

THE ASTHMA PHENOTYPE IN PEDIATRICS

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The prevalence of asthma and atopy has been rising steadily over the past two or three decades, particularly in areas of increased urbanization. It is well known that allergic diseases occur as a consequence of genetic and environmental interactions. Since allergic diseases have been increasing in recent decades, the impact of environmental factors on the prevalence of allergic diseases has become a growing concern throughout the world. Improving our understanding of the causes of increase in allergic diseases may help to improve treatments and preventive strategies. Early infancy seems to be a period of particular susceptibility to sensitization, as indicated by epidemiological and experimental studies. There is increasing evidence that both prenatal and perinatal events influence both allergic diseases and early-life respiratory morbidity, for example, the season of birth may affect the future development of allergy.

Aim of the study: This is an observational study of pediatric patients with asthma disease in Mures county. Our goal in this study was to analyze the relation between the month of birth and sensitization to inhalant and food allergens. Also we wanted to demonstrate the difference between sensitization to various allergens in children exposed to cigarette smoke compared with children not exposed to cigarette smoke.

Methods: Our prospective study included 180 asthmatic children, with ages between 0 and 18 years, who were admitted to the Clinic of Pediatrics I from Târgu Mureș, Romania, between January 2008 and December 2011. We divided the patients in two phenotype groups: asthma group with tobacco exposure (50 patients) and asthma group without tobacco exposure (130 patients). We also studied the age, month of birth, sensitization to a given antigen (Dermatophagoides pteronyssinus, Dermatophagoides farinae, pollen, milk proteins, egg, mold, dog epithelium, cat epithelium, soya, carrot, potatoes, peanuts). Specific IgE serum levels to allergens were measured. RAST equal or higher than class 1 was considered as positive. This data was combined with the presence of different types of allergens during the year. Statistical analysis of the data was performed using a program for biomedical research MedCalc statistics, namely GRAPH Pad Prisma. Analysis of the relationship between two variables and intensity of this connection was made with the Pearson correlation coefficient r . To see if there is an association between exposure to tobacco smoke and sensitization to various allergens, a table of 2×2 contingency was used applying chi square test, estimated risk OR (odds ratio) was calculated and values of $p < 0.05$ was considered statistically significant.

Results and conclusions: In our region the allergic sensitisation to asthmatic children achieve quotas similar to those in the literature (76%). This is the first study showing the association of atopy with the date of birth in the asthmatic children in România. Regarding the incidence of asthmatic phenotype apparently allergic sensitization is more common at children born in February (15.5%), April (13.2%), March (10.9%) and May

(10.5%). Our results support the hypothesis that the first months of life is a sensitive period in which the decreasing exposure to allergenic pollen type may be associated with decreased awareness to pollen. Two-thirds of asthma children without cigarette smoke exposure had allergic sensitization. We found allergic sensitization to perennial environmental allergens in more than half of asthmatic patients. Children with bronchial hyperactivity born in the first half of the year are more commonly atopy type. The planning period of the birth of the future is a possible recommendation for parents with a family history of allergy to pollen. This is the first study in this area, possibly in Romania, which evaluated the sensitivity to food and inhaled allergens in asthmatic children. For patients with an asthma panel Ig E specific test consisting of dust mites, grass pollen, fungi, possibly epithelia of cat or dog can be helpful in identifying individuals sensitized, and for sensitivity, a panel composed of proteins allergenic cow's milk, wheat, egg, nuts, peanuts, we can be of help. Enrollment into clinical practice pediatric patients with asthma in one of three categories: phenotype with allergic sensitization, phenotype without allergic sensitization or phenotype with cigarette smoke exposure, it is extremely relevant in shaping perspective of disease control, quality of life and improvement of the prognosis of these patients. Sensitization to environmental allergens in children exposed to cigarette smoke compared to the group non exposed: there is a 3.3 times greater likelihood of developing *Dermatophagoides pteronissimus* sensitivity in children exposed to tobacco smoke than those not exposed ($p=0.0007$) and also a 2.3 times greater likelihood of developing *Dermatophagoides farinae* sensitivity in children exposed to tobacco smoke than those not exposed ($p=0.02$). Our study shows a 2.44 times greater probability of developing sensitization to milk in children exposed to tobacco smoke than those not exposed ($p=0.01$). No significant association was identified for mold, cat or dog. This data indicate that exposure of children to specific air pollution, cigarette smoke increases the risk of IgE sensitization to environmental allergens and food allergens. The best way to protect children from exposure to tobacco smoke, except smoking ban is smoking outside the home behind closed doors. Society, including health ministry must make further efforts to train and support smoker parents. According to our study, by reducing children's exposure to cigarette smoke can prevent asthma sensitizations in children in Mures County.