

M. DON¹, G. LONGO²

Food protein-induced enterocolitis syndrome due to banana: an uncommon entity

¹Pediatric Care Unit, "Sant'Antonio" General Hospital, San Daniele del Friuli, Udine, Italy - E-mail: max.don@libero.it

²Institute for Maternal and Child Health, IRCCS "Burlo Garofolo", Trieste, Italy

KEY WORDS

Food protein-induced enterocolitis syndrome; food allergy; plant food allergy; banana allergy

SUMMARY

Food protein-induced enterocolitis syndrome is a non-IgE-mediated food allergy that typically occurs within the first year of age and it is often misdiagnosed for its rarity. This syndrome is usually caused by milk or soy in formula-fed infants, but it can also be associated to solid food proteins, fruit proteins included. We describe and discuss the first case of an infant with mild acute/late form of FPIES due to banana only.

Corresponding author

Massimiliano Don, M.D., Ph.D.

Pediatric Care Unit

"Sant'Antonio" General Hospital

Viale Trento Trieste, 33

33038 San Daniele del Friuli - Udine, Italy

Phone: +39 0432 949271

Fax: +39 0432 949272

E-mail: max.don@libero.it

Introduction

Food protein-induced enterocolitis syndrome (FPIES) is a non-IgE-mediated food allergy that typically occurs within the ninth month of life. There are two clinically distinct forms: the chronic/early form characterized mainly by failure to thrive and diarrhea and the acute/late form characterized by repetitive emesis, diarrhea, lethargy, pallor and, in the worse cases, shock and hypotension after ingestion of a food protein. In this latter form children show symptoms 2 to 6 hours after eating a trigger food. This syndrome is usually caused by the ingestion of cow's milk or soy, but it can also be associated to solid food proteins. Skin and blood tests for specific IgE are negative and the diagnosis is clinical. [1-5] Among solid foods proteins, to best of our knowledge there is only one case-report that highlights that fruit proteins may be responsible of FPIES. [6] We describe and discuss the

first case of an infant with mild acute/late form of FPIES due to banana only.

Case report

The infant in object was born after full-term physiological gestation, exclusively breastfed for six months and started complementary feeding with apple, pear and banana at 5 months and half of age. Family history was positive for house-dust-mite rhinitis and grass-pollen asthma in the maternal line. At 6 months of age, she experienced repeated episodes of vomit 2 hours later the oral assumption of apple with banana. Few days later, at least 2 hours after the oral assumption of banana only, the infant experienced repetitive vomiting again, accompanied by paleness and lethargy lasted 8 hours. The same clinical picture was repeated at 8 months

of age, two hours later the oral assumption of a yogurt with pear and 10% banana extract. Since then the infant has not eaten banana anymore and her parents did not notice anything strange in their daughter after ingestions of other foods/fruits. At 19 months of age, we visited the girl for the onset of paleness and repeated vomits 4 hours later the assumption of 100 mL of juice with pineapple and banana (19% of the latter). The girl was well-looking, weak but aware, pale, without any active skin rash; vital parameters were normal as well as heart, lung and abdomen findings at the physical examination. Nearly 7 hours later the assumption of such fruit-juice, the laboratory work-up showed 12560/ μ L white blood cells, 8350 neutrophils/ μ L, 66.5% neutrophils and 368000 platelets/ μ L. One hour later the blood sample was taken all symptoms subsided, so the girl was discharged with the diagnosis of solid food FPIES and the suggestion to keep banana off her diet.

One month after this third FPIES episode, in a fully well-being period, white blood cells, neutrophils and platelets, measured by routine methods, were 5460, 870 (16%) and 331000 cells/ μ L, respectively. Skin prick test (Lofarma, Milan, Italy) resulted negative for fruit-mix (nut, hazelnut, chestnut, date, fig), exotic-fruit-mix (banana, pineapple, kiwi, mango, papaya, grapefruit) and banana itself (tested by prick-by-prick). Total and specific IgE serum levels for inhalant and food allergens (banana, pineapple, kiwi, pear, avocado, in particular), measured by fluoro-enzyme-immunoassay (Phadia, Milan, Italy), were 2.5 and <0.15 kUI/L, respectively.

