INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Novel Blood Test to Predict Safe Foods for Infants and Toddlers with Food Protein-Induced Enterocolitis Syndrome (FPIES)

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Diagnostics
Life Sciences

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OVERVIEW

A novel test to determine whether a child is suffering from food protein-induced enterocolitis syndrome (FPIES)

- A sampling of white blood cells are incubated with food samples to detect an immune response
- Permits the detection of FPIES without invasive testing or side effect risks

BACKGROUND

Food Protein-Induced Enterocolitis Syndrome (FPIES) is an immune condition characterized by reactivity to one or more foods and which manifests early in life. The most common symptoms of FPIES include severe vomiting and diarrhea due to inflammation in the small intestine and colon. Foods that may trigger symptoms are milk, soy, and grains, although these causative exposures are variable and some children with severe cases can only tolerate one or two types of food. FPIES usually presents during infancy as solid foods are introduced into a child's diet, though most children outgrow the condition by the three to five years of age. Though the condition resolves with maturation, the associated malnutrition, failure to thrive, and psychological food aversions may have long lasting effects on afflicted children. FPIES differs from food allergies in that it does not produce food IgE antibodies and therefore cannot be diagnosed using currently available food allergy tests. This circumstance is therefore difficult to identify and is considered a diagnosis of exclusion once other potential causes of the symptoms are eliminated. Food sensitivities are isolated by first eliminating a particular food and then reintroducing it as a "challenge" to evaluate reactions in the absence or presence of the suspect food. Oral food challenges unfortunately may trigger severe symptoms, and the invasive tests

used to rule out other diagnoses include risks. So, a need exists for a less problematic diagnostic tool to confirm the presence of FPIES.

INNOVATION

Researchers at the University of Michigan have designed a novel test to determine whether a child had FPIES and to predict which foods will be tolerable to an affected patient. This approach involves taking a blood sample following white blood cells are incubated with different food samples for three hours, given that the reaction associated with FPIES is commonly delayed for two to six hours after trigger food ingestion. A gene expression is then measured by quantitative reverse transcriptase polymerase chain reaction (RT-PCR) to evaluate which foods cause an immune response in the patient. Any one of a number of biomarkers can be measured to indicate the presence of non-IgE-mediated food intolerance. The test serves as the equivalent of an oral food challenge while removing the child from the risk of adverse reactions. While the prevalence of FPIES is thought to be small, its true scope may be better delineated through the use of this type of test. The potential exists for this diagnostic test to also be utilized for other non-IgE-mediated food hypersensitivity syndromes such as food protein-induced allergic proctocolitis, food protein-induced enteropathy, or celiac disease.