K. Khurana Hershey. A Pediatric Asthma Risk Score to better predict asthma development in young children. *Journal of Allergy and Clinical Immunology*, 2018; DOI: 10.1016/j.jaci.2018.09.037.

- Scientists create most accurate tool yet developed to predict asthma in young children, Cincinnati Children's Hospital Medical Center, December 13, 2018.
- Scientists create most accurate tool yet developed to predict asthma in young children, *Science Daily*, December 13, 2018.
- Parents and kids needed a better asthma test; thanks to Cincinnati Children's, it's here, *Cincinnati Enquirer*, Cincinnati.com, December 13, 2018.