

Short communication

The natural course of allergic rhinitis during 12 years of follow-up

Danielsson J, Jessen M. The natural course of allergic rhinitis during 12 years of follow-up.

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As symptoms of allergic rhinitis are generally thought to disappear with increasing age, we decided to follow up our allergic rhinitis patients to ascertain whether their disease had regressed or progressed, and whether they had developed respiratory symptoms. At our department, between 1979 and 1982, allergic rhinitis was diagnosed in 108 patients. In 1993, 82 of the patients (40 women, 42 men; mean age 36 years), none of whom had received immunotherapy, answered a questionnaire concerning the status of their allergic rhinitis, and any development of the disease during the interim. Of the 82 patients, one was free of allergic symptoms and 39% had become better; symptoms were unchanged in 39% of cases, and worse in 21%. Six percent had suffered from asthma at presentation, 6% had developed asthma in the interim, and 34% reported other lower airways symptoms. Neither sex nor age at diagnosis was a determinant of the course of allergic rhinitis. Thus, in contrast to findings in other studies, the severity of allergic rhinitis seems to have increased among our patients.

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Most of the many studies on the incidence and prevalence of allergic rhinitis have shown prevalence to peak between 10 and 30 years of age, and to be greatest among young men (1). With increasing age, the difference between the sexes disappears. In 1966, Fry reported annual prevalence to be 4.6% among 10-year-old boys, decreasing to about 0.6% among 50-year-old men (2). Eaton reported the incidence of "hay fever" to have increased from 4.6% to 5.7% during the 5-year period, 1974–9 (3). Åberg found the prevalence of allergic rhinitis among Swedish conscripts to have increased from 4.4% to 8.4% during the 10-year period, 1971–81 (4). Fleming & Crombie found that the prevalence of asthma and hay fever in England and Wales had increased during a 10-year follow-up, expressed by patients consulting per 1000 population (5). The rate of consultation began to decrease for males after 15 years of age, and for women after 25 years of age. Recently published studies have shown the prevalence of allergic and nonallergic rhinitis to be about 30% (1). Reported prevalence and incidence figures

vary considerably from one country to another, probably due to real national differences in prevalence, but also due to differences in the investigation procedures.

Few studies have been based on long-term follow-up of the same patients. Fry questioned 77 persons aged 50 years and over who had suffered from "hay fever" in their youth, and for whom records were available, as to the persistence or cessation of symptoms (2). All but two had ceased to suffer symptoms, and in 68% of cases this had occurred between the ages of 30 and 50. Twenty-five years after Fry's report, in a follow-up study of college students previously diagnosed as having allergic rhinitis, Settiple et al. found 10.5% to have developed asthma, and 23.3% of previously healthy students to have developed hay fever (6).

We decided to follow up patients, diagnosed as having allergic rhinitis at our ENT department during the period, 1979–82, the main aims being to ascertain how many of them still suffered from allergic disease, and whether they had developed lower airways symptoms.

Material and methods

Initially, the series comprised 108 consecutive cases of allergic rhinitis, selected from the register of allergy patients consulting at the ENT department of Växjö Hospital (Sweden) during the period, 1979–82. At presentation, all 108 patients manifested typical symptoms of allergic rhinitis, and had positive skin prick test results. The patients underwent specific tests for hazel, birch, grass, mugwort, dog, cat, horse, house-dust mites, *Alternaria*, and *Cladosporium*. All patients answered a questionnaire. None of the patients had received immunotherapy.

In 1993, the patients were asked to answer a modification of the original questionnaire, and were offered an ENT examination. After one reminder, 93 patients (86%) responded. The non-responders were 14 patients (five women and nine men), and one patient who returned the questionnaire but did not wish to complete it. Eleven patients who had received immunotherapy at other hospitals in the interim were excluded, leaving 82 patients (40 women and 42 men, mean age 36 ± 9 years (SD), range 20–58 years) for inclusion in the present study.

