

Nasal allergy in medical students

S. Ogino, M. Irifune, T. Harada, T. Matsunaga and M. Ishida

Dept. of O.R.L., Osaka University Medical School, Japan

SUMMARY

The incidence of nasal allergy in medical students was studied in our University from 1983 to 1987. Intradermal skin tests were performed using six allergens: house dust (HD), ragweed, Japanese cedar, orchard grass, candida and broncasma berna. 154 out of 471 students (32.7%) had symptoms indicative of nasal allergy. HD and Japanese cedar were the main allergens and their positive rates were 66.4% and 51.0%, respectively in symptomatic cases. However, 34.4% of asymptomatic students also showed positive reactions to HD and 19.6% to Japanese cedar. In nasal provocation tests, 53.8% of symptomatic students who reacted positively to HD skin test showed positive reactions, while even 34.8% of asymptomatic students also showed positive reactions. The same results were obtained for Japanese cedar. It seemed that some asymptomatic students who had positive reactions to skin tests have latent allergies. A long-term follow-up would be necessary for these cases.

Nasal allergy is one of the most common otolaryngological diseases in Japan. This disease occurs worldwide and has been markedly increasing in our country. It is thought that the prevalence of nasal allergy is approximately 10% in Japan. In this study we examined the prevalence of nasal allergy and the rate of positive reaction to intradermal skin tests in a group of medical students.

SUBJECTS AND METHODS

Medical students at Osaka University Medical School were examined from 1983 to 1987. All students were asked about nasal allergies and underwent skin tests. The questionnaire consisted of two parts. All subjects were asked about symptoms of nasal allergy (nose itch, sneezing, nasal discharge and nasal blockage). Atopic diseases in the students and their families were included in the history. On the basis of their replies the students were divided into two groups, a symptomatic group and an asymptomatic one. For the symptomatic group, a

Paper presented at the 12th Congress of the European Rhinologic Society including the VIIth I.S.I.A.N., Amsterdam (The Netherlands), June 1988.

supplement questionnaire included questions about the age of onset, the severity of symptoms, ocular symptoms (burning, watering and redness of eyes) and the time of year and the duration of the symptoms.

Skin tests were performed using six allergens: house dust (HD), ragweed (RW), Japanese cedar, orchard grass, candida (Torii, Japan) and broncasma berna (Swiss Serum and Vaccine Institute, Bern, Switzerland). All allergens were available commercially, and HD and all pollens were diluted to 1:1,000 wt/vol and candida to 1:10,000 wt/vol concentrations. A saline-negative control was applied but a histamine-positive control was not tested. 0.02 ml of allergen extract was injected intradermally, and a flare more than 20 mm in diameter which occurred 15 min after injection was diagnosed as a positive reaction.

Nasal Provocation Test (NPT) was performed for some cases who exhibited a positive skin reaction for each allergen. This test was carried out with the use of a paper disc (Torii, Japan) according to Okuda's method (1977). The small paper discs (3 mm) contained 250 μ g (dry weight) of individual allergen extracts. A control disc with saline was initially placed on the surface of the anterior part of the inferior turbinate on one side of the nose. If no reaction occurred within 5 min a disc with allergen was applied to the same area. Four nasal symptoms (itching, sneezing, secretion and blockage) were checked for 10 min. When more than two out of four symptoms occurred or worsened, the NPT reaction was diagnosed as positive.

Statistical differences in the data were determined using student's t-test and Chi square analysis. P-values less than 0.05 were considered significant.

RESULTS

471 students were examined. Most of them (92.3%) were male and their mean age was 25.3 years. Replies to the questionnaire indicated that 154 out of 471 students (32.7%) had symptoms indicative of nasal allergy. This ratio was not affected by subjects' sex. 85 out of the 154 symptomatic students (55.2%) showed perennial symptoms and the other 69 students (44.8%) showed seasonal symptoms.

Symptoms were graded into four degrees of severity: none, mild, moderate and severe. In the perennial group, approximately 80% of the students showed only none to mild symptoms. In the seasonal group, on the other hand, 63% of the cases showed mild or minimal symptoms, and 37% showed moderate or severe symptoms but no statistical difference was seen between these two groups ($p > 0.10$) (data not shown).

Incidence of ocular symptoms, such as burning, watering or redness of the eyes, was significantly different between the perennial and seasonal groups ($p < 0.01$). In the perennial group, only 24% of the cases complained of ocular symptoms accompanied by nasal attack. On the other hand, 74% of the seasonal cases complained of ocular symptoms.

Figure 1 shows the age of onset. The mean age was 12.2 years for the perennial group and 18.6 years for the seasonal group. In particular, the onset of the symptoms was before the age of 10 in approximately half of the perennial cases.

