

CAN TOLL-LIKE RECEPTOR 4 GENE POLYMORPHISM PLAY A ROLE IN PATHOGENESIS OF BREAST CANCER?

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Introduction - Purpose : Breast cancer is one of the most common cause of death from cancer in women worldwide, with approximately a 3% chance that a woman will die of breast cancer. Dynamic interplay between tumors and the immune system is essential for tumor survival, growth, and metastasis. The immune system is known to play a major role in preventing tumor progression by recognizing tumor antigens, and dysregulation of immune system activity could contribute to tumorigenesis. Recent studies have shown that dysregulation of innate immunity receptors such as Toll-like receptors (TLRs) play an important role in the activation of natural and adaptive immunity in response to endogenous hazard signals from pathogens and damaged or dead cells. These receptors are expressed in the immune system cells and some epithelial cells. Recent studies have shown that these receptors are also exaggerated in malignant breast cancer cells. Many studies have shown that the TLR4 gene expression is increased in breast cancer cells, but also associated with metastasis. However, there is no study that could correlate TLR4 gene polymorphisms with breast cancer.

Methods - Tools : We conducted a case study with 100 patients and 100 healthy subjects and planned to investigate whether there is a relationship between TLR4 gene polymorphisms [rs4986790 (Asp299Gly) ve rs4986791 (Thr399Ile)] and breast cancer. In this study, polymerase chain reaction (PCR) based Restriction fragment length polymorphism (RFLP) method was used for gene polymorphisms. The χ^2 test was used to compare the genotype frequency. Odds ratios (OR) and CI (95% current range) were calculated to compare allele's breast cancer risk. Values below the P value of 0.05 were considered significantly different.

Findings : It was observed that there was no possible relationship between breast cancer and TLR4 gene polymorphisms

Discussion : Because TLR-4 plays an active role in the innate immune system, the loss of function of this protein may lead to a depressed immune response, thus promoting cancer development. Genetic alterations in the TLR pathway are also known to be associated with an increased risk of developing breast cancer. Further investigations may be needed for better understanding the implication of TLR-4 polymorphisms in breast tumorigenesis and for its eventual use as a cancer biomarker.

Keywords: breast cancer, gene polymorphism, Toll-like receptor 4