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Breast cancer recurrence monitoring a corroding to tumour subtypes: Role of serum tumour markers CA 15-3 and CEA using radioimmunoassay

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Introduction: Breast cancer is one of the most common types of cancer worldwide, with increasing incidence and mortality. Breast cancer patients concerned to avoid of breast cancer recurrence. Tumor markers are substances found in the body and produced by cancer cells. Tumor markers and imaging tests such as Computed Tomography (CT) , Positron emission tomography (PET) and bone scans have been used for monitoring breast cancer recurrence after therapy, these imaging have risk and cost, while tumor markers is easy and cost-effective. The aim of this study to detect the early breast cancer recurrence using tumor markers Cancer Antigen15-3 (CA 15-3) and Carcinoembryonic Antigen (CEA) during therapy
Methods:
Forty six of breast cancer women in age ranged between 17 and 65 years, were selected randomly to participate in this study, 23 of them were on treatment for 3 months (Chemotherapy doses) and 23 were complete the first line of therapy about 6 months (Ionizing radiation and chemotherapy doses /or complete chemotherapy regime). Clinical data information including age at diagnosis, stage , estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) status. Radioimmunoassay used for measuring the concentration of serum CA 15-3 and CEA in breast cancer patients, the reference range of serum CA 15-3 is < 30 U/Ml and CEA is < 3.0 ng/ml. Patients were followed up by observed them in the clinic for 24 months.
Results
The mean and standard deviation of CA 15-3 of breast cancer patients on treatment were (18.0 ± 11.3), while in the patients after treatment were (16.0 ± 9.0). The mean and standard deviation of CEA for the patients on treatment and after treatment were (4.3 ±5.0) and (4.5 ±5.5) respectively. Twenty-two patients were luminal B and Twenty-four patients were triple negative subtypes. Twenty of the patients suffered the early recurrence in a period less than 24 months. High levels of CA 15-3 seen only in five patients in stage3 and luminal B subtype (ER+, PR+/ PR-, HER2+). While elevation of CEA levels observed in, tow patients were luminal B and twelve patients were tribal negative breast cancer subtypes. However, three patients suffered distance recurrence in bone and lung, were have normal serum levels of tumor markers CA15-3 and CEA during treatment, and tow patients of them died during follow-up period . Figure (1) explains the mean levels of CA15-3 and CEA among breast cancer subtypes in this study.

Figure1: Mean levels of Tumour Markers CA15-3 and CEA among breast cancer subypes
Conclusion
CA 15-3 may be useful for monitoring breast cancer recurrence at initial recurrence diagnosis in luminal B subtype. Elevated CEA serum levels during treatment were associated with early recurrence in luminal B and tribal negative breast cancer subtypes. Tumor markers CA 15-3 and CEA cannot monitor breast cancer recurrence in some cases such as distance recurrence in bone or lung.

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