

Effect of MDR1 polymorphism on multidrug resistance expression in breast cancer patients

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ABSTRACT. One of the limitations in the treatment of cancer patients with chemotherapy is the development of multidrug resistance (MDR). A well-known mechanism responsible for drug resistance is over-expression of ABC-transporter genes such as MDR1. This gene encodes p-glycoprotein (P-gp), a transmembrane glycoprotein that transports many hydrophobic substrates and anti-cancer drugs out of the cell. MDR1 gene polymorphisms could alter the expression level of P-gp and consequently result in drug resistance. We investigated a possible association between MDR1 gene C3435T polymorphism and its expression in Iranian breast cancer patients. PCR-RFLP was used for the detection of C3435T single nucleotide polymorphism in 54 breast cancer patients and 50 healthy individuals. The expression level of MDR1 was determined by real-time quantitative PCR. We observed no difference in the frequency of C3435T polymorphism between breast cancer patients and healthy controls. However,

there was a significant association between MDR1 expression levels and C3435T polymorphism in the patients. C3435T polymorphism may play a role in inducing drug resistance by altering the expression level of the MDR1 gene.

Key words: Multidrug resistance; MDR1 gene; C3435T polymorphism; Real-time polymerase chain reaction; Breast cancer