Analysis of 10 Environmental Allergen Components of the American Cockroach in Taiwan

Mey-Fann Lee, Yi-Hsing Chen, Chu-Hui Chiang, Shyh-Jye Lin, Pei-Pong Song, MSc
E-mail: chchiang@mail.dyu.edu.tw

ABSTRACT

Background: Cockroaches are important sources of indoor airborne allergens. The American cockroach (Periplaneta americana) is the second leading inhalant allergen causing allergic airway diseases in Taiwan. We previously reported a difference in pathogenicity of different allergen components from American cockroaches.

Objective: To analyze the environmental profile of American cockroach allergen components.

Methods: Polyclonal antibodies were generated to recombinant American cockroach allergens, Per a 1 through Per a 10. The levels of each allergen in (1) whole-body extracts and feces from American cockroaches and in (2) fresh-frozen 6-month-old and 12-month-old dead American cockroaches were evaluated by immunoblotting and quantified. Levels of allergen components from patients' household dust samples were determined by competition enzyme-linked immunosorbent assay.

Results: Per a 1, 2, and 10 proteins were present predominantly in roach feces, whereas other allergen components were found predominantly in roach bodies. There was a time-dependent decrease in total levels of some allergen proteins. Although levels of Per a 4, 5, 6, and 9 significantly decreased to less than 20% of the basal level, there was no significant change in levels of Per a 2, 7, and 10 after 1-year decomposition. The most abundant allergen components in 20 dust samples from patients' houses were Per a 9, Per a 10, and Per a 2.

Conclusion: The concentration of 10 American cockroach allergen components differed in the environment. Per a 2 and Per a 10 can be used as markers.

Keywords: Allergen, American cockroach, immunoblotting

REFERENCES

[6] Lan JL, Lee DT, Wu CH, Chang CP, Yeh CL. Cockroach hypersensitivity: preliminary study of allergic cockroach asthma in...