wjpmr, 2018,4(9), 101-103

SJIF Impact Factor: 4.639

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

THE EVALUATION OF TUMOR MARKERS LEVELS IN PRE AND POSTMENOPAUSAL BREAST CANCER WOMEN

Enas H. Hameed*[1], Sura Z. Hussein[1], Nazar A. N. Abed[2]

[1]Chemistry Department College of Science Tikrit University Iraq.
[2]Clinical Biochemistry Unit Tikrit Teaching Hospital Iraq.

***Corresponding Author: Enas H. Hameed**

Chemistry Department College of Science Tikrit University Iraq.

Article Received on 26/06/2018 **Article Revised on 16/07/2018** **Article Accepted on 06/08/2018**

ABSTRACT

Tumor markers are substances produced by the tumors or by other cells of the body in response to cancer or certain benign conditions. The cancer antigen (CA15-3) and carcinoembryonic antigen (CEA) are tumor markers that are often expressed in people with breast cancer. These tumor markers are most useful for monitoring response to therapy and detecting early relapse. Serum samples were collected from 140 women were ,50 of these women were control and 90 women were breast cancer patients attending to cancer center in Erbil city from Jaunary 2017 to Augest 2017.Study populations classified into three groups which age ranged from (29-65) years, total subjects, pre and postmenopausal women. The results of CEA and CA15-3were showed a highly significant increase ($P \leq 0.01$) in total and (pre and postmenopausal) breast cancer patients compare with healthy control. Elevated CA15-3 levels are more common in metastatic breast cancer patients than with other tumor markers (e.g., CEA) and concluded from this study CEA and CA15-3 levels were increased, in patients compare to healthy control group.

KEYWORDS: Tumor markers, carcinoembryonic antigen.

INTRODUCTION

Breast cancer is the second most common type of cancer after lung cancer.[1] It is a disease caused by a combination of genetic and environmental factors, numerous risk factors that may be associated with breast cancer have been recognized.[2] Tumor markers(TM) are molecules arising in tissue or blood that are secreted by a tumor or by the host in response to the tumor whose measurement or identification is beneficial for clinical diagnosis or patient managing.These tumor markers are most useful for monitoring response to therapy and detecting early relapse.[3] A Cancer antigen 15-3 (CA 15-3) is a protein that is a normal product of the breast tissue. If a cancerous tumor is present in the breast, the level of CA 15-3 may increase as the number of cancer cells increase. (CA15-3) is murine monoclonal antibody made by normal breast cell (molecular weight: 300–450 kDa). In numerous patients with cancerous breast cancer, there is an elevated creation and molting of CA 15-3 by the cancer cells. Although CA15-3 is more specific for breast cancer, it has no role as a screening tool, as levels are normal in over 80% of women with localized disease. In combination with CEA, sensitivities of around 60% can be obtained in detecting recurrent disease.[4]

Carcinoembryonic antigen (CEA) which belongs to a family of related cell surface glycoproteins, is the most widely used tumor marker in the clinical practice. It is a tumor marker for colorectal, gastrointestinal, lung and breast cancer.[5] CEA was first identified as a tumor specific antigen found in extracts of tumor tissue. It is also found in normal foetal gastrointestinal tract epithelial cells. It is a glycoprotein that contains 45e50% carbohydrates. It is a single polypeptide chain consisting of 641 aminoacids,[6] (molecular weight:180 kDa), the CEA assay because of its low sensitivity in both early and advanced diseases compared with CA 15-3.Also it was a blood test that done during breast cancer treatment to monitor progress.[7] Serum CEA and CA15-3 can be used in the diagnosis of metastatic breast cancer; they pointed out that the highest sensitivity was seen in CEA for the diagnosis of metastatic breast cancer.[8] Serum levels of CEA and CA15-3 are independent prognostic parameters for breast cancer. In their study, elevated serum levels of CEA and CA15-3 were observed in patients with breast cancer, also, patients with both elevated markers (CEA and CA15-3) presented the worst survival.[9]

The aim of this studytomeasuring the level of serum CEA and CA 15-3 of breast cancer women in total subjects with all stages, premenopausal and postmenopausal women compare to control group.

PATIENTS AND METHODS

After informed consent from each subject, a full information were obtained using a questionnairethat include name, age, residence, education, marital status, last menstrual period (LMP), smoking as well as the following information about

1. Medical history for any previous and recent illness and the type of treatment.
2. Family history of breast cancer.
3. Family history of other cancer.
4. Drugs intake especially combined contraceptive pills and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs).
5. Treatment: classified depending on the type of treatment for breast cancer patients as following: chemotherapy, surgery, radiation mixed (two or more of treatment).

Serum samples were collected from 140 women were ,50 of these women were control and 90 women were breast cancer patients attending to cancer center in Erbil city from Jaunary 2017 to Augest 2017.Study populations classified into three groups which age ranged from (29-65) years, total subjects, pre and postmenopausal women.

