Comparing the Values of Some Indicators of Liver and Kidneys Among Women with Breast Cancer and Accompanying Patients in Ramadi City

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Abstract

Cancer is one of the deadliest diseases facing all global societies now, the current study aimed to detect changes in liver and kidney functions in breast cancer patients and compare them with healthy people as a control group, the current study included samples of (60) women, distributed as follows (20) of breast cancer patients, (20) of female companions, (20) of healthy women, ranging in age from (20-60) years. The samples were collected from Anbar specialized Oncology Center in Ramadi city, Anbar Province. The results showed a significant increase in the level of enzyme concentration (AST) at the level of probability ($p \leq 0.05$) in the blood serum of breast cancer patients at a rate of (28.6 IU/L) compared to healthy (27.90 IU/L) as a control group, while the level of the enzyme (ALT) concentration decreased by an average of (19.7 IU/L) in the blood serum of breast cancer patients compared to healthy at a rate of (24.4 IU/L), while the results of the renal function test gave a significant difference in the level of creatinine concentration in the blood serum of breast cancer patients while the result of urea and total protein did not give any significant differences.

Keywords: *Indicators of Liver, Indicators of Kidney, Breast Cancer Patients.*

Introduction

Cancer cells grow and multiply in a way that is very difficult to control. Each organ in the human body is made up different types of cells that divide regularly to form many cells that maintain the body's condition in a good healthy condition, as these cells divide irregularly, this leads to the formation of a mass of tissue known as a tumor. These cancer cells can move in the body through the lymphatic system or through the circulatory system to infect new organs within the body. The tumors are divided into benign tumors, which are not dangerous and their cells are similar to the original tissue and located in the place of its primary origin and characterized by not spreading to other parts of the body. The second type is a malignant tumor, and these tumors are dangerous, as they can either spread to the other organs and tissues adjacent to this malignant tumor, or some of the tumor cells can grow and spread away to new places in the body after detachment and this spread is called metastasis (Isabelle et al., 2008). Cancer patients often suffer from major changes in their lives due to the diagnosis and treatment of the disease, all of which negatively affect the nature of their lives in different ways (Penttinen et al., 2011), that is, it affects the

physical, social and psychological condition of patients (Ali et al., 2008), in addition to Evaluation of the quality of life helps in evaluating the results of treatment and reduces the physical, psychological and social effects of cancer (Ali et al., 2008). Cancer treatments such as chemotherapy and radiotherapy generally destroy cancer cells in the body. However, some normal cells are also sensitive to these treatments and are damaged. During the process, some cancer treatments interfere with the production of blood cells in the body. A complete blood count (CBC) is routinely done during chemotherapy and other breast cancer treatments to check the number of each type of blood cell circulating in the body. A complete blood count also helps in checking the various side effects of chemotherapy, as the liver is a risk organ within radiotherapy for chest and abdominal tumors, as changes in liver function tests (LFTs) of patients are checked during radiotherapy or cauterization. LFTs help in diagnose the liver disorders, detect infections, and avoid liver damage during radiotherapy and chemotherapy (Xiaoan et al., 2000). Early diagnosis of liver metastasis from breast cancer is helpful in timely treatment, which in turn helps to better diagnosis of liver lesions because it provides accurate results (Saad et al, 2004). LFTs also measure levels of important chemicals including liver transaminase (SGOT, SGPT). These enzymes, previously known as SGOT and SGPT, are now known As ALT and AST are normally found in liver cells that leak out of cells and mix with blood when liver cells are infected. Cancer patients may suffer of liver damage as a side effect of some cancer treatments or because cancer has spread to the liver (Zahedi et al., 2016). The estimate of kidney function (KFT) is used to conduct a variety of tests, including the test of urea and creatinine in the blood. It is performed to evaluate the performance of the kidneys before giving treatment, during treatment and after it, as chemotherapy can cause necrosis in kidney cells, as this damage is manifested in Alter urea and creatinine levels before and after chemotherapy (C D. Drug, 2016).

The current study aimed to measure the concentration of liver enzymes that transport the amino group (AST, ALT), in addition to measuring the concentration of kidney function, which included (Creatine, urea, and total protein) for breast cancer patients compared to healthy people.

Materials and methods

Collecting of sample

This study included (60) samples, all of them women, where 5 ml of blood was drawn from the samples and the samples were divided into three categories: the first category included (20) samples of women with breast cancer, (20) other samples of women accompanying sick women and (20) other samples were healthy women. These samples were collected from the Anbar specialized Oncology Center for a period of 3 months and the ages of the infected women ranged from 30-55 years, the ages of the women accompanying the sick women ranged from 20-60 years, and the healthy women ranged from 25-45 years.

Kidney Function Tests

Measurement of the concentration of creatinine in the blood serum

The concentration of creatinine in the blood serum is measured according to the method supplied with the measuring kit manufactured by FUJI Corporation (Vietnam) (Tietz, 1999).

Measurement of total protein concentration

The total protein concentration is measured according to the Biuret Method, this method relies on the interaction of copper ions of the detector with the peptide bonds of the protein, in order to form a complex with a violet color, based on (Tietz, 1987).

