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Investigation p53 Codon 72 Polymorphism and miR-146a rs2910164 Polymorphism in Breast Cancer

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Abstract : Aim: Breast cancer is one of the most common cancers affecting the morbidity and mortality of Iranian women. This disease is a result of collective alterations of oncogenes and tumor suppressor genes. Studies have produced conflicting results concerning the role of p53 codon 72 polymorphism (G>C) and miR-146a rs2910164 polymorphism (G>C) on the risk of several cancers; therefore, a research was performed to estimate the association between the p53 codon 72 polymorphism and miR-146a rs2910164 polymorphism in breast cancer. Methods and Materials: A total of 45 archival breast cancer samples from khatam hospital and 40 healthy samples were collected. Verification of each cancer reported in a relative was sought through the pathology reports of the hospital records. Then, DNA extracted from all samples by standard methods and p53 codon 72 polymorphism genotypes and miR-146a rs2910164 polymorphism genotypes were analyzed using multiplex PCR. The tubules, mitotic activity, necrosis, polymorphism and grade of breast cancer were staged by Nottingham histological grading and immunohistochemical staining of the sections from the paraffin wax embedded tissues for the expression of ER, PR and p53 was carried out using a standard method. Finally, data analysis was performed using the 7 version of the Epi Info(TM) 2012 software and test chi-square(x2) for trend. Results: Successful DNA extraction was assessed by PCR amplification of b-actin gene (99 bp). According to the results, p53 GG genotype and miR-146a rs2910164 CC genotype was significantly associated with increased risk of breast cancer in the study population. In this study, we established that tumors of p53 GG genotype and miR-146a rs2910164 CC genotype exhibited higher mitotic activity, higher polymorphism, lower necrosis, lower tubules, higher ER- and PR-negatives and lower TP53-positives than the other genotypes. Conclusion: The present study provided preliminary evidence that a p53 GG genotype may effect breast cancer risk in the study population, interacting synergistically with miR-146a rs2910164 CC genotype. Our results demonstrate that the testing of p53 codon 72 polymorphism genotypes and miR-146a rs2910164 polymorphism genotypes in combination with clinical parameters can serve as major risk factors in the early identification of breast cancers.

Keywords : breast cancer, p53 codon 72 polymorphism, miR-146a rs2910164 polymorphism, genotypes
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