

RISK FACTORS OF ALLERGIC DISEASES

Nikoleta Poliaková¹

¹ Faculty of Healthcare, Alexander Dubček University of Trenčín, Študentská 2, 911 01
Trenčín, Slovak Republic

* Corresponding author E-mail address: nikoleta.poliakova@tnuni.sk

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Abstract

Objective: The aim of presented paper was to determine relationship of the development of allergic diseases and child's age, gender, family history of allergy, breastfeeding, supplementation or mother's nutrition during breastfeeding.

Methods: The research method of questionnaires was designed for healthy and allergic children. The sample consisted of 228 healthy children aged 0-15 years and 183 allergic children aged 0-15 years.

Results: The research results indicated that the development of allergic diseases was significantly related to age, genetic predisposition, and duration of exclusive breastfeeding. The risk of allergic diseases increased with early supplementation with milk substitute formulas and citrus consumption during lactation.

Conclusion: The results can be applied in the care of children and adolescents.

Keywords: allergic diseases, risk factors, children, prevention

1 Introduction

The incidence of allergic diseases has dramatically upward trend. It was estimated that up to 40% of the world's population has atopia (1). Number of individuals who have atopic predisposition with clinical manifestations is about 20 - 25% (2). Especially incidence of skin and respiratory allergies is rising (allergic rhinitis and bronchial asthma), but the major problem is the continuous increase in the prevalence of food allergy. Allergic diseases are therefore of the most common diseases in the paediatric population (3).

Although allergic diseases are not associated with high mortality rates, significantly reduce the individual experiencing quality of life (4). This leads to an effort to find the most effective ways for prevention (5).

2 Description of the approach, work methodology, materials for research

The aim of our study was to find relationships between age and sex of children and duration of exclusive breast-milk, substitute formulas supplementation, beginning administration of raw cow's milk, adherence of hypoallergenic diet for breastfeeding mothers and the development of allergic diseases.

The sample included 409 children; of which were 228 healthy children (0-15 years old) and 183 children (aged 0-15 years) were allergic. All of them were dispensary in allergy clinics in Trenčín region. The average age of healthy children was 8.81 years. Sample consisted of 125 healthy children girls (55.3%) and 101 boys (44.7%). The average age of affected children was 9.83 years. Sample of sick children consist of 88 girls (48.1%) and 95 boys (51.9%). The average age found in children with allergic disease was 5.33 years. We used questionnaires to parents of healthy and allergic children. We investigated the duration of exclusive breastfeeding, beginning supplementation and compliance of hypoallergenic diet for breastfeeding mothers.

In data processing, we used non-parametric tests. For comparison of two independent variables non-parametric Mann-Whitney test was used.

3 Results

Gender and order of the child in the family had not an important role in the development of allergies. Conversely, age and history of allergies in the family of allergic child are very significantly associated with allergies (table 1).

Table 1 Basic parameters of children

Parameter	Health children		Allergic children		p
	n	x	n	x	
Gender	226	1.553	183	1.475	0.176
Age	226	8.810	183	9.830	0.002
Birth order	226	1.717	183	1.585	0.142
History of allergies in the family	226	1.624	183	1.388	<0.001

Legend: n-number of individuals; x-arithmetic mean; p- statistical significance of the Mann-Whitney test result

The nutritional factors (table 2, fig.1) showed statistically significant differences between the both groups of health and allergic children. Especially breastfeeding ($p = 0.003$) and supplementation ($p = 0.004$), have been significantly lower in allergic children. Healthy children were breastfed longer and feeding with supplementation formulas and cow's milk started later than in allergic children. Hypoallergenic diet of lactating mothers had not significant effect except citrus consumption ($p = 0.033$).

Table 2 Effect of nutritional parameters of children

Parameter	Healthy children		Allergic children		p
	n	x	n	x	
Breastfeeding	226	4.580	183	3.945	0.003
Supplementation	226	5.340	183	4.378	0.004
Cow's milk	226	4.773	181	4.524	0.191
Milk products	226	3.650	181	3.729	0.383
Hypoallergenic diet					
Seasoning	226	1.570	181	1.635	0.286
Citrus	226	1.552	181	1.425	0.033
Cow's milk	226	1.042	181	1.082	0.489
Strawberries	226	1.210	181	1.243	0.587
Tomato	226	1.187	181	1.154	0.573
Chocolate	226	1.070	181	1.09	0.689
Other	226	1.080	181	1.06	0.692

Legend: n-number of individuals; x-arithmetic mean; p- statistical significance of the Mann-Whitney test result

