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2nd International Conference on
Pharma & Nutrition, Health and Aging

August 1-2, 2019 Valencia, Spain

AGXT2 and DDAH-1 Genetic Variants are Highly Correlated with Serum ADMA and SDMA Levels and with Incidence of Coronary Artery Disease in Egyptians

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Background: Dimethylarginine aminodehydrolase (DDAH1) and alanine glyoxylate aminotransferase2 (AGXT2) are two enzymes that contribute in asymmetric dimethylarginine (ADMA) and symmetric dimethylarginine (SDMA) metabolism. Hence they affect production and bioavailability of eNOS-derived nitric oxide (NO) and consequently healthy blood vessels. The major aims of the current study were to investigate the association of genetic variants of AGXT2 rs37369, AGXT2 rs16899974 and DDAH1 rs997251 SNPs with incidence of coronary artery disease (CAD) in Egyptians and to correlate these variants with the serum levels of ADMA and SDMA.

Methods: The study included 150 subjects; 100 CAD patients and 50 healthy controls. Genotyping was performed by qPCR while the ADMA and SDMA concentrations were assayed by ELISA.

Results: Both serum ADMA and SDMA concentrations were significantly higher in CAD patients compared to controls (both $p<0.0001$). Genotype distributions for all studied SNPs were significantly different between CAD patients and controls. Carriers of AGXT2 rs37369-T allele (CT+TT genotypes) and AGXT2 rs16899974-A allele (CA+AA genotypes) had 2.4 and 2.08 fold higher risk of having CAD than CC genotype in both SNPs ($p = 0.0050$ and 0.0192, respectively). DDAH1 rs997251 TC+CC genotypes were associated with 2.3 fold higher risk of CAD than TT genotype ($p= 0.0063$). Moreover, the AGXT2 rs37369 TT and AGXT2 rs16899974 AA genotypes were associated with the highest serum ADMA and SDMA while DDAH1 rs997251 CC genotype was associated with the highest ADMA.

Conclusion: AGXT2 rs37369-T, AGXT2 rs16899974-A and DDAH1 rs997251-C alleles represent independent risk factors for CAD in the Egyptians.

Biography:

Sally Ibrahim Hassainein is earned bachelor degree in pharmacy from Pharmacy, Cairo University, 1998. Then she worked as a Teacher Assistant in Biochemistry Department at the Misr International University, Egypt. She earned master's level 2005-2006 and PhD degree, genetic polymorphisms, 2007-2010, German University Cairo (GUC). A part of PhD practical part, she earned DAAD short term stay scholarship DAAD in 2008, short at the University Medical Center Hamburg-Eppendorf (UKE) (German). Since 2011, present as a research fellow, Genetic polymorphisms in cardiovascular disease and vitamin D.