Five milliliters (mls) of venous blood were drown from each patients and controls by vein puncture left to clot, and then centrifuged at 4000 r.p.m. for 15 min. Serum was separated and stored at -20 C˚ until time of analysis. The CEA andC 15-3 levels were detected by electrochemoeliomenecence technique via Cobas E411 instrument.

RESULTS

The mean ± SD of serum (CEA) level for breast cancer patients and healthy control was shown in (table and figure 1) which was (6.0 ± 5.12) ng/ml and (1.509 ± 0.487) ng/ml respectively. These results showed that there was a highly significant increase (P≤0.01) in breast cancer patients compare with healthy control, while the mean ± SD of serum CEA level for Premenopausal and postmenopausal breast cancer as shown in (table and figure 1) which was (4.79 ± 4.02) ng/ml and (8.60 ± 7.54) ng/ml respectively. These results showed that there was a highly significant increase (P≤0.01) in Premenopausal and Postmenopausal of breast cancer patients compare with healthy control.

Table 1: Level of CEA (ng/ml) in breast cancer women and control.

Groups	No. of subjects	Mean±SD	P value
Control	50	1.50±0.48	
Total	90	6.0±5.21	P≤0.01
Premenopausal	50	4.79±4.02	P≤0.01
Postmenopausal	40	8.60±7.54	P≤0.01

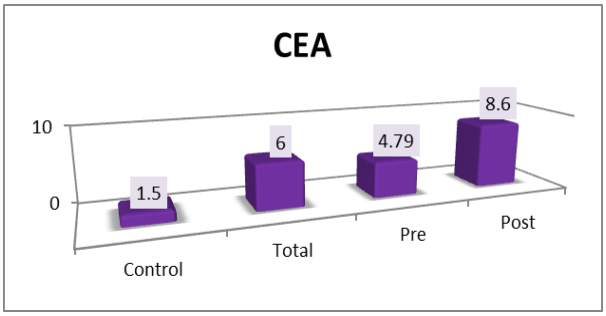

Figure 1: Level of CEA in breast cancer women and control.

The mean ± SD of serum Cancer antigen level (CA15-3) for total breast cancer and healthy controlwas shown in (tableand figure 2) which was (42.3 ± 40.1) U/ml and (4.87 ± 1.10) U/mlrespectively. These results showed that there was highly significant increase (P≤0.01) in total breast cancer patients compare to healthy control, while the mean ± SD of serum CA15-3leval for Premenopausal and Postmenopausal patients was (36.91 ± 33.16) U/ml and (48.89 ± 46.78) U/ml respectively.These results showed that there was a highly significant increase (P≤0.01) in Premenopausal and Postmenopausal patients compare to healthy control.

Table 2: Level of CA15-3 (U/ml) inbreast cancer women and control.

Groups	No. of subjects	mean±SD	P value
Control	50	4.87±1.10	
Total	90	42.3±40.1	P≤0.01
Premenopausal	50	36.91±33.16	P≤0.01
Postmenopausal	40	48.89±46.78	P≤0.01

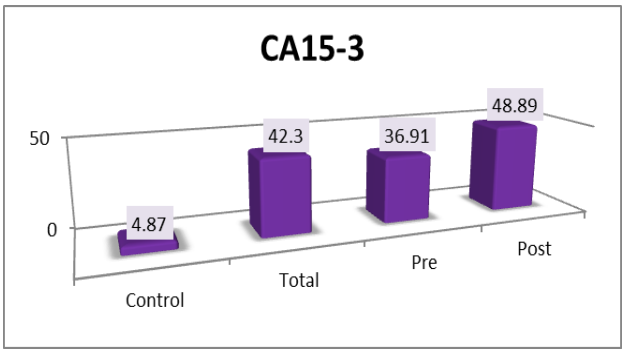

Figure 2: Level of CA15-3 in breast cancer women and control.

DISCUSSION

CEA is one of the first tumor marker to be identified and characterized, that CEA low sensitive compared with that of CA 15-3 in detecting breast cancer.[10] because of their lack of organ and tumor specificity, they do not play any role in screening, but they can be used in early detection of recurrence disease and as a cost- reducing tool for therapy monitoring, and investigation the association of elevated tumor markers and disease progression.[11]

The presence of an abnormal CA15-3 value is associated with an increased risk of recurrence and death.CA15-3 is a useful marker for the early diagnosis of metastases in patients with breast cancer and alsoit can be used in early detection of recurrent disease and as a cost-reducing tool for therapy monitoring. However, patients developing multiple metastases at first disease progression already had higher CA15-3 values at the time of diagnosis of metastatic disease as compared to patients with progress at the same localization.CA15-3 assays could be a good marker for evaluating the progression of breast cancer.[12] Elevated CA15-3 levels are more common in metastatic breast cancer patients than with other tumor markers (e.g., CEA), so CA15-3 is more valuable than CEA and is gradually replacing CEA in follow-up of patients with metastatic breast cancer.[13]

CONCLUSIONS

In total, premenopausal, postmenopausal breast cancer patients:- CEA and CA15-3 levels were increased, in patients compare to healthy control group.

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