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ORIGINAL ARTICLE

Risk factors affecting asthma prevalence in adolescents living in Istanbul, Turkey

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Abstract
Background: Asthma is one of the most important diseases of childhood. The aim of this study was to evaluate the prevalence of asthma symptoms and risk factors affecting asthma.
Methods: In a cross-sectional study design, 9991 children, aged 13–14 years in 61 primary schools in 32 districts of Istanbul were evaluated. Asthma prevalence among the children was assessed using the ISAAC protocol.
Results: In our study, a total of 10,894 questionnaires were distributed to 13–14 years old children, and of these 9991 questionnaires were suitable for analysis with an overall response rate of 91.7%. The rates of wheeze ever, wheezing in last 12 months and lifetime doctor diagnosed asthma prevalence were 17.4%, 9.0%, and 11.8%, respectively. There were 4746 boys (47.9%) and 5166 girls (52.1%) with M/F ratio of 0.92. Atopic family history, fewer than three siblings living at home, tonsillectomy or adenoidectomy history, consumption of fermented foods, mixed pickles, margarine and meat were found to be associated with an increased asthma risk. Use of paracetamol in the last 12 months, consumption of fruit and animal fats acted as a protective factor against asthma. The Mediterranean-style diet was not associated with the prevalence of asthma.
Conclusions: Lifetime doctor diagnosed asthma prevalence was found to be 11.8% in 13–14 year olds. History of tonsillectomy and/or adenoidectomy and consumption of fermented foods, mixed pickles, margarine and meat may increase the symptoms of asthma. Usage of paracetamol and consumption of animal fats may be investigated as a protective factor against asthma.

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Introduction

Asthma is one of the most important diseases of childhood in developed countries. ISAAC, the International Study of Asthma and Allergies in Childhood, was founded to maximise the value of epidemiological research into asthma and allergic disease by establishing a standardised methodology and facilitating international collaboration.[1,2]

Diet is a relatively recently recognised potential risk factor for asthma. Some authors reported that there is an inverse relationship between the intake of citrus fruit,[3] vegetables,[4] apples and pears[5] and the prevalence of asthma. Fish and fish products have also been associated with a lower prevalence of asthma.[3,4,6,7] Increased consumption of linoleic acid, found in polyunsaturated fatty acids (PUFAs), is thought to be linked to asthma, eczema and allergic rhinitis[8] because increased intake of linoleic acid leads to an increase in the synthesis of prostaglandin-E2 (PGE2), resulting in allergic sensitisation.[9]

The term ''Mediterranean diet'' 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 saturated fats; a high consumption rate of vegetables, fruits, pulses and grains; and moderate consumption of milk and dairy products.[10] Results about the effect of the Mediterranean diet on the prevalence of asthma are conflicting.

There are not enough data showing the prevalence rate of asthma among 13–14 years old school children covering all districts in Istanbul. The aim of this study was to evaluate the prevalence of asthma symptoms using the ISAAC questionnaire, to investigate risk factors including dietary habits affecting asthma among 13–14 years old schoolchildren in all districts of Istanbul.

Materials and methods

Study area

Istanbul is the biggest metropolis, being home to 13.5 million people; and one of the greatest business and cultural centres of Turkey. The city population consists of 1/7 of Turkey's population and its surface area is 11,868 km^2.[11] It has 32 districts.

Study population and design

The number of primary school children attending Grade 8 was 181,271 in Istanbul. Of those children, 5% from each district were planned to include in the survey. The number of schools and children were calculated according to the number of children attending Grade 8 in each district. According to this calculation, a total of 10,894 children aged 13–14 years in 61 randomly selected 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 years age group was chosen to give a reflection of the period when mortality from asthma is more common and to enable the use of a self-completed questionnaire. Questionnaires were distributed by teachers for self-completion. The study was conducted in Istanbul, between March 2004 and July 2005.

Questionnaire

The standardised core symptom questionnaire for 13–14 years olds was comprised of eight questions on symptoms relating to asthma.[1,2] These questions were as follows:

1. Have you ever had wheezing or whistling in the chest at any time in the past?
2. Have you had wheezing or whistling in the chest in the last 12 months?
3. How many attacks of wheezing have you had in the last 12 months? (None, 1–3, 4–12, more than 12)
4. In the last 12 months, how often, on average, has your sleep been disturbed due to wheezing? (Never woken with wheezing, less than one night per week, one or more nights per week)
5. In the last 12 months, has wheezing ever been severe enough to limit your speech to only one or two words at a time between breaths?
6. Have you ever had asthma with doctor's confirmation (spastic bronchitis, allergic bronchitis)?
7. In the last 12 months, has your chest sounded wheezy during or after exercise?
8. In the last 12 months, have you had a dry cough at night, apart from a cough associated with a cold or chest infection?

Question 1 was used to estimate the prevalence of wheeze ever, question 2 was used to estimate the prevalence of wheeze in last 12 months, question 3 was used to estimate the prevalence of number of wheeze attacks in last 12 months, question 4 was used to estimate the prevalence of sleep disturbed by wheeze in last 12 months, question 5 was used to estimate the prevalence of wheeze limiting speech in last 12 months, question 6 was used to estimate the prevalence of lifetime doctor diagnosed asthma, question 7 was used to estimate the prevalence of wheeze after exercise in last 12 months and question 8 was used to estimate the prevalence of waking with cough in last 12 months.

The questionnaire was translated into Turkish and used. As in the previous studies, the definition of asthma was accepted as self-reporting of diagnosed asthma with a physician's confirmation.[12,13] In general, doctors used the terms ''allergic bronchitis'' or ''spastic bronchitis'' instead of asthma.[12,13] For this reason, both of these terms were accepted as asthma in evaluation. There have been many studies carried out in Turkey using the modified version of the ISAAC questionnaire.[12–15]

An additional questionnaire was prepared to identify demographic features and potential risk factors, including: sex, atopic family history, time television watched during a week, paracetamol use in last 12 months, number of siblings living at home, being born in Istanbul, living period in Istanbul, education level of child's mother and father, presence of domestic animals at home, keeping fish, cat, dog and bird at home during last 12 months, smoking of child's mother