

□ Brief Communication □

Prevalence of arthropod antibodies in Korean patients with allergic rhinitis

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Abstract: Arthropod antigens are main causative agents which induce allergic responses in humans. However, little information is known about the prevalence of specific arthropod allergens in Koreans with allergic diseases. The current study was designed to determine the positive rates of arthropod antibodies by the Korean inhalant panel of MAST-CLA. One hundred sixty patients, who were diagnosed with allergic rhinitis from an out-patient center at the Soonchunhyang University Chunan Hospital, were studied between August 1998 to July 2000. The overall positive rate, at least more than one specific antibody of arthropods such as *Dermatophagoides farinae* (Df), *Dermatophagoides pteronyssinus* (Dp), and cockroach mix (Cm), was 46.9%. Each positive rate of Df, Dp, and Cm was 45.0%, 43.1%, and 8.8%, respectively. A significant agreement among arthropod allergens was observed (Df and Dp: 95.6%, Kappa = 0.911, P < 0.001). Our data supported the fact that arthropods were the most common allergens in Korean patients with allergic rhinitis; however, the MAST-CLA should be modified to increase specificity of arthropod allergens.

Key words: arthropods, hypersensitivity, mites, cockroaches, allergic rhinitis

Recently, patients with allergic rhinitis have been gradually increasing in Korea. Allergic rhinitis is one of the most prevalent allergy-related diseases, and in Korea, the arthropod-related antigens have been the major cause of allergy (Cho et al., 1987; Lee et al., 1992). Although some of the diagnostic tools such as skin prick test and radioallergosorbent test (RAST) have widely been applied to identify allergens, there are still no definite diagnostic measures. In recent years, Multiple Antigen Simultaneous Test-chemiluminescent assay (MAST-CLA) (Miller et al., 1984; Brown et al.,

1985) has been adopted for its simplicity, comfortability, and safety; however, there still are some arguments about its specificity and sensitivity (Yang et al., 1998). This study was designed to determine the prevalence of arthropod allergens in patients with allergic rhinitis.

During October 1998 and July 2000, 160 patients, diagnosed clinically as allergic rhinitis, were enrolled and examined for the current study. *Dermatophagoides farinae* (Df), *Dermatophagoides pteronyssinus* (Dp), and cockroach mix (Cm) antibodies were examined using Korean inhalant panel of MAST® CLA® allergen-specific IgE assay (MAST Immunosystems, Mountain View, CA, USA). Their participation was voluntary and informed consent was given. The assay was performed as the manufacturer's instruction and the

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results above 2 positive levels were considered as specific. Each and the overall positive rates were calculated from a set of collected data using a Stata statistical program. Kappa indices were determined among arthropod allergens to compare with agreement of cross positivity, and $P < 0.05$ was considered to be statistically significant.

Distribution of study subjects by age and sex is presented to Table 1. Among 160 patients, male accounted for 55.6% and the mean (SD) age was 22.9 (13.4) years old. The overall positive rate, showing a positive reaction to at least more than one specific antibody of arthropod allergens such as Df, Dp, and Cm, was 46.9% (Table 2). Each positive rate of Df, Dp, and Cm was 45.0%, 43.1%, and 8.8%, respectively. Among the arthropod allergens in MAST-CLA, significant agreements were observed and the highest agreement was between Df and Dp (95.6%, $P < 0.001$) (Table 3).

As the above results, the Korean inhalant panel of MAST-CLA found out 46.9% of allergic rhinitis patients sensitized to arthropod allergens. One of the recent studies carried out in Japan, also using MAST-CLA, showed the positive rates of Df and Dp to be 31% and 30% in allergic rhinitis patients (Ogino et al., 1993).

Table 1. Distribution of study subjects by age and sex

| Age | Sex | | Total (%) |
|-------|-----------|------------|-----------|
| | Male (%) | Female (%) | |
| -9 | 23 (25.8) | 8 (11.3) | 31 (19.4) |
| 10-19 | 26 (29.2) | 20 (28.2) | 46 (28.8) |
| 20-29 | 11 (12.4) | 13 (18.3) | 24 (15.0) |
| 30-39 | 19 (21.4) | 22 (31.0) | 41 (25.6) |
| 40- | 10 (11.2) | 8 (11.3) | 18 (11.3) |
| Total | 89 (100) | 71 (100) | 160 (100) |

Table 2. Positive rates to arthropod allergens in Korean inhalant panel of MAST-CLA

| Panel No. | Allergen | N (%) |
|-----------|--|-----------|
| 22 | Cockroach mix (Cm) | 14 (8.8) |
| 25 | <i>Dermatophagoides farinae</i> (Df) | 72 (45.0) |
| 26 | <i>Dermatophagoides pteronyssinus</i> (Dp) | 69 (43.1) |
| | No. of positives in arthropod allergens | 75 (46.9) |

Our study showed significant agreement of positive rates among arthropod allergens, especially between Df and Dp. This can be explained that the group I and group II antigens of Df and Dp are the most common allergens world wide, and each allergen group has almost the same structures, functions, and antigenic epitopes (Heymann et al., 1986, 1989).

This study showed a high prevalence rate of arthropod antibodies. Therefore, it is recommended that more detailed and controlled studies are required to determine other causative arthropod allergens in Koreans.

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Table 3. Agreement of positives among arthropod allergens

| Allergen | Kappa | Agreement (%) | P-value |
|----------|-------|---------------|---------|
| Df : Dp | 0.911 | 95.6 | < 0.001 |
| Df : Cm | 0.128 | 60.0 | 0.004 |
| Dp : Cm | 0.140 | 61.9 | 0.003 |

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