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ORIGINAL ARTICLE

Incidence of allergic rhinitis in a cohort of young adults from 13–15 years old to 23–25 years old in Castellon (Spain)

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KEYWORDS
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Abstract
Background: The objective of this study was to estimate the incidence of Allergic Rhinitis (AR) in young adults and its risk or protective factors.
Methods: A population-based prospective cohort study was carried out in 2012. The cohort participated in the International Study of Asthma and Allergy in Childhood in Castellon in 1994 and 2002. A telephone survey was conducted using the same questionnaires. A new case of AR was defined as the participants free of the disease in 2002, who self-reported suffering from AR or taking medications for AR in the period 2002–2012.
Results: Of the 1805 schoolchildren in the cohort in 2002, 1435 young adults (23–25 years old) participated (follow-up 79.1%) in 2012; 743 were female and 692 male; their mean age was 24.9 ± 0.6 years. Two hundred new cases of AR occurred in 1259 participants free of the

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disease with an incidence of 17.3 per 1000 person−years, and the incidence increased from 2002 (RR = 1.42; 95% CI 1.15−1.75). The risk factors of AR adjusted by age and gender were sinusitis (RR = 1.77; 95% CI 1.16−2.68), atopic dermatitis (RR = 1.51; 95% CI 1.11−2.06) and constant exposure to truck traffic (RR = 1.88; 95% CI 1.12−3.17). For male participants, the risk factors were asthma, sinusitis and atopic dermatitis, and for females bronchitis was a risk factor and presence of older siblings a protective factor.

Conclusions: An increase in AR incidence was observed. Sinusitis, atopic dermatitis and constant exposure to truck traffic were the risk factors of the AR with some differences by gender.

Introduction

The prevalence of allergic rhinitis (AR) and its repercussion on the life and work of patients have been studied in Spain.[1–3] In the years 2002−2008, the prevalence of AR in the adult population, adolescents (13−14 years old) and schoolchildren (6−7 years old), was estimated as 21.5%, 11.1% and 9.3%, respectively. These data were obtained following different methodologies.[4–6] Others studies have also established the characteristics of Spanish adults and paediatric patients with AR.[7–9] However, AR could be underdiagnosed by as much as 48%.[4] While these data reflect the extent of AR in the Spanish population, few cohort studies have been conducted on the incidence of AR in the adult population and their risk factors.

The European Community Respiratory Health Study (ECRHS)[10] on adults from 22 to 44 years studied the risk factors of AR for all the European participants, including five centres in Spain (Albacete, Barcelona, Galdakao, Huelva and Oviedo). The AMICS birth cohorts from Barcelona and Menorca presented results of AR in the European Birth Cohort,[11] and the study by Tornador-Gaya et al. in Castellon,[12] was a prospective cohort study on schoolchildren who participated in the International Study of Asthma and other Allergies in Childhood (ISAAC) in 1994 and in 2002, where only the incidence of AR by gender was indicated.

The objective of this study was therefore to the follow up the cohort of schoolchildren in Castellon from 2002 (13−15 years old) to 2012 (23−25 years old) in order to estimate the incidence of AR and its risk factors and to compare it with the cohort study of the period 1994−2002.[12]

Patients and methods

A prospective population-based cohort study was carried out on the cohort of young adults who had participated in the phases I (6−7 years old) and III (13−15 years old) of the ISAAC in 1994 and 2002, respectively. The study was conducted from January to June 2012, the same period as in the previous studies. The same questionnaires of previous studies were used with some additional questions. The information was obtained through telephone interviews of participants carried out by health staff of the Public Health Centre. The questionnaire included items on asthma, eczema and allergic rhinitis following the ISAAC methodology. In addition, information about AR risk factors was based on specific questionnaires completed by the parents of participants in the phases I and III of the ISAAC study. The definition of AR was based on a positive self-reported response for one at least of the following questions:

- Have you ever had a nasal allergy including hay fever and rhinitis?
- Do you take any medication for allergic rhinitis?

Of the 1805 participants in the 2002 study, 1435 (79.5%) adolescents were followed up to 2012, with a loss of 370 (20.5%) adolescents. Of the 1435 participants with follow-up data, 1259 were free of AR in 2002.

Statistical analyses

The cumulative incidence of AR was estimated considering the new cases and the rest of participants and the persons-years of follow up of the cohort during 10 years. Chi^2 and Fisher tests were applied to compare qualitative variables and the Kruskal−Wallis test was conducted for quantitative variables. Poisson regression was used to obtain cumulative incidence rate of AR and relative risk (RR) with a 95% confidence interval (CI). Poisson regression models were used in the bivariate and multivariate analysis to study the relationship between AR and risk or protective factors. For the multivariate analyses, independent covariates associated with AR and an alpha value less than $p < 0.20$ were included in the model to arrive at a model in which all covariates had a significant association. The models were then adjusted by gender and age. No interactions were observed among significant variables and all models had a goodness of fit. The Stata® programme version 12 was used in the statistical analyses.

The Castellon General Hospital ethics committee approved the study and an informed consent was obtained from all participants.

Results

The follow-up rate from 2002 to 2012 was 79.5% (1435/1805) with 743 females and 692 males and their mean age was 24.9 ± 0.6 years. Some significant differences between the follow-up group and non-follow-up group are shown in

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