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Original article

Knowledge and practice of physicians and nutritionists regarding the prevention of food allergy

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SUMMARY

Background & aims: To evaluate the knowledge and practice of pediatricians, pediatric gastroenterologists, allergists and nutritionists regarding the primary prevention of food allergy.
Methods: A descriptive, cross-sectional study that enrolled pediatricians ($n = 80$), pediatric gastroenterologists ($n = 120$), allergists ($n = 100$) and nutritionists ($n = 220$). A self-administered questionnaire concerning the current recommendations was used.
Results: Despite the lack of current recommendations, 17.1% ($n = 89$) of all professionals, mainly nutritionists, recommended a maternal exclusion diet during pregnancy. More professionals in the sample group, 40.8% ($n = 212$), recommended a maternal exclusion diet during breastfeeding, and the rates of recommendation were higher in nutritionists and pediatricians compared to allergists and pediatric gastroenterologists ($p < 0.001$). Regarding the recommended timing of the introduction of complementary feeding, 41.9% ($n = 218$) of the professionals recommended modifying the age of introduction to prevent the development of food allergy. The majority of the professionals believed that prebiotics (61.2%; $n = 318$) and probiotics (44.4%; 231) prevent the development of food allergy. The recommended age of introduction for the main allergenic foods was 12 months.
Conclusions: This study revealed that there are gaps in the knowledge of professionals about the primary prevention of food allergy.

1. Introduction

Currently, there is a strong interest in the primary prevention of food allergy due to the considerable increase in the incidence of allergic diseases, mainly in Western countries.[1] Given the gravity of some allergic conditions and their implications for the quality life of the patient and their family, the primary prevention of food allergy has become a public health priority in developed countries and has become a matter of concern in developing countries.[2]

Allergic diseases comprise a combination of clinical manifestations, such as asthma, rhinitis, conjunctivitis, atopic dermatitis and food allergy. Food allergy is the primary allergic manifestation in infancy, which typically is a cow's milk protein allergy.[3] This allergy is more frequent in infants that receive infant formulas or whole cow's milk but can also occur in exclusively breastfed infants due to the passage of food allergens ingested by the mother's diet into the mother's milk.[4]

Food allergy burdens increase the costs of the health system and lead to hospital admissions, specialized attendance, the expense of subsidiary exams and the use of specialized infant formulas. The major treatment remains the exclusion of food that contains the allergic protein for a determined period until the acquisition of tolerance.[5] Nevertheless, strategies for the primary prevention of food allergy were recently reviewed, and new guidelines were established.[6–13]

Because new treatments are established based on the results of research, the clinical practice of health professionals should include a constant updating of their knowledge. The identification of at-risk subjects enables health professionals to monitor the patient and to offer specific guidance to reduce the chance of developing a food allergy. Primary prevention practice includes guidance about infant foods, including the duration of exclusive breastfeeding, the use of specialized infant formula and complementary feeding.

Most of the time, the guidance in infancy is determined by a professional who has frequent contact with the mother and the infant. Therefore, it is important for health professionals to be able to provide recommendations that are supported by scientific evidence and not to suggest practices that expose the infant to nutritional risk or to factors that can enhance the chances of

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developing a food allergy. Hence, the present study aims to evaluate the knowledge and practice of physicians and nutritionists about the prevention of food allergy.

2. Material and methods

This was a descriptive, cross-sectional study that included pediatricians, pediatric gastroenterologists, allergists and nutritionists. The participants were selected by approaching the professionals at scientific meetings: Brazilian Congress of Nutrition (June/2009), Brazilian Congress of Allergy and Asthma (October/2009), Brazilian Congress of Pediatric Gastroenterology and Congress of Pediatrics of the State of São Paulo (March/2010). A self-administered questionnaire was prepared by the authors. The questionnaire was based on the current recommendations of the major committees and societies related to the prevention of food allergy: the Brazilian Society of Pediatrics, the Brazilian Association of Allergy and Immunology, the American Academy of Pediatrics, the European Society of Pediatric Allergy and Clinical Immunology, the European Society for Pediatric Gastroenterology, Hepatology and Nutrition, the Section on Pediatrics of the European Academy of Allergology and Clinical Immunology and the Australasian Society of Clinical Immunology and Allergy published since 1999 until 2008.[6–13]

The questionnaire included a section that was focused on the identification of the professional. The second part of the questionnaire contained specific questions about the groups of infants considered to be at high risk for the development of food allergy, the recommendations on a maternal exclusion diet during pregnancy and breastfeeding and the list of foods that might be excluded (peanuts, cocoa, coffee, pork, meat, colorants, beans, seafood, cow's milk, eggs, fish, soybean and wheat). The questionnaire also asked about the recommendation of modifying the time of introduction of complementary feeding, the influence of the type of delivery on the development of allergic diseases, the use of prebiotics and probiotics for the prevention of food allergy, the age of introduction of the main allergenic foods and the factors related to the constitution of the intestinal microbiota.