Among these 82 patients, the mean age at onset of allergic rhinitis was 17 ± 10 years, and thus a mean of 19 years had elapsed between onset of symptoms and start of the present study. The mean duration of follow-up after the diagnosis of allergic rhinitis was 12 years. The validity and the reproducibility of the questionnaire results were estimated in 15 patients who underwent re-examination in 1993.

Of the 82 patients, 61 suffered from nasal pollinosis (e.g., hazel, birch, and grass), six patients from animal dander allergy, 11 from both pollinosis and animal dander allergy, and the remaining four from a combination of animal dander, pollen, and house-dust mite allergy.

The chi-square test was used for statistical analysis of the data.

Questionnaire

The questionnaire comprised 18 main items and was divided into three sections. The first section was devoted to current allergic symptoms in the nose (discharge, itching, obstruction, sneezing), eyes (secretion, itching, swelling), and the lower airways (coughing, productive coughing, wheezing, breathlessness, asthma). The patients were requested to indicate which year the symptoms first appeared.

The second section was devoted to changes in allergic symptoms during the interim – i.e., whether

the symptoms had become worse or better, or remained unchanged. On a visual analog scale (VAS) ranging from 0 (no symptoms) to 10 (extreme symptoms), the patients were asked to rate the severity of their allergic symptoms both currently (1993) and retrospectively at presentation (1979–82).

The third section concerned any symptoms occurring during the interim, the patients being asked to report any asthma or chronic bronchitis, and whether the diagnosis had been made by a physician. There were also questions about smoking habits and occupation.

Results

All but one (i.e., 99%) of the patients were still suffering from allergic rhinitis, the symptoms having become better in 32 (39%) of cases, worsened in 17 (21%), and remained unchanged in 32 (39%). The sex and age distribution is shown in Table 1. The patient who no longer complained of allergic rhinitis symptoms at follow-up still had a positive skin test result (for *Dermatophagoides*).

At follow-up, five patients were unable to rate their overall allergic symptoms on a VAS. For the remainder ($n=77$), the mean overall score had decreased from 5.7 in 1979–82 to 4.5 in 1993. Mean VAS scores had decreased from 6.2 to 2.8 in the improved subgroup and from 5.4 to 5.0 in the unchanged subgroup, and increased from 5.1 to 6.3 in the deteriorated subgroup.

Of the 61 patients with pollinosis, 41% had become better, 23% had become worse, and 36% had remained unchanged. Of the six patients with animal-dander allergy, one had become better and one worse, the remaining four patients reporting

Table 1. Age and sex distribution of patients, and development of allergic rhinitis

	Worse	Unchanged	Better	n
Age 20–29 years				
Women	2	2	5	9
Men	4	4	5	13
	6 (27%)	6 (27%)	10 (46%)	22
Age 30–39 years				
Women	5	7	6	18
Men	2	4	5	11
	7 (24%)	11 (38%)	11 (38%)	29
Age 40–58 years				
Women	4	4	5	13
Men	0	11	6	17
	4 (13%)	15 (50%)	11 (37%)	30
Total				
Women	11	13	16	40
Men	6	19	16	41
	17 (21%)	32 (39%)	32 (39%)	81

unchanged symptoms. Of the 11 patients with both pollinosis and animal-dander allergy, 50% had become better and 50% reported unchanged symptoms.

Of the 82 patients in 1993, 10 (12%) suffered from both allergic rhinitis and asthma – five who had had asthma at presentation, and five who had developed asthma in the interim (in four cases diagnosed by a physician and the fifth patient reporting such typical asthmatic symptoms as wheezing, coughing, and dyspnea). Of the series as a whole, 28 patients (34%) reported occasional lower airways symptoms such as wheezing, dyspnea, coughing, or chest tightness. One of these patients had had chronic bronchitis diagnosed by his regular physician. Of the series as a whole, 44 (54%) reported no symptoms from the lower airways.

Of the 20 patients (eight women and 12 men) who were smokers, 55% reported improvement in allergic symptoms, 20% deterioration, and 25% no change. There was no difference between this subgroup and the nonsmoker subgroup in age distribution or in the development of lower airway symptoms.

