



SHORT REPORT

# Rice protein-induced enterocolitis syndrome

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## KEYWORDS

Food protein-induced enterocolitis syndrome;  
Rice;  
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## Summary

**Background & aims:** Food protein-induced enterocolitis syndrome (FPIES) is a non-IgE-mediated allergic reaction, usually to cow's milk or soy protein. The aim is to present a series of infants with enterocolitis syndrome developed after rice ingestion. To our knowledge, the issue has only once been described in patients from Europe.

**Methods:** Data on five patients were retrospectively analyzed. The patients presented with vomiting, diarrhea and dehydration; therefore, allergy was not considered as a diagnosis and the patients underwent broad diagnostic evaluation. Finally, an open food challenge was performed for suspicion of rice allergy.

**Results:** Detailed clinical and laboratory findings are presented. As all patients had symptoms which could have been indicative of a broad spectrum of diseases, a median of two hospitalizations was needed to establish the diagnosis. When the rice protein-induced enterocolitis syndrome is suspected all patients should undergo open food challenge test, as no other diagnostic procedure can confirm the diagnosis.

**Conclusion:** This report shows that even hypoallergenic foods such as rice may cause FPIES and should be considered in the differential diagnosis of profuse vomiting and prostration in infants introduced to some kind of rice protein.

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## Introduction

In general, food allergy is a spectrum of disorders that result from an aberrant immune response to

dietary antigens, which can be either IgE-mediated or non-IgE-mediated. In IgE-mediated food allergy, T-cell-directed antigen-specific IgE production leads to sensitization, and re-exposure to the same antigen results in the release of mediators causing allergic reaction. The second, non-IgE-mediated mechanism results from direct T cell antigen response, mediated by proinflammatory cytokines

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and leading to a variety of chronic responses.<sup>1</sup> One of these non-IgE-mediated reactions, very infrequently described, is food protein-induced enterocolitis syndrome (FPIES).<sup>2</sup> Clinical presentation of FPIES is characterized by profuse vomiting and prostration that lead to dehydration and sometimes shock. Symptoms commonly begin 2–4 h after ingestion of the incriminated protein and, therefore, represent an allergic reaction with delayed onset. The diagnosis is based on clinical criteria and oral challenge. Although mostly caused by cow's milk or soy protein, some authors have described similar reaction to solid food protein.<sup>2–4</sup>

The aim of this report is to present a series of infants with enterocolitis syndrome developed after ingestion of rice protein, which has, to our knowledge, only once described in patients from Europe.<sup>5</sup>

## Material and methods

We reviewed medical records of five patients referred to the Referral Center of Pediatric Gastroenterology and Nutrition, Zagreb Children's Hospital, for treatment of severe dehydration and prostration due to the then unknown cause (differential diagnosis included seizures, sepsis, meta-

bolic disease, etc.). Upon admission and treatment of life-threatening symptoms, all patients underwent broad diagnostic evaluation to exclude different infectious, neurological and metabolic diseases. Eosinophil count, total IgE, RAST to food protein, Hemocult testing and skin prick tests were obtained for suspicion of allergy. Finally, rice protein was incriminated and all five patients underwent an open food challenge. For open food challenge all patients received rice cereals mixed with water. At the beginning a very small amount of food (only few drops) was given and every half an hour an amount of food was increased. The patients remained under close observation for 8–10 h. Expecting a severe positive reaction, the test was performed after obtaining an informed consent and with all due precautions (venous access, emergency equipment, and constant surveillance).

## Results

Detailed clinical and laboratory findings are presented in Table 1. Patients were 5–6 months old, and it was their first to third hospitalization. By the time of admission, all patients were breastfed, in one a cow's milk formula was also introduced, and all had tried different fruits. It is important to

**Table 1** Clinical presentation of patients with rice induced FPIES.

Patient	Age at diagnosis (months)	History of family atopy	Onset of the symptoms (hours after ingestion)	Symptoms	Breast feeding	No. of hospitalization
1	5	No	2	Vomiting, diarrhea, dehydration, acidosis, lethargy	Yes (2 months), Cow milk formula introduced	2
2	6	No	1	Vomiting, diarrhea, acidosis, cyanosis, dehydration	Yes (2 months), Cow milk formula introduced	2
3	6	No	3	Vomiting, diarrhea, lethargy, dehydration	Yes	1
4	6	No	1	Vomiting, diarrhea, dehydration	Yes	2
5	6	No	2	Vomiting, diarrhea, dehydration, lethargy	Yes	3

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