

# Frequency of Allergic Rhinitis in School-age Children (7-18 Years) in Tehran

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## ABSTRACT

Allergic Rhinitis (AR) is one of the most common allergic disorders of childhood.

In order to determine the frequency of AR among school-age children, a cross-sectional study was performed.

One thousand, nine hundred and thirty-two children (931 boys and 1001 girls), aged 7-18 years, from 30 systematic randomly selected schools of Tehran, the capital of Iran, were investigated in this study. Screening was made on the basis of the questionnaire according to International Study of Asthma and Allergies in Childhood protocol. Diagnosis was confirmed by history and physical examination.

Four hundred and fifty-five (240 boys and 215 girls) out of 1932 screened children had AR (23.5%). Seasonal AR and perennial forms were detected in 329 and 126 cases, respectively. The symptoms of seasonal AR were noted at spring (68.7%), summer (15.8%), and fall and winter (15.5%). The total prevalence of asthma was 3.5% according to questionnaire, which was lower than the prevalence (7.2%) in the AR subjects. The prevalence of cutaneous allergy also was 35.8% in children with AR. The positive history of atopy (AR, asthma, or cutaneous allergy) in the first degree relatives was detected in 47.9% in AR cases. Moreover, the history of contact with animals was positive in 35.4% of cases with AR.

AR is common among school-age children in Tehran. Coincidence of AR with asthma or cutaneous allergy is significant. Family history of allergy and history of contact with animals and cockroaches are important risk factors in the incidence of AR.

**Key words:** Allergic Rhinitis, Asthma, Children, Prevalence

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## INTRODUCTION

Allergic Rhinitis (AR) is one of the most common allergic disorders of childhood which reaches its peak in late childhood and adolescence.<sup>1</sup> Many researchers have reported an incidence of 10-30% of the total

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population.<sup>2,3</sup> AR has many complications such as sinusitis, serous otitis media, malaise, headache, a decrease in the sense of smell, and hearing problems. These complications may cause school absenteeism and school dysfunction. Many of the patients with AR would suffer asthma late in life,<sup>4,5</sup> therefore in order to determine the prevalence of AR in Tehran school-age children, this study was performed.

### MATERIALS AND METHODS

This descriptive cross-sectional study was carried out in the year 2002. One thousand, nine hundred and thirty-two children (931 boys and 1001 girls), aged 7-18 years, from 30 systematic randomly selected schools of Tehran, the capital of Iran, were screened in this study. Screening was conducted on a design based on the questionnaire according to International Study of Asthma and Allergies in Childhood protocol.<sup>6</sup> Diagnosis was confirmed by history and physical examination. The ISAAC (International Study of Asthma and Allergy in Children) phase I, designed questionnaires were distributed to 1932 school children in Tehran to be completed by one of their parents. The questionnaire included questions to establish the following points: whether the child had ever been diagnosed as having eczema or asthma by a physician either during the last months or before; whether seasonal or perennial rhinoconjunctivitis or wheezing had been observed by the parents; the presence of pet animals at home; and presence of atopic family history. The presence of allergic symptoms in a first-degree relative was regarded as positive family history.

The sampling method in this study was systematic sampling by using the probability proportional to size technique.

### RESULTS

Among the total population, 455 cases (23.5%) suffered from AR. Mean age of the total population was 12.5 years and the same figure for the AR patients was 13.1 years. The prevalence of AR was 25.8% among boys and 21.5% among girls. Among the patients with AR, 240 cases (52.7%) were boys and 215 cases

(47.3%) were girls. The frequency of AR in young adults (15-18 years) was 28.73%, which was much higher than children with the age group of 10-14 years (23.28%) and age group of 7-9 years (16%) (Table 1).

Seasonal AR and perennial form were detected in 329 (72.3%) and 126 (27.7%) cases, respectively. In the seasonal group 226 (68.7%) had symptoms in spring, 52 (15.8%) in summer, and 51 (15.5%) in autumn or winter.

The prevalence of asthma was 3.5% (67 cases). This frequency was only according to questionnaire related to known cases of asthma. The prevalence of asthma among the patients with AR was 7.25% (33 cases).

The total prevalence of cutaneous allergy was 24.5% (475 cases) which was lower than the prevalence (35.8%, 163 cases) in children with AR.

