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Asthma, allergy and polymorphisms in vitamin D pathway: A cross section study

Alana Alcântara Galvão¹, Emília Maria M de Andrade Belitardo¹, Flávia de Araújo Sena¹, Juliana Mendonça dos Santos¹, Ryan dos Santos Costa¹, Camila Alexandrina Viana de Figueirêdo, Maurício Lima Barreto² and Neuza Maria Alcântara Neves¹

 $^2\mbox{Gonçalo}$ Moniz Institute - FIOCRUZ Bahia, Brazil

Introduction: Vitamin D presents a highlighted immune system activity. Its deficiency or insufficiency has been associated with low asthma control. Also, genetic determinants on the vitamin D pathway have been associated with asthma. In this study, we investigated associations between vitamin D serum levels with atopy and asthma, as well as polymorphism genes of the vitamin D pathway.

Methods: 25 (OH) vitamin D quantified from 970 of 11-17 years old Brazilians by ELISA. Asthma diagnosis was obtained by ISAAC, Phase III questionnaires. Specific IgE detection to allergens was performed by ImmunoCAP; DNA was extracted and genotyped using 2.5 Human Omni Biochip from Illumina. Statistical analyses were performed using PLINK 1.9 and SPSS 22.1 programs.

Results: The prevalence of vitamin D insufficiency was 64% in 76 asthmatic and 62.5% in 446 atopic individuals; however there was no significant association between vitamin D and this outcomes. Negative correlation was found between vitamin D and specific IgE levels to *Dermatophagoides pteronyssinus* on atopic subjects (r=-0.11, p=0.04). Genetic variants in *CYP2R1* gene, rs7935792 (C allele) (Beta 1.66; 95% CI 0.20-3.11) and rs7129781 (C allele) (Beta 1.55; 95% CI 0.07-2.96), were associated with vitamin D serum levels. In addition, the same variants had suggestive protection on asthma, but it was not significant (OR 0.74; 95% CI 0.39; 1.39; OR 0.73; 95% CI 0.38; 1.37, respectively). VDR variants rs7965397 (G allele) was positively associated with atopy (OR 1.43; 95% CI, 1.07-1.92); rs4328262 (G allele) (OR 1.44; 95% CI 1.09-1.90) and asthma rs2408876 (C allele) (OR 2.31; 95% CI; 1.18-4.53); rs2238317 (T allele) (OR 2.19; 95% CI 1.02-4.72).

Conclusions: Vitamin D can modulate the immune system and reduce allergic biomarkers. Genetic variants in *CYP2R1* regulated vitamin D levels, and must prevent asthma symptoms. Genetic variants in VDR were associated with asthma and atopy susceptibility may be by modifying VDR expression.

Biography

Alana Alcântara Galvão has completed her graduation in Pharmacy, Master's in interactive processes of the organs and systems by the Federal University of Bahia (UFBA) and currently is a PhD student of Immunology at UFBA. She is actually working in Laboratory of Allergy and Acarology (LAA). Her research covers immunoepidemiology, immunomodulation and immunogenetics. She collaborated with projects like: Research on the prevalence of respiratory allergies and their risk factors in children from rural areas in the city of São Francisco do Conde, Bahia (2010); An asthma cohort in children and adolescents of the city of Salvador - Bahia, SCAALA (Social Change in Asthma and Allergy in Latin America) (2012); Immunogenetic study on possible associations between Vitamin D, atopy and asthma in children and adolescents of Salvador, Bahia (2014). The objective of her study is to identify the association of vitamin D with asthma and atopy, highlighting genetic variants in vitamin D pathway.

alana_alcantara@hotmail.com

Notes:

¹Federal University of Bahia (UFBA), Brazil