

Sesame: An unrecognized trigger of food protein-induced enterocolitis syndrome

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Clinical Implications

- Acute food protein-induced enterocolitis syndrome (FPIES) can occur with severe symptoms of repetitive protracted vomiting, lethargy, and diarrhea that may result in severe dehydration and shock and need for immediate medical intervention. Even so, the awareness regarding this entity is low, and it is often misdiagnosed. Sesame allergy often presents as IgE-mediated reactions, yet it is important to acknowledge that it can also present as acute FPIES.

TO THE EDITOR:

Food protein-induced enterocolitis syndrome (FPIES) is a non-IgE-mediated food hypersensitivity reaction that manifests mainly with gastrointestinal symptoms. Two distinct phenotypes of FPIES are recognized: - acute and chronic.¹ Acute FPIES is characterized by profuse repetitive vomiting accompanied by pallor and lethargy occurring 1 to 4 hours after food ingestion.^{2,3} Chronic FPIES occurs in infants when the offending food is ingested as part of the diet on a regular basis presenting as intermittent emesis, chronic diarrhea, poor weight gain, or failure to thrive.⁴

The diagnosis of FPIES is based on clinical parameters with suggested diagnostic criteria that include acute onset of vomiting 1 to 4 hours after ingestion of the culprit food, lethargy, marked pallor, and the need for intravenous fluid support.⁴ Reproducibility of the reactions with repeated exposure to the suspect food is also supportive of the diagnosis. An IgE-mediated allergic reaction should be excluded. An oral food challenge is considered the gold standard to confirm the diagnosis in cases with unclear diagnosis.⁴

Sesame seeds are recognized as an important allergen causing IgE-mediated food allergy.⁵⁻⁷ The prevalence of sesame seed allergy varies in different geographical regions, ranging from 0.1% to 0.2% in North America, 0.18% in Israel, and 0.8% in Australia.⁵ The rate of sesame seed-induced anaphylaxis also varies significantly by region with 2.8% of food-induced anaphylaxis cases in Canada compared with 43% in Israel.^{5,7} Sesame is traditionally consumed as a paste called tahini or as a sesame-based confection called halva. In addition, it is also used as a topping on bread and crackers. Skin prick test (SPT) and serum-specific IgE are key components in the diagnosis of IgE-mediated food allergy. However, the reported diagnostic predictive values of SPT with sesame seed extract are inconsistent among different reports. In some reports, a prick-to-prick test with crushed sesame seeds, oil, or fresh tahini seems to be more

sensitive compared with the commercial sesame seed extract and serum-specific IgE.⁵

Here we report the first 5 cases of FPIES induced by sesame seed. The patients were evaluated at the allergy departments of 3 different medical centers in Israel within the last 2 years. Clinical data are summarized in [Table 1](#).

Patient 1 is an 8-month-old healthy baby girl who was fed tahini (sesame paste) for the first time. One hour after ingestion she developed acute repetitive vomiting (>4), became lethargic, and 6 to 7 hours later passed 2 to 3 loose stools. Both the vomiting and lethargy resolved within 4 hours after it started. SPTs to various foods including sesame seed extract and fresh tahini paste were negative. In addition, serum-specific IgE to sesame seed was negative, <0.35 kU/L (Immulite 2000; Siemens, Erlangen, Germany). Two months later the parents fed her a small amount of tahini at home without waiting for the scheduled food challenge in clinic, and once again she developed profuse repeated vomiting (>4) mandating treatment with intravenous fluids. At 14 months of age, the patient was challenged to sesame in the allergy clinic and tolerated it well without incident.

Patient 2 is a 6-month-old healthy baby boy who developed acute recurrent vomiting (>4) and appeared pale and “exhausted” 2 hours after the first introduction of tahini to his diet. He recovered at home within a few hours without treatment. A second attempt to give sesame at home resulted in a similar reaction. He was then referred to the allergy clinic for assessment. SPT and serum-specific IgE antibodies to sesame were negative. An oral food challenge with tahini at 1 year of age was successful.