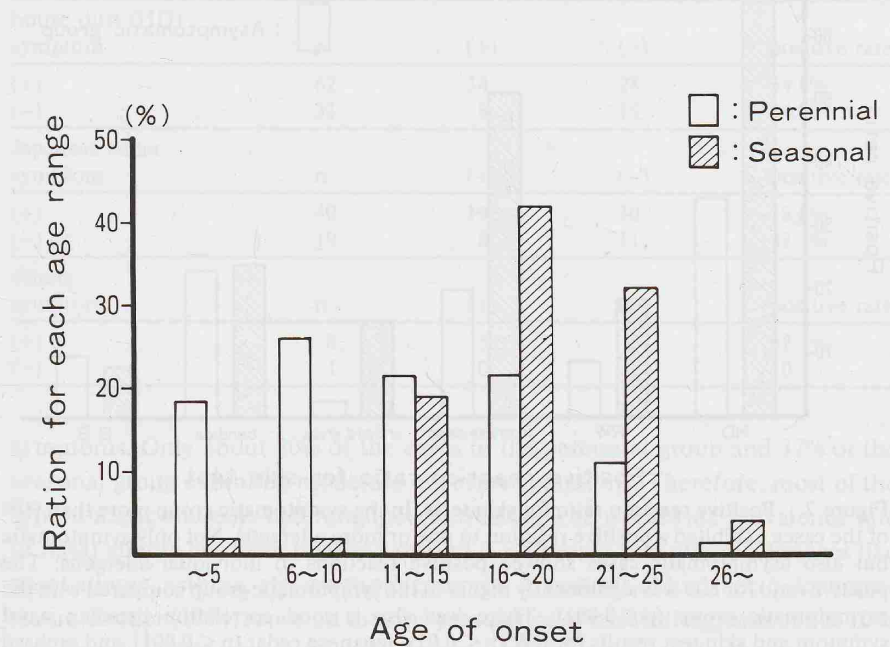


Figure 1. Age of onset in symptomatic students. The mean onset was 12.2 years for the perennial group and 18.6 years for the seasonal group. The onset of symptoms in seasonal cases therefore occurred later than in perennial cases.

96 out of 144 symptomatic students (66.7%) had atopic diseases in their family and/or past history, while only 30% of the asymptomatic cases had such a history ($p < 0.05$).

The positive reaction ratio for each skin test is shown in Figure 2. In the symptomatic group, more than 90% of the cases exhibited positive reactions to one or more allergens. 66.4% of the cases were positive to HD, 18.4% to RW, 51.0% to Japanese cedar, 14.9% to orchard grass, 24.0% to candida and 8.0% to BB. However, 34.4% of the asymptomatic students also showed a positive reaction to HD, 8.7% to RW, 19.6% to Japanese cedar, 2.4% to orchard grass, 22.6% to candida and 9.4% to BB. The positive ratio for HD was significantly higher in the symptomatic group compared with the asymptomatic group by the Chi square analysis ($p < 0.001$). There was also good correlation between nasal symptoms and skin test results for RW ($p < 0.01$), Japanese cedar ($p < 0.001$), and orchard grass ($p < 0.001$). With regard to candida and BB, there was no correlation between nasal symptoms and skin test results.

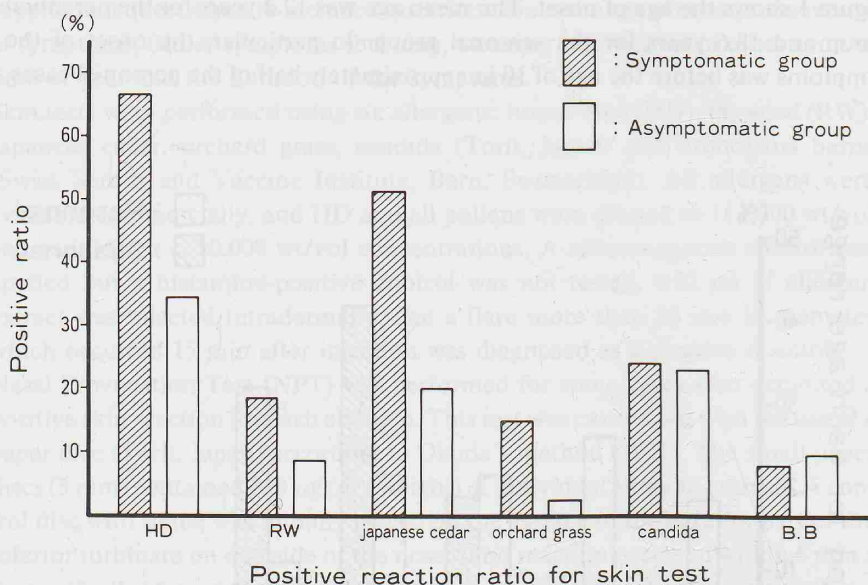


Figure 2. Positive reaction ratio for skin tests. In the symptomatic group more than 90% of the cases exhibited a positive reaction to one or more allergens. Not only symptomatic but also asymptomatic cases showed positive reactions to individual allergens. The positive ratio for HD was significantly higher in the symptomatic group compared with the asymptomatic group ($p < 0.001$). There was also a good correlation between nasal symptom and skin test results for RW ($p < 0.01$), Japanese cedar ($p < 0.001$), and orchard grass ($p < 0.001$). With regard to candida and BB, there was no correlation between nasal symptoms and skin test results. It was therefore difficult to determine by skin test whether candida and BB are real allergens for nasal allergy.

