ANGIOTENSINOGEN M235T GENETIC VARIANTS IN THE SUSCEPTIBILITY OF HYPERTENSION: EFFECTS ON ENDOTHELIAL FUNCTION AND ARTERIAL STIFFNESS

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Authors: Emmanouel Androulakis, Dimitris Tousoulis, Antigoni Miliou, Nikolaos Papaioannou, Chatzistamatiou Evaggelos, George Moustakas, Anna-Maria Kampoli, Kostas Toutouzas, Stella Brili, Eleftherios Tsiamis, Ioannis Kallikazaros, Christodoulos Stefanadis, Hippokration Hospital, Athens, Greece, Athens

Background: The angiotensinogen M235T polymorphism has been positively associated with essential hypertension and other cardiovascular risk factors, even though the results were inconsistent. Therefore, our aim was to investigate the association of this polymorphism with the prevalence of essential hypertension (EH) and its impact on vascular properties.

Methods: Our population consisted of 303 essential hypertensives stage I-II, and 165 controls. The gene mutation frequency was determined using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) technique. Brachial artery flow-mediated dilatation (FMD) has been used to assess endothelial dysfunction. Aortic stiffness was evaluated, on the basis of carotid to femoral pulse wave velocity (c-f PWV) by means of a computerized method.

Results: The M235T AGT genotype distribution in patients with EH (TT = 16.2 %, MT = 57.6%, MM = 26.1%) did not differ from genotype distribution in controls (TT = 4.9%, MT = 61.9%, MM = 33.1%), while the TT genotype was associated with EH (RR=1.11; 95% CI 1.05-1.18; p<0.01). Interestingly, there was significant difference of FMD between M-allele carriers and TT homozygous both in controls (7.1±2.4 vs 4.1±0.5, p<0.018) and in total population (5.5±3.4 vs 4.2±2.23, p<0.03). Similarly, 235T homozygosity was associated with decreased levels of FMD compared with MM and MT genotype in hypertensive patients, although this difference did not reached statistical significance (4.3±2.8 vs 3.8±2.0, p=NS). Notably, it was found a significant difference between c-fPWV of M-allele carriers and TT homozygous in terms of total population (8.2±1.6 vs 8.8±1.5 m/sec, p<0.01), though this difference was not significant when hypertensive patients were compared (8.9±1.5 vs 8.6±1.6 m/sec, p=NS).

Conclusion: The present study indicates that this polymorphism was associated with the prevalence of hypertension. Moreover, it was also associated partly with impaired endothelial function and increased arterial stiffness. These findings suggest that the angiotensinogen M235T polymorphism exerts an important effect on the vascular biology.