The study was approved by the research ethics committee of the Federal University of São Paulo (UNIFESP). Authorization for data collection during all of the scientific meetings was previously granted by the Conference Committee. All of the participants signed a written consent.

The data collected through the questionnaires were entered into Microsoft Excel (2007 version, Redmond, WA, USA). The data processing and statistical analysis were performed using SigmaStat in SigmaPlot® (version 11.2, 2009–2010, Systat Software, San Jose, CA, USA) and Statcalc in Epi-Info® (version 3.5.1, 2008, Atlanta, GA, USA).

For the statistical analysis of continuous variables with normal distributions, a one-way analysis of variance (ANOVA) was used and was complemented by Tukey's test of multiple comparisons when appropriate. The frequencies and proportions were compared using the χ^2 test or Fisher's exact test complemented by the partitioning of the χ^2 test when appropriate. The alpha error was established as 5% for the rejection of the null hypothesis. Bonferroni's correction for the adjustment of the alpha value was used for the comparisons between six possible the pairs of professionals ($p < 0.008$).

3. Results

The data were collected during 4 scientific meetings between March 2009 and March 2010. The total sample consisted of 520 professionals: pediatricians ($n = 80$), pediatric gastroenterologists ($n = 120$), allergists ($n = 100$) and nutritionists ($n = 220$). Regarding the gender of the participants, 470 (90.4%) were female and 50 (9.6%) were male. The distribution of gender among the specialties was 215 (97.7%) female nutritionists, 65 (81.2%) female pediatricians, 106 (88.3%) female pediatric gastroenterologists and 84 (84.0%) female allergists. The mean age of the professionals was 29.1 ± 5.8 years, and the mean (±standard deviation) professional experience was 7.2 ± 5.8 years.

The groups of infants that were identified by the professionals as those considered to be at high risk for developing a food allergy are presented in Table 1. According to the professionals, the main groups that are considered to be at high risk were, in decreasing order, infants with a family history of allergic diseases (91.9%), preterm newborns (66.2%), wheezing infants (63.1%), low-birth-weight newborns (54.8%) and infants with gastroesophageal reflux (43.1%). Only the family history of allergic disease is the correct answer.

The results regarding the recommendation of a maternal exclusion diet during pregnancy and breastfeeding, modifying the time of introduction of complementary feeding, the influence of the type of delivery in the development of allergic diseases and the use of prebiotics and probiotics in the prevention of food allergy are described in Table 2. Regarding the recommendation of a maternal exclusion diet during pregnancy, 17.0% of professionals agreed with such a practice, and nutritionists had the highest rate of recommendation. The pediatric gastroenterologists statistically differed from the other professionals and had the lowest rate of recommendation. A maternal exclusion diet during breastfeeding was recommended by 40.8% of the sample, with higher rates of recommendation by nutritionists and pediatricians compared to allergists and pediatric gastroenterologists. The main foods chosen for exclusion in the maternal diet during pregnancy were similar to those excluded during breastfeeding: peanuts, colorants, seafood, cow's milk, eggs and soybeans (data not shown).

Regarding the time of introduction of complementary feeding, 41.9% of professionals recommended modifying the age of introduction to prevent the development of food allergy. The highest recommendation rate was found among allergists. The participants' answers regarding the age of introduction of the main allergenic

Table 1
Answers to the question: "Which one(s) of the group(s) do you consider to be infants at high risk of developing food allergy?".

	Nutritionists ($n = 220$)	Pediatricians ($n = 80$)	Pediatric gastroenterologists ($n = 120$)	Allergists ($n = 100$)	Total ($n = 520$)	p
Infants with a family history of allergic disease	199[a] (90.5%)	72[a] (90.0%)	113[a] (94.2%)	94[a] (94.0%)	478 (91.9%)	0.488*
Pre-term newborns	126[a] (57.3%)	58[a,c] (72.5%)	93[b,c] (77.5%)	67[a,c] (67.0%)	344 (66.2%)	<0.001*
Wheezing infants	94[c] (42.7%)	73[a,d] (91.2%)	82[b] (68.3%)	79[a,b] (79.0%)	328 (63.1%)	<0.001*
Low-birth-weight newborns	147[a] (66.8%)	29[b] (36.3%)	71[a,c] (59.2%)	38[b,c] (38.0%)	285 (54.8%)	<0.001*
Infants with gastroesophageal reflux	105[a,b] (47.7%)	18[c] (22.5%)	72[a] (60.0%)	29[b,c] (29.0%)	224 (43.1%)	<0.001*

*χ^2 test: the different letters in the rows represent statistically significant differences ($p < 0.008$) taking into account Bonferroni's correction.