Five hundred and sixty-seven cases (29.3%) had a positive history of atopy (asthma or cutaneous allergy or rhinitis) in first degree relatives (parents or siblings) and this history was observed in 218 cases (47.9%) in the AR patients.

Of the total population, 588 cases (30.4%) had a positive history of contact with pet animals or cockroaches at home. In addition, this history was positive in 161 cases (35.4%) of the patients with AR.

The symptoms of 455 patients with AR, in descending order of frequency, include: rhinorrhea, rhinitis, sneezing, eye itching, and nose itching (Table 2).

### DISCUSSION

The final outcome of relative prevalence of 23.5% was predictable compared with the results in other areas of the world, as many of the researchers have reported an incidence of 10-30% for AR.<sup>2</sup> In the reports released in the year 2003, relative prevalence of AR had been 20-40%.<sup>7</sup>

In the year 1978, prevalence of AR was reported 14.1% in Scotland and 20% in Southeast of England.<sup>8</sup> In one study in the United States in the year 1994, the prevalence of AR was reported 42% in 6 year-olds (physician diagnosed).<sup>9</sup>

In our study the prevalence of AR was 25.8% in boys and 21.5% in girls showing a higher incidence in

**Table 1.** Age distribution in investigated children and allergic rhinitis cases.

Age groups	Investigated children		Allergic rhinitis		Proportion of allergic to investigated children
	Number	Percent	Number	Percent	
7-9 years	406	21	65	14.29	16
10-14 years	889	46	207	45.49	23.28
15-18 years	637	33	183	40.22	28.73
Total	1932	100	455	100	23.55

**Table 2.** The frequency of symptoms in allergic rhinitis (n=455).

Symptoms	Frequency	Percent
Rhinorrhea	334	73.4
Rhinitis	304	66.8
Sneezing	287	63
Eye itching	244	53.6
Nose itching	207	45.5

boys compared with girls. This gender preponderance (boys outnumber the girls) in AR was significant. In a study conducted by Hagy et al in 1971, the prevalence of AR was reported to be higher in boys, which was confirmed in our study.<sup>10</sup> However, in a study in Sweden published in 1998, no significant difference was found between men and women in general population.<sup>8</sup>

In our study, the seasonal form of the rhinitis had a prevalence of 72.3% and this prevalence was 27.7% for the perennial form. In studies conducted in the United States in 1998, 60% of patients had seasonal or seasonal-perennial form of disease and 40% had perennial form. The seasonal-perennial form was assigned to patients with mild symptoms in all seasons with an exacerbation during a specific season.<sup>7</sup> In our study the seasonal-perennial form was assigned seasonal.

In this study among patients with AR, 7.2% suffered from asthma. Considering the fact that the total prevalence of asthma in our population was 3.5% and according to health statistics reported in 1998 in the United States, prevalence of asthma in children was 12.1%.<sup>11</sup> It seems that this lower prevalence of asthma in our study according to questionnaire is perhaps due an inaccurate diagnosis on the part of some colleagues or poor knowledge of patients regarding this conditions

The prevalence of cutaneous allergy in our study was 24.5% and among patients with rhinitis, it was 35.8%. In one study that was published in 2001 in Odense, prevalence of cutaneous allergy was reported to be 21.3%.<sup>12</sup>

In our study positive family history of atopy in first degree relatives was 47.9% in patients with AR and this history was positive in 29.3% of total population. Therefore it seems that family history is an important risk factor for AR and points to the genetic basis of this disease.

In this study skin test to determine the type of the allergen was not performed, but according to the fact that 68.7% of patients with seasonal form of AR were symptomatic in Spring, it seems that pollens of trees

could be common causes of AR in Tehran.

Although most of our patients with AR were receiving drug therapy prescribed by physicians had not been informed of the type of allergen, most of them with AR or asthma had a close contact with pets and cigarette smoke at home and they had not been given any precaution about preventing contact with these harmful factors. On the other hand, it seems that the number of asthmatic patients is noticeably higher than the figure we have found, which is probably due to lack of familiarity of physicians with diagnosis of asthma. This fact emphasizes the necessity for more extensive education regarding allergic disorders in universities by faculty members of immunology and allergy.

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