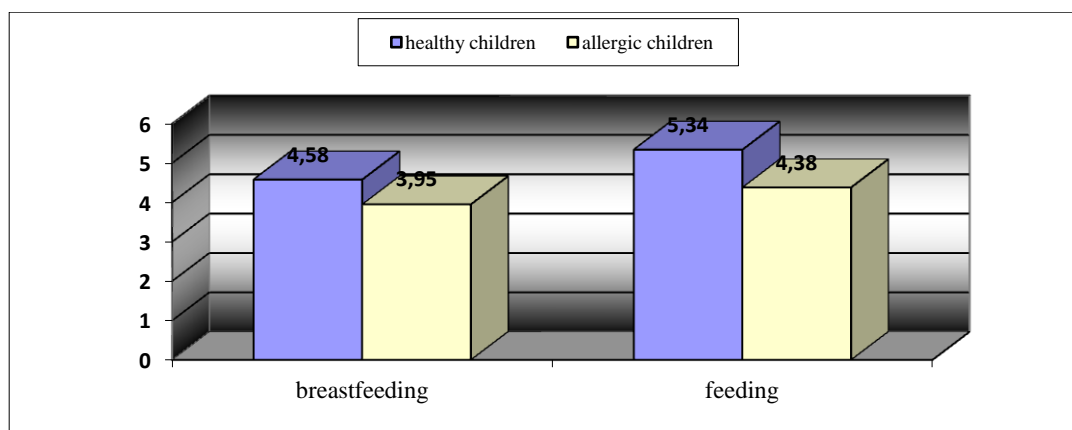


Fig. 1 Significant nutritional impact – breastfeeding and feeding

4 Description of achieved results

Monitoring of health status of population of the Czech Republic and Slovakia in relation to the environment showed, that the incidence of allergic diseases in 2006 doubled compared to 1996 and is dependent on age of child. Atopic eczema is typical for younger children whereas hay fever (coryza spasmodica) is symptomatic for older children. Especially with adolescents there is evident accumulation as they grow up. The incidence of asthma reached its peak in 2006 in the age of thirteen years old children which is doubling in the comparison with five year old children (6, 7).

Results of our research in relation to the incidence of allergy type and age of children corresponded with the above findings. The average age of children was 9.83 years. Only 84.2% of children had allergy of airway disease. In second place was eczema. Children suffer polyvalent form of allergy. Most of the children had positive skin tests to more types of allergens. We found a significant relationship between the incidence of allergies and age. Allergy increased significantly with the age of the child ($p = 0.002$) and the incidence of allergies in the family ($p = 0.001$). Effect of genetic disposition was confirmed by several clinical studies. In the Finnish study Jaakola et al. (8) examined 521 asthmatic children and 932 controls and found that the strongest risk factor for the development of asthma in children is asthma parents.

In our study, we examined the relationship of the duration of breastfeeding, the beginning of feeding with milk formulas or cow's milk and hypoallergenic diet for breastfeeding mother. It has been confirmed, that the length of exclusive breastfeeding is an important factor in the prevention of allergy ($p = 0.003$). The number of breast-fed infants was observed in both sets approximately equal (healthy children - 87%; allergic children - 85%). Allergic children were exclusively breastfed less than healthy children. Of the total number of healthy infants, were exclusively breastfed until 6 months of their life, almost 45%, while only 20% of allergic children were exclusively breastfed a such long time. Many studies point to the fact that exclusive breastfeeding for at least 4-6 months could protect against the development of allergic diseases (9, 10).

Further we examined the starting time of administration of replacement dairy products and cow's milk in the diet of the child and its impact on the emergence of allergies. In a group of healthy respondents 75 of children (33.2%) do not need to supplement substitute milk formulas. In the group of allergic children, 16.9% of children do not need to supplement substitute milk formulas. Study of Bener et al. (9) have shown, that asthma, wheezing, allergic rhinitis and eczema were less common in children exclusively breast-fed compared to breastfed children who were simultaneously feeding with milk formulas. Cow's milk was clustered in both groups without significant differences. In the group of allergic children was

included cow's milk in the diet of the child before reaching the first year of their life by 41%, in the group of healthy children by 40%. The average age including of cow's milk in the diet of healthy children was 13.06 months, of sick children 12.34 months. On the other side, in the group of allergic children cow's milk was included into the diet of children before reaching the sixth month by 13.7%, while in the group of healthy children only by 5.7%.

The next issue was the extent to which maternal diet during lactation affects atopic child development. As recommended by WHO and WAO compliance hypoallergenic diet during lactation is not necessary (11). Our research also confirmed that the hypoallergenic diet of lactating mothers had not a significant influence on the development of allergies, in addition to eating citrus. Consumption of citrus by mothers during breastfeeding can be considered as an important factor for development of allergy.

5 Conclusion

In response to the loading of allergic diseases for individuals and society, continuous search for preventive measures to prevent sensitization and worsening of the clinical expression of allergy is needed. The research results indicate, that breastfeeding is an important factor that reduces the risk of allergic diseases. Nurses should be more involved in programs and projects to promote breastfeeding, work in lactation counseling, in cooperation with the parent advisory centers keep on breastfeeding, proper sizing based foods and the principles of nutrition of infants and toddlers. If the breastfeeding is not possible, then should be risk families encouraged to use hypoallergenic products as alternative infant nutrition.

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*Review: Dušan Poliak
Eva Červeňanová*