Abstract

Hypertension has emerged as a major cause of ailment and mortality around the world. Despite being one of the most extensively studied medical conditions, the underlying causes remain hidden. Oxidative stress and antioxidant system are key contributors in onset of hypertension. Catalase is an antioxidant enzyme and we hypothesized that single nucleotide polymorphism in *CAT* gene play critical role in the onset of hypertension. Therefore, in current study we recruited 100 hypertensive and 100 normotensive individuals for demographic and genetic analysis. After blood sample collection, genomic DNA was extracted, followed by primer optimization, genotyping using PCR, and DNA sequencing. The research focused at the *CAT* gene SNP codon 389 C>T (rs769217) in exon 9. The significantly higher BMI, SBP, DBP, cholesterol, LDL, VLDL were noticed among hypertensive individuals as compared to normotensive individuals. Individuals carrying a minor allele T of SNP rs769217 ($p<0.001$) had a significant susceptibility towards developing hypertension. SNP rs769217 showed a significant association under codominant and recessive models ($p < 0.001$). Moreover, T/T genotype of variant rs769217 showed higher SBP, DBP and LDL levels. The study concludes by providing evidence linking a *CAT* gene mutation at codon 389 to a higher incidence of hypertension among Pakistani population.

Keywords: *CAT* gene, SNPs, Hypertension, High Blood Pressure