

PREVALENCE OF ASTHMA AND ALLERGY IN CHILDREN 2016

1. Introduction

In 2016, a children's health study was conducted, monitoring both the children's health and levels of chemicals in the body. The study included a questionnaire survey aimed at allergic diseases, obesity, cardiovascular risk factors, and locomotor disorders in childhood. The questionnaire also contained questions about eating habits. Blood and urine samples for the analysis of selected biomarkers of exposure to chemicals and nutritional biomarkers were collected from children of five cities. The study was supported by the Society of General Paediatricians.

The monitoring was conducted during the preventive check-ups of children aged five, nine, 13, and 17 years in surgeries of 46 general paediatricians in selected cities (Praha, Brno, České Budějovice, Jihlava, Olomouc, Hradec Králové, Liberec, Jablonec nad Nisou, Ústí nad Labem, Kladno, Mělník, Hodonín, Ústí nad Orlicí, Žďár nad Sázavou, Sokolov, Most, and Kutná Hora) of the Czech Republic (CR). The participating paediatricians were selected with respect to the city size to obtain a representative sample of about 1,500 children in each age group. The children were included in the study at random by the paediatrician when presenting for preventive check-ups according to the month of birth. Each participating paediatrician was supposed to examine 30 children from each age category, i.e. 120 children in total. Anonymized check-up data and other data, particularly on allergic diseases, were provided based on parental informed consent. The data on the child's diseases and life style were taken from the parental questionnaire.

The samples of biological material for analyses of foreign (lead, cadmium, mercury, arsenic, and phthalate metabolites) and beneficial substances (selenium, iodine, and vitamin D) were collected from five-year-old and nine-year-old children in selected cities (Prague, Liberec, Ostrava, Žďár nad Sázavou, and Kutná Hora). Results are presented in Chapter 6.

2. Allergic diseases

Overall, data on 6,329 children were available for the purposes of standard assessment of the incidence of allergic diseases and their trends in the CR. Boys and girls were equally represented (51% of males and 49% of females). Each age group (5, 9, 13, and 17 years) comprised around a quarter of the cohort under study.

A total of 1,861 children, i.e. 29% of the study cohort, were physician diagnosed with an allergic disease (and followed up for allergy). The incidence of allergic diseases was increasing with increasing age from 22% in five-year-olds to 35% in 17-year-olds. Males were significantly more affected (32%) by allergic diseases in general and by respiratory allergy in particular than females (27%) ($p < 0.001$). The incidence of different allergic diseases is indicated in Tab. 2.1.

Ten percent of children were diagnosed with asthma. Boys were more often affected than girls, and the incidence of asthma was increasing with increasing age. Based on the asthma control test administered to 222 asthma patients aged 13 and 17 years, about half of the respondents achieved full asthma control, 41% partial asthma control, and 12% poor asthma control.

Thirteen percent of children were diagnosed with seasonal pollen rhinitis. Significantly more patients were boys, and the incidence of seasonal pollen rhinitis was increasing with increasing age. The incidence of year-round allergic rhinitis is also significantly higher in boys and is increasing with increasing age.

