Analysis of renin-angiotensin aldosterone system gene polymorphisms in Malaysian essential hypertensive and type 2 diabetic subjects

ABSTRACT

BACKGROUND: The renin-angiotensin aldosterone system (RAAS) plays an important role in regulating the blood pressure and the genetic polymorphisms of RAAS genes has been extensively studied in relation to the cardiovascular diseases in various populations with conflicting results. The aim of this study was to determine the association of five genetic polymorphisms (A6G and A20C of angiotensinogen (AGT), MboI of renin, Gly460Trp of aldosterone synthase and Lys173Arg of adducin) of RAAS genes in Malaysian essential hypertensive and type 2 diabetic subjects. METHODS: RAAS gene polymorphisms were determined using mutagenically separated PCR and PCR-RFLP method in a total of 270 subjects consisting of 70 hypertensive subjects without type 2 diabetes mellitus (T2DM), 60 T2DM, 65 hypertensive subjects with T2DM and 75 control subjects. RESULTS: There was significant difference found in age, body mass index, systolic/diastolic blood pressure, fasting plasma glucose and high density lipoprotein cholesterol levels between the hypertensive subjects with or without T2DM and control subjects. No statistically significant differences between groups were found in the allele frequency and genotype distribution for A20C variant of AGT gene, MboI of renin, Gly460Trp of aldosterone and Lys173Arg of adducin ($p > 0.05$). However, the results for A6G of AGT gene revealed significant differences in allele and genotype frequencies in essential hypertension with or without T2DM ($p < 0.001$). CONCLUSION: Among the five polymorphisms of RAAS genes only A6G variant of AGT gene was significantly associated in Malaysian essential hypertensive and type 2 diabetic subjects. Therefore, A6G polymorphism of the AGT gene could be a potential genetic marker for increased susceptibility to essential hypertension with or without T2DMin Malaysian subjects.

Keyword: Renin-angiotensin aldosterone system; Gene polymorphisms; Polymorphisms; Malaysian; Hypertensive; Type 2 diabetic subjects