As for medical treatment, 72 (88%) of the patients had had local treatment – e.g., corticosteroid or cromoglycate nasal spray, or antihistamine or cromoglycate eye-drops. Twenty-two of these patients had also been treated with systemic steroid injections on at least one occasion.

The series was characterized by diversity of occupations, and we found no relationship between occupation and symptomatology. The validity and reproducibility of the questionnaire results were tested in 15 patients who underwent re-examination, findings which corresponded well with their questionnaire answers.

Discussion

Few studies of allergic rhinitis have been based on long-term follow-up. Montgomery Smith, who investigated the long-term effects of moving residence in students tested 15–25 years previously, found allergic symptoms to have diminished in 62% of those who had remained at the same location, and asthma and hay fever to be unchanged or worse in 38%, whereas 70–83% of those who had moved were better or much better concerning their allergy (7). Fry found only 3% of patients aged 50 years or more to be still suffering from allergic rhinitis (2). Broder et al., who studied 6563 residents of Tecumseh, Michigan, USA (1974), reported remission of allergic rhinitis in 5% of women and 10% of men at 5-year follow-up, remission being less common among women under

the age of 45 years than in other age groups or in men (8).

In a 23-year follow-up of college freshmen, Settiple et al. found new cases of asthma in 10.5% of those with a history of allergic rhinitis, as compared with 3.6% of those with no such history (6). In a Danish follow-up study of 4000 patients (of all age groups and both sexes) consulting in general practice, only about 10% were free from allergic symptoms after 8 years of observation (9).

In 1976, Viner & Jackman published a retrospective survey of 1271 patients diagnosed as having perennial rhinitis (10). They found that it is likely that by the age of 50 years or more the disease will have burned itself out. However, the skin prick test was positive in only 64% of 1064 patients. Most patients (54%) had a positive test against animals including house-dust mites and only 30% against pollen. Nearly all our patients were suffering from pollinosis, so it is difficult to compare the two studies.

In our study, 99% of the patients still suffered from allergic rhinitis at follow-up, only one patient being free of symptoms, a finding in contrast to those of other studies where most of the patients were reported to be free of symptoms at follow-up. However, it should be borne in mind that there are differences in the duration of follow-up between one study and another, as well as geographic and socioeconomic differences.

All our patients were investigated at the ENT department. Judging by their VAS ratings, their symptoms would appear to be moderate, though, naturally, the accuracy of the patients' retrospective ratings for severity at presentation is open to question. However, it is reasonable to suppose that only patients with moderate or severe symptoms would attend a hospital ENT clinic, those with mild symptoms probably consulting their GP instead. One of the problems in comparing different studies is the difficulty of determining the severity of the patients' allergic rhinitis in a group with mild symptoms and that in a group with severe symptoms.

Only five (6%) of our patients developed asthma, as compared to 10.5% in the study by Settiple et al., but almost 50% of our patients developed lower airway symptoms of some kind (6). It is reasonable to assume that some of the 28 patients with occasional lower airway symptoms have mild episodic asthma. The duration of follow-up was about twice as long in Settiple et al.'s study as in ours. The proportion of our patients who suffered from both asthma and hay fever was comparable to the figure of 12% found by Arsdell & Motulsky in a study of 5818 college students (1).

Linna et al. followed 40 children who had been hospitalized at less than 24 months of age for

treatment of generalized atopic dermatitis (12). Ten years later, allergic rhinitis was diagnosed in 78% and asthma in 53%. These values were higher than in earlier reports, and support our findings that allergic rhinitis was more serious.

Our study found no difference between the sexes in the development of allergic rhinitis, a finding in accord with those in the Danish study (9). Unlike others, we found the development of allergic rhinitis to be independent of age, though in many cases the symptoms had become more severe at follow-up (2, 9, 13). Thus, after a mean interval of 12 years since diagnosis, nearly all our patients were still suffering from allergic rhinitis, and the symptoms had become worse in 21% of cases.

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