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ORIGINAL ARTICLE

Prevalence and risk factors for wheezing and allergic diseases in preschool children: A perspective from the Mediterranean coast of Turkey



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Abstract

Objectives: The aim of the present study was to determine the prevalence and risk factors of allergic diseases in preschool children from one of the biggest cities in the Mediterranean Region of Turkey.

Methods: The study population included 396 preschool children attending to urban daycare centres in Mersin. In the first stage, a comprehensive standardised questionnaire modified from the International Study of Asthma and Allergies in Childhood (ISAAC) was employed. In the second stage, serum food and inhalant specific IgE, and skin tests were performed in 45 children with frequent wheezing and 28 children with no wheezing.

Results: The prevalence of ever wheezing, current wheezing, physician-diagnosed asthma, allergic rhinitis and eczema were 53% (210), 33.3% (132), 27.3% (108), 13.4% (53) and 8.3% (33), respectively. A family history of atopy (OR=2.5, 95% CI: 1.3–4.7, $p=0.004$), dampness at home (OR=2.4, 95% CI: 1.2–4.8, $p=0.008$), a history of intestinal parasites (OR=4.3, 95% CI: 1.7–10.9, $p=0.002$), previous history of pneumonia (OR=6.9, 95% CI: 1.9–25.9, $p=0.004$), initiation of complementary foods before the age of three months (OR=6.1, 95% CI: 1.4–26.9, $p=0.02$) and presence of food allergy (OR=3.1, 95% CI: 1.1–9.2, $p=0.03$) were found to be significant risk factors for physician-diagnosed asthma. The risk factors for frequent wheezing were maternal smoking during pregnancy (OR=5.2, 95% CI: 0.9–28.7, $p=0.05$) and high serum IgE levels (OR=2.9, 95% CI: 0.9–9.0, $p=0.05$) at borderline significance.

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Conclusion: Our study was the first epidemiological study in preschool children in the Mediterranean region of Turkey and demonstrated a high prevalence of asthma and allergic diseases, probably related to humid climatic properties in addition to other environmental and genetic factors.

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Introduction

Asthma and allergic diseases are among the most common chronic disorders in children. A significant increase in the prevalence of allergic diseases has been observed in recent years.^{1,2} The results of studies investigating the prevalence of allergic diseases in different countries indicate significant differences. This may be related to different methods used in prevalence studies. The International Study of Asthma and Allergies in Childhood (ISAAC), the most comprehensive global study on the prevalence of asthma and allergic diseases in children, has introduced a standardisation for epidemiological research.³ According to the ISAAC Phase three study, the global prevalence for current asthma, rhinoconjunctivitis and eczema in the 6–7 years age group was 11.7%, 8.5% and 7.9%, respectively.⁴

Although many epidemiological studies related to asthma and allergic diseases are reported in school-age children,^{2,4} there is still limited data on the prevalence of respiratory and allergic diseases in preschool children. The epidemiological evaluation of the prevalence of respiratory and allergic diseases in 3–5 years aged children attending nursery schools demonstrated that 15% of children experienced at least one episode of wheezing, 5.5% of allergic rhinitis, 11% of children had a doctor diagnosis of asthma, 12% of children diagnosed as atopic.⁵ A previous study from Italy found that the prevalence of “wheezing in previous 12 months” and “doctor-diagnosed asthma” in preschool children were 12.1% and 8.6%, respectively.⁶ The prevalence of rhinitis in the last 12 months was found as 16.8% in preschool children.⁷

Allergic diseases are multifactorial which are influenced by various genetic and environmental factors. Since it seems unlikely that genetic factors contribute to the increasing trend, environmental factors might play an important role in the development of asthma and allergic diseases.⁸ The increase in allergic diseases in recent years can probably be explained by the change of lifestyles such as indoor air pollution, parental smoking, pet keeping, daycare attendance, respiratory tract and intestinal helminth infections, number of siblings, breastfeeding, and dietary habits affecting the immune system in the early stages of life.^{8–10}

The aim of the present study was to determine the prevalence and risk factors of respiratory and allergic diseases using a modified ISAAC questionnaire in preschool children attending daycare centres in the city of Mersin. This will be the first epidemiological study for respiratory and allergic diseases among the paediatric age group living in our city.

Materials and methods

Study design

The present study comprised two phases. Phase 1 was a prevalence study aimed to determine the prevalence of allergic diseases and risk factors by a modified ISAAC questionnaire. Phase 2 was the case-control study aimed to investigate the risk factors of children with frequent wheezing, including objective tests in addition to the questionnaire.

Study population

The study population comprised all children attending daycare centres in the city centre who were randomly selected from the list of all daycare centres in Mersin from January to December 2011. The modified ISAAC questionnaires were distributed to and collected through all children in these daycare centres. The study was approved by the ethics committee of the Mersin University, and written informed consent was obtained from the parents of all participating children.

Data collection

Phase 1

A modified ISAAC questionnaire was used to assess the symptoms of allergic and respiratory diseases, and the potential risk factors for the outcomes.¹¹ Basic ISAAC questions about respiratory symptoms and diagnosis, which have been previously validated in our country and other countries^{11–13} were not changed in this study. The modifications were related to cultural and geographic risk factors which included: Vitamin D supplementation status, entrance of some weaning foods such as yoghurt and milky biscuits, parasitosis history, presence of dampness and mould which are greatly anticipated in this humid Mediterranean region. The questionnaire included questions about the symptoms and diagnosis of respiratory diseases, eczema, food allergy and risk factors such as demographic characteristics, gestational factors, family history, feeding practices, household characteristics such as house crowding, presence of pets, dampness, and tobacco smoke exposure. The parents filled out the modified ISAAC questionnaire at home and returned it in a few days.

The prevalence of respiratory and allergic diseases were sought based on positive answers to these questions: (1) ‘Has

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