

Association of Variable Number Tandem Repeat Polymorphism of Intron 5 of the Sirtuin-3 Gene with the Risk of Breast Cancer

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Abstract

Introduction: Several studies have reported the lack or down regulation of sirtuin-3 gene expression in various tumors, including breast cancer. A variable number tandem repeat polymorphism has recently been observed in the intron 5 of sirtuin-3 gene, which influences its transcriptional activity. We investigated the association of this polymorphism with the risk of breast cancer.

Methods: After extracting DNA from venous blood of 207 patients with breast cancer and 195 healthy individuals, the samples were genotyped using PCR method by primer pairs flanking the 72 bp repeat region in intron 5 of sirtuin-3 gene. The association of genotypes with risk of breast cancer was analyzed in SPSS 21 using logistic regression test.

Results: The allele and genotype frequencies were separately calculated in the patients and controls. Among the patients and controls, the most frequent allele pertained to one repeat alleles. Statistical analysis indicated that 5- and 6- repeat alleles decrease the risk of breast cancer ($P < 0.0001$). In addition, individuals who had a total of more than 6 repeats enjoyed a decreased risk of breast cancer ($P = 0.044$).

Conclusion: Results of the present study indicate that 72-bp variable number tandem repeat polymorphism in the intron 5 of sirtuin-3 gene may be a significant risk factor for susceptibility to breast cancer.

Keywords: Breast Cancer, Variable Number Tandem Repeat, Intron 5, Sirtuin-3 Gene