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TLR-4, CD14 polymorphisms and plasma concentration of soluble CD14: Is there a genetic link with coronary artery disease?

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Background: Inflammatory mechanisms have a key role in the pathogenesis of atherosclerosis. The most frequent functional polymorphisms of TLR-4- Asp299Gly and Thr399Ile- and of CD14 promoter area-C260T polymorphism-are studied in patients with coronary atheromatosis. Plasma levels of soluble CD14 are checked for possible correlation with the severity of coronary artery disease (CAD).

Methods: DNA was obtained from 100 human paraffin-embedded aortic specimens, from cadavers with known coronary atheromatosis (Group A) and 100 blood samples from patients with CAD, as detected by cardiac multi-detector-row-computed-tomography (MDCT) (Group B). Our control group consisted of 100 healthy individuals (Group C). Genotyping was performed by restriction fragment length polymorphism-polymerase chain reaction (RFLP-PCR). Plasma levels of sCD14 were measured with ELISA.

Results: For TLR-4 Asp299Gly and Thr399Ile polymorphisms, no statistically significant differences were observed. Regarding the C260T polymorphism, frequencies of T allele were significantly higher in the control group compared to the case group ($p=0.05$). The odds ratio (OR) showed statistically significant association of TT genotype with healthy individuals (OR= 0.25, 95% confidence interval (CI) =0.10–0.62, $p=0.0017$). Plasma levels of sCD14 in patients with CAD (mean value=1.35 $\mu\text{g/ml}$) were reduced when compared to reference value.

Conclusions: The studied polymorphisms of TLR-4 showed no association with CAD. Conversely, the studied functional polymorphism of CD14 has a statistically significant difference in expression between healthy and affected by CAD individuals. Further studies could prove the use of sCD14 as possible biomarker for severe coronary disease.

Biography

Maria Kalliopi Konstantinidou studied at the Medical University of Crete with a scholarship to pursue research in Boston University. Subsequently, she got involved in research at the University of Athens and completed her PhD, which focused on the genetic predisposition to coronary artery disease, as well as completed a Master's degree in Thoracic Oncology. Having concluded her Cardiothoracic Surgery training in hospitals both in Greece and the UK, she is currently a Clinical Fellow in Cardiothoracic Surgery at Royal Brompton and Harefield NHS Trust in London. She has continued to be active in research co-writing and publishing a number of articles.

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