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Association between angiotensinogen gene M235T polymorphism and plasma angiotensinogen level in essential hypertension

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Hypertension is a non-communicable disease and it is an important public challenge worldwide because of its high prevalence. Variants of genes encoding Renin-Angiotensin System have been extensively studied. AGT M235T polymorphism may be the functional genotype, as it affects the basal transcription rate of angiotensinogen. Probably, this phenomenon might explain the association of the AGT M235T genotype and the plasma angiotensinogen concentration. This case-control study was designed to determine the association of the AGT M235T gene variants with essential hypertension and its relationship to plasma angiotensinogen level in essential hypertension as well. In the present study, there were 144 subjects, 72 patients were essential hypertensive subjects collected from outpatient department of Mandalay General Hospital and 72 subjects for control group, which was age, sex, matched hypertensive subjects. After being informed consents, determination of blood pressure and BMI were done. The AGT M235T genotypes were determined by polymerase chain reaction followed by digestion of the products with restriction endonuclease, *Tth1111*. In this study, there was statistically significant association with essential hypertension that identified for TT genotype of M235T polymorphism [OR= 4.93 (95% CI) 1.97 to 12.37]. The frequency of homozygous TT genotype was more common in hypertensive than normotensives. The difference was statistically significant ($\chi^2 = 13.3$, $p=0.000309$). The odd ratio for hypertension with subjects carrying "T" allele was [OR= 2.56 (95% CI) 1.59 to 4.13]. In this study, the mean plasma angiotensinogen level of hypertensive was 65.00 ± 27.73 ng/ml whereas those of normotensives were 24.87 ± 15.06 ng/ml. The mean plasma angiotensinogen level of hypertensive was significantly higher than those of normotensives ($p < 0.001$). Moreover, patients carrying TT genotypes have the higher level of plasma angiotensinogen level than other genotypes MT and MM ($p=0.005$ and $p < 0.001$) in both hypertensive and normotensives. This study shows that AGT M235T polymorphism is significantly associated with the essential hypertension. Therefore, this study gave information that AGT M235T is an important gene for determining susceptibility to essential hypertension. By studying the AGT M235T gene, subjects with risk allele carrier have higher plasma angiotensinogen level and increased risk to essential hypertension in Myanmar.

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