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Effects of dietary habits and risk factors on allergic rhinitis prevalence among Turkish adolescents

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ABSTRACT

Background: Allergic rhinitis (AR) is a global health problem affecting many people from childhood to adulthood. The aim of this study was to evaluate the prevalence of AR and related symptoms, and to assess the risk factors, dietary habits and the Mediterranean diet affecting AR.
Methods: In a cross-sectional study design, 9991 children, aged 13–14 years in 61 primary schools in 32 districts of Istanbul were evaluated. The prevalence of AR symptoms among the children was evaluated using the ISAAC protocol.
Results: In our study, total of 10,984 questionnaires were distributed to 13–14 yr-old schoolchildren to 61 schools in 32 district of Istanbul and 9991 questionnaires were suitable for analysis with an overall response of 91.7%. The rates of lifetime rhinitis, rhinitis in last 12 months and lifetime doctor diagnosed AR prevalence were 53.5%, 38.3% and 4.5%, respectively. The variation among districts in the prevalence of doctor diagnosed AR was very high. The highest prevalence was about 10 times higher than in the district with the lowest prevalence (range: 1.4–14.5) of Istanbul.

A family history of atopy, mother with a university degree, presence of cat at home during last 12 months and adenoidectomy were significant for increased doctor diagnosed AR risk. Additionally, although fish and other sea foods, fermented drinks made from millets and various seeds, animal fats and butter were independent risk factors for doctor diagnosed AR, fish oil and hamburger were protective foods for doctor diagnosed AR. The MD was not associated with the prevalence of doctor diagnosed AR.
Conclusions: This study shows that that there are wide variations for the prevalence of AR related symptoms in 13–14 yr-old schoolchildren among districts of Istanbul in Turkey. Socio-economical, environmental factors, some dietary habits, but not Mediterranean diet may affect the prevalence of AR.

1. Introduction

Allergic rhinitis (AR) is a global health problem affecting many people from childhood to adulthood [1]. It is a common disease and is characterized by nasal itch, sneezing, watery and mucous rhinorrhoea, and nasal obstruction [2].

The International Study of Asthma and Allergies in Childhood (ISAAC) program was designed (using standardized international methods) to allow comparisons of the prevalence of allergic diseases between populations in different countries and form the basis of further studies to investigate factors that potentially lead to these international patterns [3–6].

The prevalence of childhood AR shows wide variation throughout the world, ranging from 0.8% to 39.7% [7]. The prevalence rates for different regions of Turkey ranges from 2.9% to 31.0% [8–13]. However, based on Pub Med search, there are very few studies showing the prevalence rates of AR and related symptoms in Istanbul which is the largest city in Turkey [9,11].

In epidemiologic surveys, an increase in the prevalence of rhinitis has been reported [14–18]. The reasons for the global increase in prevalence of AR are still unknown, but various risk factors such as family history of atopy, month of birth, parental smoking, male sex and early exposure to allergens or pollutions have been described by epidemiological surveys [19–25]. However, major determinant contributing to the development of AR is still not clear.

The term "Mediterranean diet" (MD) refers to dietary patterns found in olive growing areas of the Mediterranean region. There are several variants of the Mediterranean diet, but some common components can be identified: a high ratio of monounsaturated to

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saturated fats; a high consumption rate of vegetables, fruits, pulses and grains; and moderate consumption of milk and dairy products [26]. These foods are important sources of dietary antioxidants. Antioxidants might have an important role in the pathogenesis of AR. Studies investigating the relationship between the Mediterranean diet and AR are very few [23–25]

In the present study, by using the ISAAC's self-response written questionnaire (WQ), we determined the prevalence of rhinitis and rhinitis-related symptoms among 13–14 yr-old schoolchildren living in all districts (32 districts) of Istanbul. Our secondary aim was to make comparisons between other cities in Turkey and other countries. Additionally, this study investigated the association between doctor diagnosed AR and dietary habits, especially Mediterranean diet.

2. Methods

2.1. Study area

The survey study was conducted in Istanbul which is the biggest metropolis, being home to 13.5 million people; and one of the greatest business and cultural centers of Turkey. The city constitutes 1/7 of Turkey's population with a surface area of 11,868 square kilometers [13]. It has 32 districts; they are shown on Istanbul, Turkey map in Fig. 1. The characteristic weather is a cooler version of the Mediterranean climate: a short spring, hot summer temperatures, a long autumn, and a rainy winter. Air pollution and heavy traffic can be considered to be the main problems of the city like all most metropolises.

