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The IgE responses to shrimp are caused by the dust mite allergen-Der p 10 in vegetarians

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Tropomyosin was found to be responsible for the cross-reactivity between shrimp and dust mite, and measurement of tropomyosin specific IgE was reported superior to shrimp for predicting clinically allergic reaction. The aim of this study is to identify the cross-reactivity of tropomyosin among shrimp-Pen m 1 and dust mite-Der p 10. A total of 120 subjects were enrolled in this study: 60 children (<18 yr), 30 middle-age adults (18-65 yr) and 30 elderly adult (>65 yr). In the group of middle-age adult, there were four non-shrimp exposure vegetarians recruited for further analysis. The specific IgE for shrimps and house dust mites were measured using automated microfluidic-based immunoassay system (BioIC[®]) diagnostic assay. Two recombinant allergens of dust mite (rDer p10) and shrimp (rPen m1) were generated to investigate their cross-reactivity. The cross-reactivity between shrimps and mites were determined by basophil histamine release (BHR) before and after allergen absorption. The results showed that there were more children sensitive to mite (91.7%) than to shrimp (28.3%). In the group of middle-age adult, the mite sensitivity rate was decreased to 56.6% and shrimp sensitivity rate increased to 73.3%. In the elderly adult, the mite sensitivity rate was decreased down to 46.6%, however the shrimp sensitivity remained constant (73.3%). The rates of cosensitivity to shrimp and mite were 26.6% in children group, 56.6% in middle-age adult group and 43% in elderly adult group. A total of 45 subjects who sensitized to both shrimp and mite were recruited for BHR assay. Similar results were observed in the BHR assay, the content of histamine stimulated by mites (69.3%) was significantly higher than shrimp (48.4%) in the children group. Converse results were showed in the elderly adult group, shrimp-stimulated BHR (61.0%) was significantly higher than mite (44.5%). In the inhibition BHR assay, the results showed the shrimp-stimulated BHR could be decreased significantly by absorption with Der p 10 in the children group. The mite-stimulated BHR could be absorbed significantly with Pen m1 in the elderly adult group. In the inhibition assay of Western blot and BHR, the positive IgE responses to shrimp could be absorbed by Der p10 from vegetarians' sera. It indicated that the IgE positive response to shrimp of the vegetarians was originated from the cross-reactivity of tropomyosin from the dust mite-Der p10.

Biography

En-Chih Liao is an Assistant Professor in Mackay Medical College, New Taipei City, Taiwan. His major degree is PhD from National Yang-Ming University, Institute of Clinical Medicine, Taipei, Taiwan. His specialty is in fields of Microbiology, Basic and Clinical Immunology, Tropical Medicine, and Translation Medicine. His research interest focuses on the house dust mite allergen characterization, animal model of bronchial asthma, and biomedical wafer of diagnostic development. Special honors for him are 2011 Seoul International Invention Fair (SIIF) (Gold Prize), (Russian House Award) and 2014, 11th National Innovation Award.

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