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Investigating the link between *MCP-1 A-2518G, RANTES G-403A, CX3CR1 V249I* and *MTHFR C677T* gene polymorphisms and the risk of acute myocardial infarction among Egyptians

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Background: Acute myocardial infarction (AMI) is one of the leading causes of death among Egyptians. Monocyte chemoattractant protein-1 (*MCP-1*), regulation on activation normal T cell expressed and secreted (RANTES) and fractalkine (FKN) are chemokines that act as components of inflammatory response while methylenetetrahydrofolate reductase (MTHFR) is important enzyme in folate metabolism essential for homocysteine metabolism. Hyperhomocysteinemia has been linked to *AMI. MCP-1 A-2518G, RANTES G-403A, CX3CR1 V249I* and *MTHFR C677T* are important polymorphisms identified in *MCP-1, RANTES, CX3CR1* and *MTHFR* genes respectively. There are conflicting data in the literature about their association with AMI. Therefore, the aim of the current study was to investigate the contribution of these gene variants to risk of AMI among Egyptians.

Subjects & Methods: The study comprised 200 subjects; 100 AMI patients and 100 age-matched healthy controls. The *MCP-1, RANTES, CX3CR1* and *MTHFR* genotypes were determined by restriction fragment length polymorphism (PCR-RFLP).

Results: Genotypes distributions for *RANTES*, fractalkine and *MTHFR* genes were significantly different between AMI patients and controls (p=0.0221, 0.0498 and 0.0083) while those results in *MCP-1* were not significantly different. A significant risk for AMI with concurrent presence of *RANTES* (AG/AA), fractalkine (VV) and *MTHFR* (CT/TT) genotypes was observed.

Conclusions: Each of *MTHFR 677T, RANTES-403A* and *CX3CR1 249V* alleles is considered an independent risk factor for AMI. Concurrent presence of high risk genotypes of *RANTES* (AG/AA), fractalkine (VV) and *MTHFR* (CT/TT) increases risk of AMI more than their individual risks. *MCP-1* polymorphism is not associated with AMI among Egyptians.

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