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ORIGINAL ARTICLE

Single and multiple food allergies in infants with proctocolitis☆

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Abstract
Background: Food protein-induced allergic proctocolitis is a frequent cause of rectal bleeding in infants. Characteristics of infants with multiple food allergies have not been defined.
Objective: This study aimed to identify characteristics of infants with proctocolitis and compare infants with single and multiple food allergies.
Methods: A total of 132 infants with proctocolitis were evaluated retrospectively. All of the infants were diagnosed by a paediatric allergist and/or a paediatric gastroenterologist according to guidelines. Clinical features of the infants, as well as results of a complete blood count, skin prick test, specific immunoglobulin E, and stool examinations or colonoscopy were recorded.
Results: Cow's milk (97.7%) was the most common allergen, followed by egg (22%). Forty-five (34.1%) infants had allergies to more than one food. Infants with multiple food allergies had a higher eosinophil count (613 ± 631.2 vs. 375 ± 291.9) and a higher frequency of positive specific IgE and/or positive skin prick test results than that of patients with a single food allergy. Most of the patients whose symptoms persisted after two years of age had multiple food allergies.
Conclusions: There is no difference in clinical presentations between infants with single and multiple food allergies. However, infants with multiple food allergies have a high blood total eosinophil count and are more likely to have a positive skin prick test and/or positive specific IgE results.

Introduction

Food protein-induced proctocolitis (FPIAP) is frequent in infants and has a transient course. Otherwise healthy infants with FPIAP usually have streaks of blood mixed with mucus in the stool.[1,2] The exact prevalence of FPIAP is unknown and

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its estimated prevalence ranges from 18 to 64% in infants with rectal bleeding.[3–5]

Diagnosis of FPIAP is based on clinical manifestations. Tests that identify the offending food proteins are lacking. Specific immunoglobulin E (sIgE) levels and the skin prick test (SPT) have limited assistance in diagnosis.[6,7] Usually negative or slightly positive test results for FPIAP are obtained.[8]

Definitive diagnosis of FPIAP is confirmed by oral food challenge tests. These tests are performed after complete resolution of symptoms by an elimination diet or switching to a hydrolysed hypoallergenic/amino acid-based formula.[9,10] Cow's milk protein is initially eliminated from the infant and mother (if breastfeeding), and symptoms typically resolve within 72–96 h.[1,11,12] If bloody stool or other complaints persist, eliminating common allergens, including soy, egg or other suspected foods, from the diet is considered.[1] When the history is convincing and the infant responds to an elimination diet, there is no need for further invasive examinations.[13]

Characteristics of infants with proctocolitis have been defined. However, characteristics of these infants with multiple food allergies have not been described.[7,14,15] Therefore, this study aimed to identify characteristics of infants with FPIAP and compare infants with single and multiple food allergies.

Materials and methods

This study comprised 132 infants who were diagnosed with FPIAP in paediatric allergy and/or paediatric gastroenterology outpatient clinics between April 2011 and December 2014. We recorded age at onset of symptoms, age at diagnosis, initial symptoms, positive physical examination findings, atopic history, family history of atopy or asthma, allergenic food(s), whether the infant had measurement of total IgE and sIgE levels and a skin prick test performed (cow's milk, egg, wheat, peanut, soy, negative, histamine, and any other suspected food), leucocyte, eosinophil, and thrombocyte counts, stool examination results, and whether the infant had histopathological findings from colonoscopy.

Infections and other causes of rectal bleeding, such as invagination, volvulus, Hirschsprung's disease, and necrotising enterocolitis, were excluded. Definitive diagnosis of FPIAP depended on the medical history, small and bright red rectal bleeding with mucus in an otherwise healthy neonate or infant, and oral food challenges (disappearance of rectal bleeding after an elimination diet and recurrence of rectal bleeding after administration of the offending food).[9,10]

At enrolment if SPT/sIgE results were negative, all the breastfeeding mothers as well as infants with supplementary feeding initially received a cow's milk elimination diet. Infant formulas were changed with an amino-acid based formula. If the complaints did not resolve in two weeks, additional offending foods were examined and eliminated from the diet of both the breastfeeding mother and/or the infant with supplementary feeding. If SPT/sIgE results were positive, that food was initially eliminated from the diet. Egg elimination was the second eliminated food from the breastfeeding mother and the infant if tests were negative. Mothers of exclusively breastfed infants with MFA were multiple restricted and these carried on in the infant.

If the complaints resolved after two weeks of a symptom-free period a food challenge was performed to determine recurrence of symptoms. We performed food challenge first to breastfeeding mother then to infant with supplementary feeding after two weeks of symptom free intervals.

If rectal bleeding or symptoms of proctocolitis did not recover with an elimination diet, endoscopic evaluation was performed to confirm the diagnosis and to exclude other reasons of rectal bleeding by a paediatric gastroenterologist with a videocolonoscope (Olympus®, Tokyo, Japan). Biopsy specimens were taken from areas of lesions and a histological examination was performed by a pathologist.

A food challenge to an open diet was performed in allergic patients with proctocolitis after a six-month diet as early as nine months of age. Challenge protocols were performed based on a food allergy work group report and EAACI position paper.[16,17] If the provocation test was negative, patients continued to receive the challenged food at home. Their parents were informed about late-phase reactions and were asked to return to the elimination diet if any of these reactions occurred. At the end of one week, a phone call was arranged with mothers who were asked if the infants had had any symptoms of proctocolitis. In August 2015, we performed a telephone interview of all the families of patients and questioned them about their children's food allergies.

This study was approved by Baskent University Institutional Review Board (project no: KA16/66). Oral informed consent was obtained from the families of the study participants.

Statistical analysis

Data were analysed using SPSS 17.0 statistical software (SSPS Inc., Chicago, IL, USA). The results of statistical analysis are expressed as the number of observations (n) and mean ± standard deviation (SD). Shapiro–Wilk's test was used to assess the normality of distribution of the variables. Levene's test was used to assess the homogeneity of variance among the groups. Comparisons of group means were performed with the Student's t test. The chi-squared test was used for comparison of frequencies. A p value <0.05 was considered statistically significant.

Results

A total of 132 infants (63 males, 69 females) were included. Cow's milk ($n = 129$, 97.7%) was the most common allergen, followed by egg ($n = 29$, 22%). Twenty-six (19.7%) infants had both milk and egg allergies and three infants had only an egg allergy. Eleven infants had hazelnut and peanut, nine had wheat, five had fish, two had lentil, two had sesame, one had potato, one had corn, and one had spinach and rice allergies.

Eighty-seven (65.9%) infants had an allergy to one food, whereas 45 (34.1%) infants had allergies to more than one food (Table 1). Infants with multiple food allergies had a higher eosinophil count than those with a single food allergy (613 ± 631.2 vs. 375 ± 291.9, $p < 0.05$).

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