

MOLECULAR STUDY OF ApoE GENE POLYMORPHISMS AMONG IRAQI PATIENTS WITH THE BREAST CANCER

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ABSTRACT : Breast cancer is more frequent cancer among women worldwide. In this study, the association between ApoE gene polymorphisms and breast cancer has been investigated. This case control study include two groups : thirty women with breast cancer; fifteen healthy women as control group. Molecular analysis included determine polymorphism of Apoe genes in study groups. Apoe gene polymorphism was analyzed using Polymerase chain reaction-restriction fragment length polymorphism PCR-RFLP. Nucleotide polymorphism variants and different genotypes of Apoe gene have important roles in the development of cancer. The results of the study showed that there is also a relationship between Apoe polymorphism and breast cancer. Where, the results showed that the E₂/E₂ genotype among breast cancer patients is two times more than in control (13 VS 6 P< 0.05). E₂/E₄ genotype is common in patients (7 VS 1 < 0.05). There are no significant difference when comparing E₃/E₃ genotype In the study groups, where the E₂/E₄ genotype Is a high risk factor of breast cancer (OR=4.2609(0.473-38.383)). Followed in terms of risk E₂/E₂ genotype (OR=1.147(0.3252-4.0455)). Different combinations in genotypes revealed different risk association. All these results imply that SNPs studies must be conducted on cancer patients and radiation staffs as routine investigation to watch for and prevent DNA damage as much as possible.

Key words : ApoE gene, polymorphism, breast cancer.

INTRODUCTION

Breast cancer is a malignant tumor that starts in the cells of the breast most commonly from the inner lining of milk ducts, or lobules that supply the ducts with milk (Sariego, 2010). It is mainly the most frequent cancer detected in women and in the world it is the main reason for death from cancer in women (Sun *et al*, 2012). Most of the morbidity and death rates of patients with cancer are caused by metastasis of the cancerous cells to faraway organs. Metastasis occurs mainly in lung, bone, liver lymph nodes and in the brain. In spite of the continuous development in methods of detection, surgery and chemotherapy, mortality rates from cancer of the breast still high (Hallet *et al*, 2013).

The genetic polymorphisms of APOE are among the most extensively investigated, particularly due to the effects of APOE on lipid profiles and the risk of coronary heart disease (Eichner *et al*, 2002). The structural gene locus of APOE is polymorphic (Mahley and Rall, 2000): there are three common alleles, namely e2, e3 and e4, coding for three isoforms, namely E2, E3 and E4, respectively, which produce three homozygous genotypes (E2/E2, E3/E3 and E4/E4) and three heterozygous

genotypes (E2/E3, E2/E4 and E3/E4) (Hartman *et al*, 2002).

The association between APOE and Breast Cancer has not been definitively established and the results are often conflicting. Despite the availability of data associating the frequency of APOE genotypes with cancer in general, the number of studies investigating the association between Breast Cancer and APOE is currently limited, whereas this association in the Iranian population has yet to be investigated. In this context and since APOE is known to modify the association between dietary intake and blood lipid levels, we aimed to evaluate the association between APOE allelic frequency, serum lipoproteins and Breast Cancer risk in a sample of women from Iraq. This study aim to investigate the possible association between ApoE gene polymorphism and breast cancer .

MATERIALS AND METHODS

Detecting of Apolipoprotein E genotyping PCR-RFLP and genotyping

In order to distinguish the apoE alleles (E₂, E₃ and E₄) that encode the different isoforms, PCR-restriction fragment length polymorphism (PCR-RFLP) was used. The primers used for amplification of apoe gene exon 7,

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