World Academy of Science, Engineering and Technology
International Journal of Biological and Ecological Engineering
Vol:9, No:02, 2015

Association of 105A/C IL-18 Gene Single Nucleotide Polymorphism with House Dust Mite Allergy in an Atopic Filipino Population

Authors : Eisha Vienna M. Fernandez, Cristan Q. Cabanilla, Hiyasmin Lim, John Donnie A. Ramos

Abstract : Allergy is a multifactorial disease affecting a significant proportion of the population. It is developed through the interaction of allergens and the presence of certain polymorphisms in various susceptibility genes. In this study, the correlation of the 105A/C single nucleotide polymorphism (SNP) of the IL-18 gene and house dust mite-specific IgE among Filipino allergic and non-allergic population was investigated. Atopic status was defined by serum total IgE concentration of ≥100 IU/mL, while house dust mite allergy was defined by specific IgE value ≥ +1SD of IgE of nonatopic participants. Two hundred twenty match-paired Filipino cases and controls aged 6-60 were the subjects of this investigation. The level of total IgE and Specific IgE were measured using Enzyme-Linked Immunosorbent Assay (ELISA) while Polymerase Chain Reaction – Restriction Fragment Length Polymorphism (PCR-RFLP) analysis was used in the SNP detection. Sensitization profiles of the allergic patients revealed that 97.3% were sensitized to Blomia tropicalis, 40.0% to Dermatophagoides farinae, and 29.1% to Dermatophagoides pteronyssinus. Multiple sensitization to HDMs was also observed among the 47.27% of the atopic participants. Any of the allergy classes of the atopic triad were exhibited by the cases (allergic asthma: 48.18%; allergic rhinitis: 62.73%; atopic dermatitis: 19.09%), and two or all of these atopic states are concurrently occurring in 26.36% of the cases. A greater proportion of the atopic participants with allergic asthma and allergic rhinitis were sensitized to D. farinae, and D. pteronyssinus, while more of those with atopic dermatitis were sensitized to D. pteronyssinus than D. farinae. Results show that there is overrepresentation of the allele “A” of the 105A/C IL-18 gene SNP in both cases and control groups of the population. The genotype that predominate the population is the heterozygous “AC”, followed by the homozygous wild “AA”, and the homozygous variant “CC” being the least. The study confirmed a positive association between serum specific IgE against B. tropicalis and D. pteronyssinus and the allele “C” (Bt P=0.021, Dp P=0.027) and “AC” (Bt P=0.003, Dp P=0.026) genotype. Findings also revealed that the genotypes “AA” (OR:1.217; 95% CI: 0.701-2.113) and “CC” (OR, 3.5; 95% CI: 0.727-16.849) increase the risk of developing allergy. This indicates that the 105A/C IL-18 gene SNP is a candidate genetic marker for HDM allergy among Filipino patients.

Keywords : house dust mite allergy, interleukin-18 (IL-18), single nucleotide polymorphism,
Conference Title : ICBMB 2015 : International Conference on Bioinformatics and Molecular Biology
Conference Location : Paris, France
Conference Dates : February 23-24, 2015