

## Co-Expressional Protein Products of BRCA-1 and EBV-EBNA-1 Genes in Tissues from Human Female Patients with Breast Cancers: An Immunohistochemical Screening Study

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**Abstract :Back ground:** Breast malignancies are most frequently diagnosed among women in many populations world-wide as well as in Iraq. Although the genetic mutations in BRCA -1 and BRCA - 2 genes are still constituting up to 90% of the total risk for breast cancers, yet many indirect evidences are supporting a role for an association of EBV with such cancers.

**Objective:** To analyze the rate of EBV infection in the breast tissues in association with defects and / or mutations in BRCA-1 gene, by assessing the endogenous levels of the total expressed BRCA-1- as well as EBNA-1 protein products, and their relations to the differentiation of primary invasive breast cancer tissues.

**Patients and methods:** Fifty-four (54) formalin-fixed, paraffin- embedded breast tissues were obtained in this study; (34) biopsies from breast cancers (BC) and (20) from apparently normal breast autopsies as a control group. Detection of protein expressional products of EBNA-1 gene of Epstein Barr Virus as well as BRCA-1 gene was done by HRP/DAB immune-enzymatic antigen detection system using specific rabbit-anti-human primary antibodies for EBV-EBNA -1 as well as detected or mutated BRCA-1 protein products.

**Results:** Detection of EBNA-1 - immunohistochemical (IHC) reactions in tissues with BC was observed in 12 out of 34 (35.3%), while in healthy breast tissues in the control group was detected in 10% (2 out of 20). Detection of BRCA-1- protein- immunohistochemical (IHC) reactions in tissues with BC was observed in 16 out of 34 (47.1%), while none of the examined healthy breast tissues in the control group revealed such IHC-reactions. The difference between the percentages of BRCA-1- as well as EBNA1 proteins detection in BC tissues & control group was statistically significant (<0.05). Among breast cancer tissues that showed score I of IHC reactions for BRCA1, 68.8% have well differentiated grade; and 18.7% of those tissues that have score II- IHC reactions showed moderate differentiated grade and lastly, 12.5% of the BC tissues which showed score III have presented as poorly differentiated BC tissues. However, statistical significant differences between the frequencies of EBV-EBNA1 and BRCA-1- immunohistochemical reactions were neither observed in relation to the age of these breast cancer patients nor to the grade of invasive breast cancer tissues (P value > 0.05).

**Conclusions:** Our results indicate that the EBV might contribute to the development of subset of breast tumors. The present results of the rates of defects or mutations in the BRCA-1- genes in relation to the grade of breast cancer tissues also could point for their occurrence and contribution as early events in breast carcinogenesis.

**Keywords :** Breast cancer; Epstein Barr Virus; EBV - EBNA 1; Defects / Mutations; BRCA-1- Gene; Immunohistochemical technique.