

Sensitization Patterns in Children with Diverse Allergic Diseases: Findings from Chiba High Risk Birth Cohort for Allergy (CHIBA) Study

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Background and Objective

Allergic sensitization is one of strong risk factors for the development of allergic diseases. Since environmental factors as well as genetic factors are different among countries, we thought it is necessary and important to set and run birth cohorts in Japan. Here we report prevalence of allergic diseases and sensitization to major allergens in Japanese children with family history of atopy at 1,2,5 and 7 years. We also tried to identify factors related to allergen sensitization by examining biospecimen obtained in the cohort.

Subjects and Method

CHIBA (Chiba High risk Birth cohort for Allergy) study is a longitudinal birth cohort study of 269 infants with family history of atopy in Chiba city, Japan to examine the relationship of genetic and environmental factors to the subsequent development of atopic/allergic diseases in childhood. At 1,2,5 and 7 years of age children were examined by pediatrician and otolaryngologist with detailed information about allergic diseases from caregivers. Specific IgE antibodies to egg white, ovomucoid, cow's milk, *Dermatophagoides farinae* (Df), Japanese cedar pollen (JCP) were measured by ImmunoCAP®.

Results

Numbers of children examined were 267, 256, 205 and 181 at each time points. Prevalence of atopic dermatitis (AD) (including suspected cases) was 15.2%, 19.1%, 24.9% and 21.5%, respectively. Prevalence of food allergy (FA) was 7.9%, 7.8%, 5.9% and 6.1%, respectively. Prevalence of bronchial asthma (BA) was 1.9%, 6.6%, 15.1% and 12.2%, respectively. Prevalence of perennial allergic rhinitis (PAR) was 2.1%, 5.7%, 25.3% and 33.0%, respectively. Prevalence of Japanese cedar pollinosis were 5.3% at 5Y and 32.4% at 7Y. Sensitization (class 2 and more viz. 0.7 UA/mL and more) to egg white, ovomucoid, cow's milk, Df and JCP at 1Y were 33.2%, 11.8%, 13.1%, 6.7% and 0%, respectively. Sensitization to the allergens at 2Y were 30.7%, 11.7%, 18.7%, 31.1% and 3.5%, respectively. Sensitization to the allergens at 5Y were 20.4%, 11.2%, 10.7%, 51.0% and 44.4%, respectively. Sensitization to the allergens at 7Y were 10.3%, 6.9%, 8.0%, 56.6% and 53.7%, respectively.

Summary and Discussion

Sensitization to egg white in early infancy is common in children with family history of allergy in Japan. The order of sensitization in children was interesting; as to food allergen, egg white is the earliest sensitizing allergen followed by cow's milk, as to airborne allergen sensitization to Df starts before 2 years of age and JCP sensitization follows. It is necessary to prove whether or not intervention in the early infancy such as radical treatment of AD stops progression in sensitization to major allergens as well as allergic march. (We found several factors related to allergen sensitization. If time is available I would like to mention them.)