2.2. Study population and design

The number of schools and children were calculated according to the number of children attending Grade 8 in each district. There were 181,271 children attending Grade 8 in Istanbul. Of those children, 5% from each district were planned to be included in the survey. According to this calculation, a total of 10,894 children aged 13–14 year in randomly selected 61 primary schools of 32 districts without selection by urban or suburban residence or variations in socioeconomic status were surveyed by the ISAAC questionnaire. The 13–14 yr age group was chosen to enable the use of self-completed questionnaire. Questionnaires were distributed by teachers for self-completion.

2.3. Questionnaire

The standardized core symptom questionnaire for 13–14 yr old was comprised six questions on symptoms relating to rhinitis or rhino conjunctivitis [27,28]. These questions were as follows:

1. Have you (has your child) ever had a problem with sneezing or a runny or blocked nose, when you DID NOT have a cold or the flu?
2. In the past 12 months, have you had a problem with sneezing or a runny or blocked nose, when you DID NOT have a cold or the flu?
3. In the past 12 months, has this nose problem been accompanied by itchy-watery eyes?
4. In which of the past 12 months did this nose problem occur? (Month names listed).

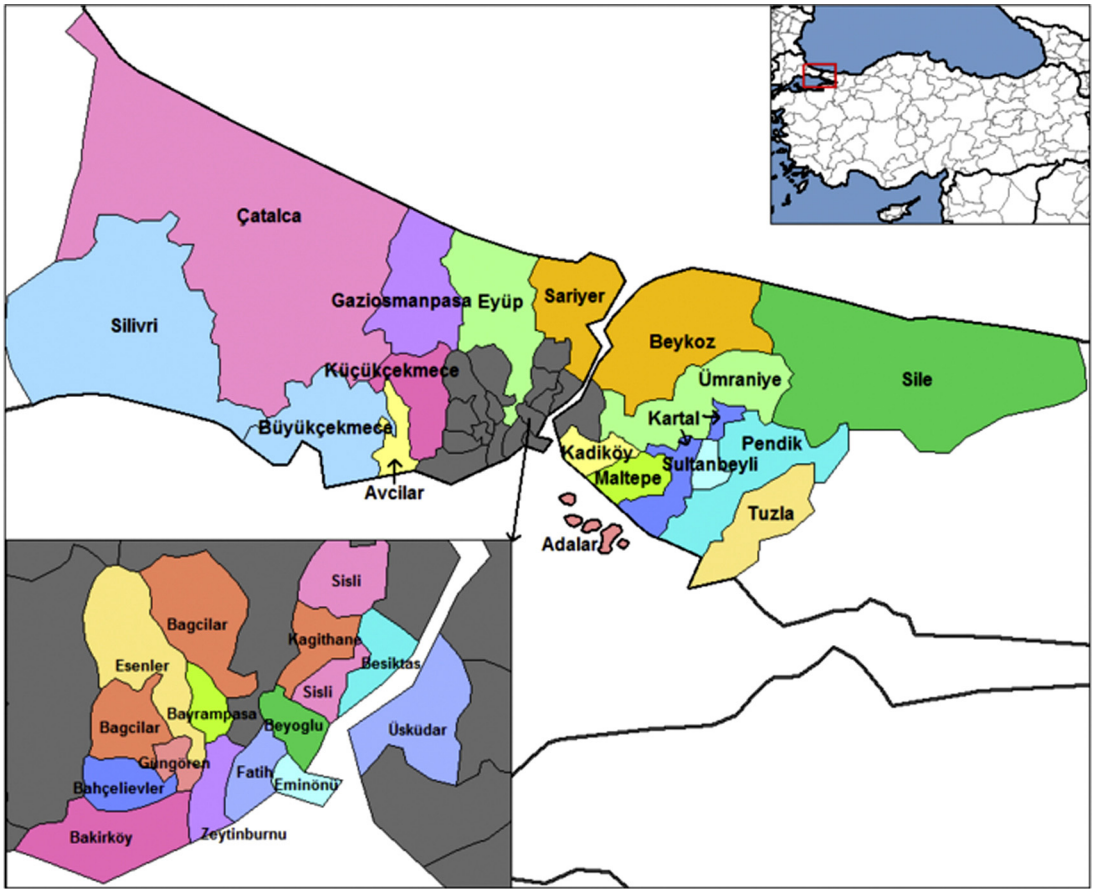

Fig. 1. Districts on Istanbul map and Istanbul on Turkey map.