Measurement of urea concentration in the blood serum

It is done by using the Berthelot Method for the determination of urea in blood serum, as this method relies on the conversion of urea into ionized ammonium carbonate by means of the urease enzyme (Underwood, 1979).

Liver Function Tests

Evaluation of the activity of the AST enzyme in blood serum Aspartate Aminotranssaminase (AST)

The activity of the enzyme transporting the amine group in blood serum is estimated according to the method attached to the measuring kit manufactured by RANDOX (Reitman & Frankel, 1957).

Evaluation of the activity of the ALT transporter enzyme in serum Aspartate Aminotranssaminase (AST)

The activity of the enzyme transporting the amine group in blood serum is estimated according to the method attached to the measuring kit manufactured by RANDOX (Reitman & Frankel, 1957).

Statistical analysis

The results were statistically analyzed using the SPSS program 23 and using the Analysis of Variance (ANOVA TABLE) to calculate the variance, test the averages using the least significant difference test L.S.D at the probability level of 0.05. The averages were also compared using the standard error (Steel& Torri, 1980).

Results and Discussion

Biochemical Traist of Blood

The concentration of liver enzymes: transaminase enzymes (ALT, AST).

The results of current study have shown in table (1) that (ALT) enzyme activity at a probability level is ($P \leqslant 0.05$) in patients with breast cancer which showed a significant decrease at a rate of (19.7 IU/L), compared to patient companions (23.15 IU/L) and healthy at a rate of (24.4 IU/L) as a control group, and this may be due to an increase in lactic acid in the blood (Orr et al., 2020).

For the activity of the transporter enzyme of the AST group, the results showed in table (1) a significant increase in the blood serum of the infected at a rate of (28.6 IU/L) compared to the patient companions at a rate of (27.10 IU/L) and healthy at a rate of (27.90 IU/L) as a group. As a control, the activity of (AST, ALT) enzymes was chosen to study and evaluate the effectiveness of liver function performance, since the liver is the organ responsible for cleaning the body from many waste and toxic substances (Clarke & Clarke, 1977).

According to the results of this current study, the activity of liver enzymes ranged from a slight increase to a decrease in patients with breast cancer, and this may be due to a decrease in the performance and effectiveness of the liver as a result of breast cancer.

 The result of this current study was identical to what was reached by (AL hashemi et al, 2022), which indicated an increase in the level of enzyme (AST and ALT) in the blood serum of women with breast cancer at a probability level ($P \leqslant 0.05$) compared to the control group

(healthy). Also, the results of this study did not agree with what was reached by (Mahmood 2019), which indicated a decrease in the level of AST enzymes. (ALT) in the serum of patients with breast cancer compared to the control group.

Table (1): Liver Functions

	ALT	AST
Patients	19.700 ± 1.20	28.60 ± 2.03
Patient companions	23.150 ± 1.24	27.10 ± 1.92
Healthy	24.400 ± 1.76	27.90 ± 1.27
Sig.	0.062	0.84
L.S.D. 5%	4.03	5.95
Cv%	28.4	33.7

Kidney function indicators (creatinine, urea, total protein)

The results of the statistical analysis shown in table (2) indicated that there were significant differences at the probability level (P ≤0.05), with a concentration rate of (mg/dl 0.55) in the blood serum of patients with breast cancer compared to those with a concentration rate of (mg/dl 0.60). There were also significant

differences between the infected group and the healthy group with a concentration rate of (0.47 mg/dl) as a control group.

A decrease in the level of creatinine concentration in the blood is an indication of a decrease in the size of the muscle mass, and low levels of creatinine are associated with glomerular hyper filtration that increases the risk of metabolism and an increase in susceptibility to T2DM (Harita et al., 2009).

The results also have showed a decrease in the level of urea concentration among the infected at a probability level (P ≤ 0.05) at a concentration rate of (26.9 mg/dl) compared to healthy at a concentration rate of (27.5 mg/dl) as a control group, while the result of the total protein concentration of this study was high. In the blood serum of patients with breast cancer at a concentration rate of (7.5 mg/100ml) compared to healthy at a concentration rate of (7.3 mg/100ml). The results of this study were consistent with what was reached by (Jessica et al., 2017) which indicated a high level of total protein and creatinine for breasts cancer patients compared to the control group.

Table (2): Kidney Function

	CRE	Urea	T. Protein
Patients	0.5515±0.07	26.915±1.23	7.560±0.1348
Patient companions	0.6055±0.08	26.825±0.98	7.410±0.1235
Healthy	0.4760±0.024	27.510±1.09	7.365±0.1096
Sig.	0.004	0.089	0.507
L.S.D. 5%	0.075	3.126	0.3486
Cv%	21.7	18.2	7.4

Conclusion

Breast cancer has an effect on the concentration of the AST enzyme, as its level increased compared to the companions and healthy as a control group, while the results of kidney

examinations showed a significant difference in the creatinine concentration of breast cancer patients compared to the companions and healthy subjects as a control group.

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