Allergol Immunopathol (Madr). 2012;40(6):346–351

Allergologia et immunopathologia

www.elsevier.es/ai

ORIGINAL ARTICLE

The association of month of birth with atopy in adult patients with asthma and rhinitis in Anatolia, Turkey

E. Kurt[a,*], K. Aksu[a], M. Keren[a], C.H. Goss[b]

[a] *Eskişehir Osmangazi University, Allergy Department, Eskişehir, Turkey*
[b] *University of Washington, Division of Pulmonary and Critical Care Medicine, Seattle, WA, USA*

Received 2 June 2011; accepted 1 September 2011
Available online 23 November 2011

KEYWORDS
Atopy;
Rhinitis;
Asthma;
Month of birth;
Sensitisation

Abstract
Background: Exposure to allergens in early life may predispose subjects to develop allergies and diseases related to allergic sensitisation.
Objective: To determine the association between month of birth and atopic sensitisation in adult Turkish patients with rhinitis and/or asthma using the diagnostic method of skin prick tests.
Methods: This prospective cross-sectional study included all adult patients who underwent skin prick testing with rhinitis and asthma from November 2009 to June 2010. Sensitisation was categorised as any sensitisation, pollen sensitisation, and house dust mite sensitisation. Multivariate logistic regression model was employed with the primary predictor being month of birth. Diagnosis (asthma, rhinitis and both), age, gender and family history of atopy were considered as potential confounders in the model. The associations were presented with both unadjusted and adjusted odds ratios (OR) and their 95% confidence interval (CI).
Results: A total of 616 subjects were evaluated. Three-hundred and forty-one subjects had sensitisation to allergens according to skin prick tests. Analyses showed that subjects born in September were less likely to have documented skin test positively with pollen sensitisation [0.27 (0.09–0.84), $p = 0.023$].
Conclusion: The results support the hypothesis that being born at the end of the pollen season may protect subjects from pollen sensitisation.

Introduction

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.

The first month of life is considered as vulnerable period in the development of atopic diseases. Earlier

* Corresponding author.
E-mail address: dremelkurt@yahoo.com (E. Kurt).

0301-0546/$ – see front matter © 2011 SEICAP. Published by Elsevier España, S.L. All rights reserved.
doi:10.1016/j.aller.2011.09.005

reports have demonstrated a positive association between sensitisation to pollens and month of birth during March–May and January–May.[1,2] Other studies have identified a trend towards an increased risk for subjects born in the grass pollen season (May–June) to develop grass pollen allergy in children.[3,4] Subjects born in the pollen season (March–April) have been shown to have increased risk of being sensitised to birch pollen.[3] Another study also supported an increased risk of developing allergic skin sensitisation for grass pollen in those patients born in February, May and June[4] and an association between allergic diseases such as hay fever and month of birth.[4] A protective effect has been reported for certain months of birth: September for allergic sensitisation; October for asthma; and November for hay fever.[4] There are less data on the association of birth date and allergic sensitisation in adult patients. One study reported that month of birth was associated with sensitisation to certain pollens in seasonal allergic rhinitis and asthmatic adult patients.[5]

The aim of the present study was to determine the association between month of birth and atopic sensitisation in adult Turkish patients with respiratory diseases (rhinitis and asthma) using the diagnostic method of skin prick tests. Turkey is located in both Asia and Europe, has coasts on the Mediterranean, Black Sea and the Aegean Sea. Generally, Turkey's subcontinental Mediterranean-type climate is home to diverse fauna and associated pollens. We hypothesised that the association between birth month and allergen sensitisation would be present in adults in this environment yet show a different seasonal pattern.

Methods

The study was a prospective cross-sectional study. All adult patients who underwent skin prick testing with rhinitis and/or asthma in our outpatient clinic from November 2009 to June 2010 who provided informed consent were included in the study.

Inclusion Criteria:

1- All patients with rhinitis and asthma who underwent skin prick test with inhalant allergens.
2- The patients for whom we have birth date.

Exclusion Criteria:

1- Skin prick tested patients for food allergy, drug allergy and bee allergy.
2- Patients with chronic systemic diseases causing malnutrition.
3- Patients with dermographism or any other skin disease which may affect skin prick test results.
4- Patients who were using antihistamines, antileukotrienes, antidepressants and systemic steroids which may affect the skin prick test results.
5- Active smokers

Asthma was diagnosed according to the definition of the American Thoracic Society.[6] Atopic asthma was defined as an asthma diagnosis with any sensitisation to skin prick test. Rhinitis patients were defined by documentation in the medical history of the following symptoms: nasal itching, rhinorrhea, sneezing, and nasal obstruction. The diagnosis of hay fever was made on the basis of seasonal characteristics of the rhinitis symptoms and sensitisation to pollens. Perennial allergic rhinitis (PAR) was defined as rhinitis diagnosis with perennial symptoms and sensitisation to allergens. Family history of any of the allergic diseases, including asthma, allergic rhinitis, eczema and atopic dermatitis in a first-degree relative was used to define atopic family history.

Skin prick test (SPT)

Skin prick tests were performed using a common panel including: *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, grass, tree and weed pollens and moulds (including A*lternaria*, *Cladosporium*, *Aspergillus*, *Penicillium*) allergen extracts (ALK, Spain). Positive and negative controls were histamine and phenolated glycerol saline, respectively. A mean wheal diameter of 3 mm or greater than that obtained with control solution was considered positive.

Ethical approval of the Eskişehir Osmangazi University Institutional Ethical Board was obtained and all patients gave informed consent for the study.

Statistical analysis

Descriptive statistics included frequencies, percent distributions, mean and standard deviation for normally distributed data (age). Comparisons of age between groups were made using the One-way Anova test and the Mann–Whitney *U* test. Between group comparisons for categorical variables were made using the Chi-square test. Multivariate logistic regression analysis was employed to assess the association between month of birth and skin sensitisation and allergic diseases. Sensitisation was categorised as any sensitisation, pollen sensitisation, or house dust mite sensitisation. The reference month was January. Diagnosis (asthma, rhinitis and both), age, gender (male was reference) and family history of atopy were considered as potential confounders and included in the regression model. We employed the Hosmer–Lemeshow test to assess goodness of fit of our final logistic regression model. The strength of the relationship of sensitisation and month of birth was evaluated by calculating adjusted odds ratios (OR) and their 95% Confidence Interval (CI) in respect to reference month. Age was analysed as a continuous covariate. All other variables were coded as dichotomous categorical covariates. A two-tailed *p* value of less than 0.05 was considered as statistically significant. The data were analysed with SPSS computer program for Windows, version 15.0.

Results

Six-hundred and sixteen subjects were enrolled in this study. The mean age was 39.3 ± 13.7 years [median 38 (range: 16–75)]. Four-hundred and twenty-eight subjects were females (69%) (mean age was 40.9 ± 13.7 years old) and 188 subjects were males (mean age was 35.5 ± 13.7 years old). Three-hundred and forty-one patients had allergic sensitisation according to skin prick test results (56%). One-hundred and sixty-seven patients had sensitisation to