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Leptin gene polymorphisms as biomarkers in obese breast cancer patients

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Background: Obesity can develop adipose tissue stores in the body, quantity of body fat could be a significant source of hundreds of biologically active molecules, "Adipokines". Adipokines are strong candidates for the link between obesity and risk of breast cancer. Leptin plays an important role in mammary tumor formation. It is secreted by adipose tissue that acts at the brain to regulate energy expenditure and food intake and has an important role in energy balance, insulin pathway and inflammation. The aim of the present study was to investigate the molecular link between obesity and breast cancer compared to match controls by addressing the role and impact of Lep-2548G/A polymorphism.

Patients & Methods: The present study focuses on the polymorphism leptin gene for variants by screening of this gene in south Indian obese subjects (n=154 obese breast cancer cases and n=145 obese controls). This study followed principles in the Declaration of Helsinki. We utilized PCR- RFLP based assay's to evaluate the association between the Gln2548Arg polymorphism of the leptin gene and breast cancer risk in case control study.

Results & Discussion: The distributions of all three genotypes (GA, GG & AA) in breast cancer cases were 18.8%, 44.8% and 36.4% compared to that of the controls, 33.0%, 29.6% and 37.4%. We found that postmenopausal breast cancer cases showed statistically significant association with GA (rs7799039) genotype when compared with premenopausal women without disease (p=0.001). This difference was between the cases and controls in the Gln2548Arg genotypes.

Conclusion: The G2548A had a 1.93 folds increased risk of breast cancer (p=0.007) and combined genotype (GA+AA) showed 2.13 folds increased risk of breast cancer (p=0.005). Obese cases showed that GA genotype was significantly (p=0.0002) associated with breast cancer women. The difference in the distribution of GA genotype between pre- and post-menopausal showed that GA genotype was significantly (p=0.0001) associated with post-menopausal breast cancer women. Our findings suggest that the LEP Gln2548Arg polymorphism may be a useful biomarker associated with the risk of breast cancer women in Indian population.

Biography

Kaiser Jamil during the last decade, as a CSIR-Emeritus Scientist continued her research on projects related to human health and cancer. She has contributed in the field of Biomarkers in Breast Cancer, Leukemia and Head and Neck Cancer. Her work on SNPs of drug metabolizing genes in cancers, unfolds the mechanisms of several important genes and the networking of the proteins associated with these genes elucidated drug-gene interactions. Continuing her work, she is busy elucidating the role of signaling pathways such as tyrosine kinase inhibitors (TKI) and MAPK in HNC and breast cancer.

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