Association of CCL5 rs2107538, and CCL2 rs3760396 gene polymorphisms with the risk of cardiovascular disease

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Abstract:

BACKGROUND: Chemokines are proinflammatory cytokines that play key roles in development of cardiovascular diseases (CVD). Chemokine-induced recruitment of peripheral leucocytes to tissues is a crucial step in the CVD progression. CC chemokines ligand 5, 2 (CCL5 and CCL2), have been characterized as emerging inflammatory biomarkers of atherosclerotic CVD. AIMS: The aim of this study was to find out whether genetic polymorphisms of CCL5 -403 G>A (rs2107538) and CCL2 –927 G>C, (rs3760396) were associated with the risk of CVD. MATERIAL AND METHODS: A total of 500 Iranian individuals including 250 CVD patients and 250 healthy subjects as the control group participated in this study. Genotyping of CCL5 -403 G>A and CCL2 –927 G>C polymorphisms were executed using Tetra-ARMS PCR method. RESULTS: Our results showed that at genotypic level both CCL5 -403 G>A and CCL2 –927 G>C polymorphisms were not associated with the risk of CVD (P>0.05), even after adjustment by age, sex, race, and history of hypertension, DM and smoking. However, the CCL2 –927 C allele was associated with an increased risk of CVD (OR=1.42, P=0.050) with a higher prevalence in CVD patient than in controls (17% vs. 12%). Moreover, the haplotype analysis revealed that CCL5/CCL2 haplotype (G/C) was a risk factor for CVD (OR=2.13, P=0.001), and that carriers of this haplotype were at 2.13-fold higher risk of CVD than subjects with G/G haplotype. CONCLUSION: Our findings for the first time demonstrated that CCL2 –927 C variant and CCL5/CCL2 haplotype (G/C) were associated with susceptibility to CVD, and were risk factors for CVD in our population.

Keywords: CC chemokines ligand 5, 2 (CCL5 and CCL2), cardiovascular disease (CVD), genetic polymorphism