Patient 3 presented at 6 months of age with profuse repetitive vomiting (>4) and lethargy 2 hours after the ingestion of tahini. On evaluation, she had a negative SPT to sesame seed extract. At 1 year of age, a food challenge with tahini was attempted in the allergy clinic and resulted in repeated vomiting, pallor, and lethargy. She required intravenous treatment with ondansetron and fluids. Currently, she avoids sesame in her diet, and a repeated food challenge is scheduled at 18 to 24 months of age.

Patient 4 presented at 6 months of age with acute repeated vomiting (>4) and pallor 2 hours after ingestion of food containing sesame seeds and almonds. SPTs to sesame and almond extracts were negative. A food challenge to sesame at 1 year of age resulted in acute repetitive vomiting, pallor, and lethargy. She was treated with intravenous ondansetron and fluids with resolution of her symptoms. She currently avoids sesame in her diet, and a food challenge is scheduled at the age of 18 to 24 months.

Patient 5 presented at 8 months of age with 2 episodes of acute repetitive vomiting (>4), lethargy, and pallor starting an hour after ingestion of fruits puree mixed with tahini. SPTs with both sesame seed extract and fresh tahini were negative. She currently avoids sesame in her diet, and a sesame food challenge is scheduled at 18 to 24 months of age.

FPIES occurs most often early in life; usually, milk- and soy-induced FPIES present before 6 months of life, whereas FPIES caused by other solid foods occurs later (6-12 months).⁴ In the majority of acute FPIES cases (75%), the clinical presentation

TABLE I. Clinical characteristics of patients with sesame food-induced enterocolitis syndrome

Patient	Age at first reaction (mo)	Age at diagnosis (mo)	Sex	Symptoms	Time to onset (h)	SPT	Specific IgE	Age of tolerance (mo)
1	6	8	F	Repeated vomiting (>4), ill appearing, diarrhea	1	Neg	Neg	14
2	6	8	M	Repeated vomiting (>4), pallor, lethargy	2	Neg	Neg	12
3	6	8	F	Repeated vomiting (>4), lethargy	2	Neg	ND	Not tolerating*
4	6	8	F	Repeated vomiting (>4), lethargy	2	Neg	ND	Not tolerating*
5	8	11	F	Repeated vomiting (>4), lethargy	1	Neg	ND	Unknown

ND, Not done; Neg, negative; SPT, skin prick test.

*Oral challenge failed at 1 year of age.

occurs after the first or second ingestion of the triggering food.² The most common reported triggers of FPIES are cow's milk, soy, and various grains such as rice, oat, barley, and wheat. However, a wide range of foods are associated with this syndrome, including white and sweet potatoes, eggs, chicken, vegetables, fruits, shellfish, fish, nuts, and peanuts.^{3,4}

In all 5 cases, the symptoms started after the first introduction to tahini between the age of 6 and 8 months. This reflects the practice of early introduction of food containing sesame seed such as tahini and halva to the diet in Israel. It is a common practice among family health centers, nurses, and dietitians to recommend adding tahini or halva to the diet of children in the first year of life as a good source of calories and bioavailable iron.

Age of resolution of acute FPIES differs by the food implicated, as well as population-specific characteristics, particularly, the atopic status.³ Usually, grains and solid food-induced FPIES resolve later than those caused by cow's milk and soy.² Cow's milk-mediated FPIES was reported to resolve in 94% of cases by the age of 3 years in different cohorts, whereas FPIES induced by other solid foods such as rice was reported to resolve in only 65% of cases by the age of 3 years.^{2,4} In 2 of our 5 patients, the allergy resolved at 1 year of age, whereas in 2 other patients, the food challenge at 1 year of age failed and resulted in typical FPIES symptoms.

Although FPIES is not an IgE-mediated allergy, atopy has been reported to occur more often in some of the studies and has been associated with an older age of FPIES resolution.⁴ Atopic dermatitis is the most common atopic disorder at diagnosis, presenting in up to 50% of the cases.¹ In our report, a history of atopic dermatitis or IgE-mediated food allergy was negative in all our 5 patients. Of note, none of our patients with FPIES had positive SPT to sesame.

In conclusion, acute FPIES to sesame has not been previously reported. It may well have been overlooked and interpreted as a viral illness or food poisoning, and as such, affected children are at risk for repeated severe reactions. Therefore, we believe that primary care physicians, pediatricians, and allergists should be familiar with this unique entity.

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