Discussion

In 1986 Powell [6] suggested specific diagnostic criteria, updated by Sicherer et al. in 1998, [7] for the diagnosis of FPIES, based on the result of the oral food challenge (OFC). On the contrary, present literature considers that the diagnosis of FPIES may remain clinical only without performing OFC, at least in cases characterized by a typical clinical picture. [2,5,8] The OFC should be reserved for doubtful cases, when the clinical picture is mild and not well expressed or when the offending food is difficult to be identified. [2] We considered that the present clinical course, defined by three late-onset distinct and consecutive episodes of repetitive vomiting, paleness and sleepiness after ingestion of banana was sufficiently exhaustive for the diagnosis of FPIES associated to this fruit. Moreover, the demonstration of leukocytosis with elevated neutrophil count at the third episode and the absence of specific IgEs for banana were

other two evidences that induced to not consider OFC mandatory for the final diagnosis.

To best of our knowledge, a case of banana-induced FPIES has not been previously reported. In the clinical observation by Bruni et al. [9] the criteria for the diagnosis of fruit-induced FPIES were for the first time satisfied by a positive mixed-fruit OFC (with apple, pear and banana mixed together; 11961 neutrophils/ μ L or 67.2% neutrophils post-OFC). FPIES episodes were always characterized by repetitive vomiting, hypotonia and lethargy. After one year completely free from allergic symptoms, the patient accidentally drank peach-juice developing the previously reported clinical picture consistent with fruit-induced FPIES. In their retrospective monocentric series of 35 patients that experienced 66 episodes of FPIES over a 16-year period, [3] Mehr et al. found that 29 patients reacted to 1 food and 6 reacted to 2 foods. Causative foods for the 35 children were rice, soy, cow's milk, vegetables and fruits, meats, oats, and fish. Only one not better described patient experienced FPIES after the ingestion of 2 separate foods (rice and banana).

We think the present report gives a contribution on the knowledge of FPIES, showing that also proteins contained in banana may be responsible for this particular form of non-IgE-mediated food allergy.

References

1. Sicherer SH. Food protein-induced enterocolitis syndrome: case presentations and management lessons. *J Allergy Clin Immunol* 2005;115:149-56
2. Nowak-Wegrzyn A, Muraro A. Food-protein-induced enterocolitis syndrome. *Curr Opin Allergy Clin Immunol* 2009;9:371-377
3. Mehr S, Kakakios A, Frith K, Kemp AS. Food protein-induced enterocolitis syndrome: 16-year experience. *Pediatrics*. 2009;123:e459-64
4. Nowak-Wegrzyn A, Sampson HA, Wood RA, Sicherer SH. Food protein-induced enterocolitis syndrome caused by solid food proteins. *Pediatrics* 2003;111:829-835
5. Leonard SA, Nowak-Wegrzyn A. Food protein-induced enterocolitis syndrome: an update on natural history and review of management. *Ann Allergy Asthma Immunol* 2011;107:95-101
6. Powell GK. Food protein-induced enterocolitis of infancy: differential diagnosis and management. *Compr Ther* 1986;12:28-37
7. Sicherer SH, Eigenmann PA, Sampson HA. Clinical features of food protein-induced enterocolitis syndrome. *J Pediatr* 1998;133:214-9
8. Miceli Sopo S, Giorgio V, Dello Iacono I, Novembre E, Mori F, Onesimo R. A multicentre retrospective study of 66 Italian children with Food Protein-Induced Enterocolitis Syndrome: different management for different phenotypes. *Clin Exp Allergy* doi:10.1111/j.1365-2222.2012.04027.x
9. Bruni F, Peroni DG, Piacentini GL, De Luca G, Boner AL. Fruit proteins: another cause of food protein-induced enterocolitis syndrome. *Allergy* 2008;63:1645-1646