NPT was performed on cases who showed a positive reaction to the skin test with or without nasal symptoms (Table 1). For HD NPT, 34 out of 62 symptomatic students (54.8%) and 8 out of 23 asymptomatic students (34.8%) were positive. For Japanese cedar, 19 out of 49 symptomatic (38.8%) and 8 out of 19 asymptomatic students (42.1%) showed positive reaction. Other allergens included five of orchard grass and three of RW in the symptomatic group and one in the asymptomatic group. Five out of eight cases (62.5%) exhibited positive reactions in the symptomatic group.

DISCUSSION

Nasal allergy is a worldwide disease and has been markedly increasing in Japan. Recently this disease has become very common with a prevalence thought to be about 10% in our country. In this study, approximately 30% of the medical students at our university showed symptoms of nasal allergy. This prevalence rate was very high but most of the symptomatic cases showed mild or minimal

Table 1. Nasal provocation test (NPT) was performed with a paper disc containing allergen extract. "Others" means five of orchard grass, and three of RW in the symptomatic group, and one of RW in the asymptomatic group. In this study, NPT was not performed for skin test negative cases.

house dust (HD)				
symptom	n	(+)	(-)	positive rate
(+)	62	34	28	54.8%
(-)	23	8	15	34.8%
Japanese cedar				
symptom	n	(+)	(-)	positive rate
(+)	49	19	30	38.8%
(-)	19	8	11	42.1%
others				
symptom	n	(+)	(-)	positive rate
(+)	8	5	3	62.5%
(-)	1	0	1	0

symptoms. Only about 20% of the cases in the perennial group and 37% of the seasonal group exhibited moderate or severe symptoms. Therefore, most of the symptomatic students had remained untreated. The worldwide prevalence rate of nasal allergy has been reported on and it is thought that allergic diseases like nasal allergy, asthma, etc. are more common in persons of high socio-economic status. Broder (1974) reported that the prevalence of nasal allergy was about 10%, and Passali (1986) reported nasal allergy in 16% of children. He also mentioned that nasal allergy is a very common disease throughout the world.

For this study we used six allergens. Over 90% of nasal allergy patients in Japan have shown positive reaction to one or more of these six allergens. Therefore, it was thought that skin tests with these six allergens would be sufficient for a screening test. This is supported by studies by Herbert (1982), Pantin (1982), Eriksson (1987) who reported that skin tests with three or four allergens were enough for a screening test to detect allergy. HD and Japanese cedar are the main allergens in Japan and positive reaction rates for skin tests for these two allergens were 66.4% and 51.0%, respectively for symptomatic cases in our study. However, it is of interest that 34.4% of asymptomatic students also showed a positive reaction to HD and 19.6% to Japanese cedar. These asymptomatic students were considered to have latent allergies or show false positive reactions.

Almost the same interesting results were observed in NPT. NPT is considered the most reliable procedure for diagnosis of nasal allergy (Clement, 1979; Clarke, 1987) and there was a good correlation between NPT and skin test. On the other hand, Daele (1979) and Pelikan (1983) reported that, for HD, a good correlation between NPT and skin test could not be found, but these results might be due to heterogeneous and variable antigenicity in the HD solution. In this study, 53.8%

of the symptomatic students who had a positive reaction to HD showed positive NPT, while as much as 34.8% of the asymptomatic students also showed a positive reaction. We obtained the same results for Japanese cedar. It seemed, therefore, that some of the asymptomatic students who had positive reactions to skin tests have latent allergies and might develop nasal allergy in the near future. The literature gives evidence of similar, atypical findings.

When Townley (1975) examined bronchial sensitivity in asthmatic patients using metacholine, two out of 19 control subjects were observed to have increased bronchial sensitivity to metacholine. Galdes-Sebaladt (1985) also showed that bronchial responsiveness to metacholine increased in two out of 12 normal children. They called this phenomenon false positive or latent asthma. For a period of four years Horak (1985) examined 114 children who showed sensitivity to inhalant allergens without any sign of clinical manifestation. 53% of the children complained of nasal allergy symptoms within this period.

On the basis of our study, we concluded that long-term follow-up is necessary for the cases who showed sensitivity to some allergen(s) but no nasal symptoms.

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S. Ogino, M.D.
Dept. of O.R.L.
Osaka University Medical School
Fukushima-ku
Osaka (553)
Japan