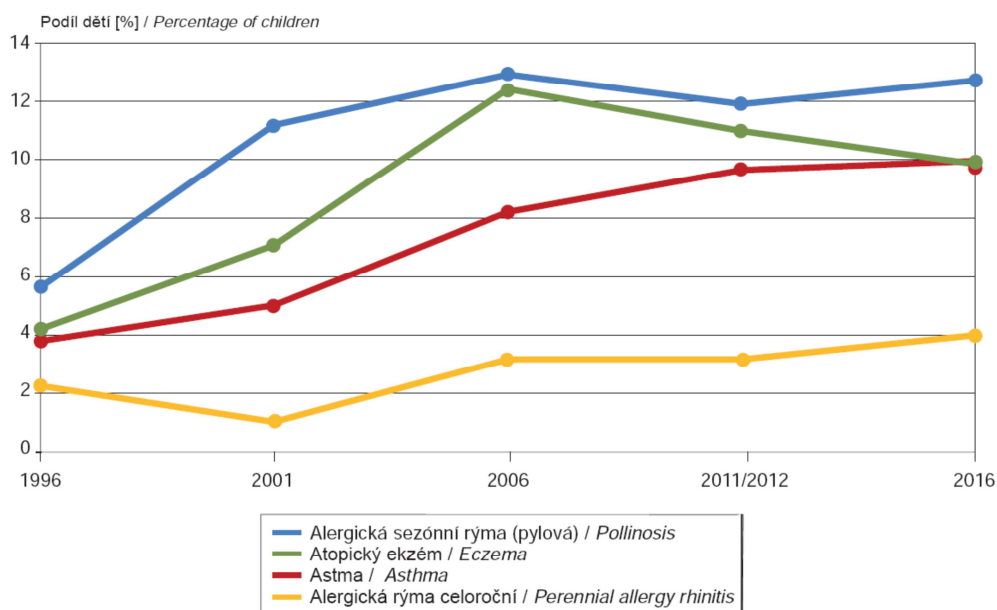
Tab. 2.1 Prevalence rate of allergic diseases in children, 2016

Age (years)	No. of children	% of children with any allergic disease	% of children diagnosed with:					
			Asthma	Seasonal pollen rhinitis	Year-round allergic rhinitis	Atopic eczema	Food allergy	Other allergic disease
5	1 612	22	6	6	3	10	2	4
9	1 621	29	10	12	4	11	3	6
13	1 589	32	12	15	5	10	3	4
17	1 507	35	12	19	5	8	3	6
Males	3 221	32	12	14	5	10	3	5
Females	3 108	27	8	11	3	10	3	5
Total	6 329	29	10	13	4	10	3	5

Ten percent of children were diagnosed with atopic eczema, comparably in both sexes and all age groups.

Three percent of children were diagnosed with food allergy based on testing, comparably in both sexes and all age groups. Based on the parental data, eight percent of children develop an allergic reaction to certain foods, but only a quarter of them tested positive for food allergy. The most common was the reactivity to various fruits (kiwi, citrus fruits, apples, or strawberries), vegetables (most often tomatoes), nuts, dairy products, and chocolate.

Fig. 2.1 The trends of allergy prevalence in Czech children 1996 - 2016



The factors causing allergy based on skin tests or IgE antibodies were grass pollen, mites, birch tree pollen, and herbal pollen.

The trends in allergic diseases in childhood can be determined since 1996 when the monitoring was started (Fig. 2.1). Between 1996 and 2006, there was a significant increase in the prevalence of allergic diseases from 17% to 32% ($p < 0.001$). The increase stopped in 2011, and the prevalence showed a slight decrease to 30% ($p = 0.007$). The prevalence of allergic diseases was 29% in 2016, being the same as in 2011. The prevalence of allergic diseases did not change in any age groups since the previous investigation. The only change was observed for atopic eczema, the prevalence of which slightly declined from 11% in 2011 to 10% in 2016 ($p = 0.037$).

3. Respiratory problems

The parents reported respiratory problems in their children during the last year, particularly acute inflammation of the upper respiratory tract and bronchi, and problems unrelated to common colds or acute disease. Frequent episodes of upper respiratory tract inflammation (more than five episodes per year) were reported in one in four children and even in one in three in the youngest, five-year-old children. These problems were significantly more common in children whose parents reported the presence of heavy traffic or an industrial source of pollution close to the place of residence or who lived in smoking households. Frequent acute bronchial inflammation with general symptoms (fever and/or irritant cough, more than three episodes per year) were reported in 10% of children, and the most affected were once again the smallest children. The negative effect of the sources of pollution situated near the place of residence as reported by parents was also demonstrated. In smoking households, recurrent episodes of bronchial inflammation were only slightly more common than in non-smoking households, but the children in the former households were more frequently treated with antibiotics. A significantly higher prevalence of eye and nose irritation and wheezing unrelated to colds was found in children whose parents reported the presence of heavy traffic or an industrial source of pollution near the place of residence or lower quality of the indoor environment (smoking households or indoor moulds).