

**Breast Cancer in Mosul: A Survival Analysis**

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Breast cancer is the most common cancer in women, and the major cause of death. This study was conducted in order to make a descriptive study and survival analysis for breast cancer patients in Mosul. Two hundred forty-six early diagnosed women with breast cancer out of 290 patients were included during the period from March 2007 to February 2012. The average follows up was 36.

months (range: 11-67 months). The patients were undergone modified radical removal of the breast, chemotherapy and deep radiation. Patients with estrogen positive were given tamoxifen for five years. Patients with Her2/neu positive were given trastuzumab with docytaxil for one year. Only 25 patients (10.2%) died during the study. The highest incidence of breast cancer (35.8%) was between the ages  $51 \geq 60$  years. The presentation of cancer was high (90.1%) in the lumber. Tumor in the right side (66.35%) was significantly higher than the left side. Metastasis was high (25%) and most of them in the liver (19.1%). The percentage of patients with positive estrogen, progesterone, and Her2/neu receptors were not different from negative receptors. Cox regression analysis showed that metastasis had significant effect on death (hazard ratio=2.917). Age  $31 \geq 40$  years was the least affected age (hazard ratio=0.034). In conclusion, survival rate of breast cancer patients in Mosul is high due to good management. The early detection of cancer is the best way for survival of the patients, by developing the educational programs.

**Key words:** Breast cancer, survival analysis, Her2/neu, hazard ratio.**سرطان الثدي في الموصل: تحليل البقاء على قيد الحياة**

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**الخلاصة:**

يعتبر سرطان الثدي الأكثر شيوعاً في النساء وهو السبب الرئيسي للوفاة. أجريت دراسة وصفية وتحليل البقاء على الحياة للمريضات بسرطان الثدي في الموصل. وشملت الدراسة على 246 من النساء المصابات بسرطان الثدي من أصل 290 مريضة للفترة من آذار 2007 إلى شباط 2012. وكان معدل متابعة المرضى 36 شهراً (ما بين 11-67 شهراً). وكان قد أجريت عملية رفع الثدي للمريضات، والعلاج الكيميائي والإشعاعي.. وأعطيت المريضات حاملة موجب الاستروجين عقار تاموكسيفين ولمدة خمسة سنوات. أما المريضات حاملة Her2/neu الموجب فقد أعطيت عقار trastuzumab مع عقار docytaxil لمدة سنة. ومات 25 مريضة (10.2%) خلال فترة الدراسة. وكانت أعلى نسبة بسرطان الثدي (35.8%) بين عمر  $51 \leq 60$  سنة. وكان الصدر أعلى مكاناً للسرطان. وكان السرطان في الجهة اليمنى (66.35%)

اعلى معنويا من الجهة اليسرى. وكان نسبة انتشار السرطان عالية (25%) ومعظمه في الكبد (19.1%). وكانت نسبة المريضات حاملة موجب المستقبلات الاستروجين والبروجستيرون و Her2/neu لا تختلف معنويا عن المريضات سالبة المستقبلات. وبين تحليل انحدار كوكس ان انتشار المرض له تاثير معنوي على نسبة الموتى (نسبة الخطر = 2.917). وكان العمر بين 31 ≤ 40 سنة هو العمر الاقل تأثرا بالسرطان. وكان الاستنتاج ان نسبة البقاء على الحياة لمريضات سرطان الثدي عالية في الموصل للعناية الجيدة. ان الكشف المبكر على سرطان الثدي هو احسن طريقة للبقاء على الحياة، ويكون من خلال البرامج التثقيفية.

**الكلمات المفتاحية:** سرطان الثدي، تحليل البقاء على الحياة، مستقبل Her2/neu، نسبة الخطر.

## Introduction

Breast cancer is the most common cancer in women and the most frequent cause of death in women in both developing and developed regions [1]. Breast cancer in Iraq becomes a major threat to female and it is the highest type of cancer and represents 34.4% of the most popular cancer in Iraq [2].

Many studies have been performed in Iraq on breast cancer. The incidence of female breast cancer in Iraq was increased, with rapid increase in the age group 60-69 years [3]. In a descriptive study of breast cancer women in missan (south of Iraq) during the period 2005-2009, most of the patients were of low socio-economic states and low education and 70% of the patients were in stage III and IV [4]. The ministry of health in Iraq has initiated successful programs for cancer registry of most common cancers since the seventies of the last century [2]. However, few studies have been conducted on survival analysis of breast cancer in Iraq. A survival analysis study on breast cancer patients in Mosul could not be found. In neighbor countries especially in Iran, many studies on survival analysis on breast cancer in different regions of the country have been published [5,6].

The purpose of this work was to make a descriptive study and survival analysis for breast cancer patients in Mosul, North of Iraq.

## Patients and methods

This study was conducted at Ninevah Medical Center and Al-Jammhori Teaching Hospital, Mosul, Iraq, during the period from March 2007 to February 2012. Two hundred forty-six early diagnosed patients with breast cancer out of 290

patients were included during the five-year study and followed to the end of the study. The age range of the patients was between 20-70 years (mean± SD: 49 ± 10.6 years). The patients were undergone modified radical removal of the breast. Samples from the tumor on paraffin sections were taken from the patients and sent to Histopathology Department in Al-Jammhori Teaching Hospital for the analysis of Her2/neu, estrogen, and progesterone receptors by immunohistochemical method (Hercep Test™ for the Dako Autostainer Dako Company, Denmark).

Combination therapy of 5-fluorouracil 500 mg/m<sup>2</sup>, epirubicin 100 mg/m<sup>2</sup>, and cyclophosphamide 500 mg/m<sup>2</sup> for three cycles every 21 days was given to the patients followed by three cycles of docytaxel 100 mg/m<sup>2</sup> every 21 days. Patients with estrogen positive were given tamoxifen 20 mg/day for five years after completion chemotherapy. Patients with Her2/neu positive were given trastuzumab 6 mg/kg BW with docytaxel 100 mg/m<sup>2</sup> every 21 days for one year started after 21 days of docytaxil cycle. Patients with estrogen positive were given tamoxifen 20 mg/day. Radiotherapy was given to patients with lymph node positive after six weeks of the last chemotherapy, every six weeks for six sessions.

The average follows up was 36 months (range: 11-67 months). Data were collected for clinical characteristics and analyzed using Life Table analysis to estimate the overall survival rate. Cox-regression was used to find the hazard ratio and interaction between variables. Statistical analysis was performed using SPSS package version 17.

**Results**

Only 246 women with breast cancer were included in the study, while 40 patients were lost. Four men with breast cancer were also excluded from the study. Only 25 patients (10.2%) died during the study. Table 1 shows the clinical characteristics of the breast cancer patients. The highest incidence of breast cancer (35.8%) was between the ages  $51 \geq 60$  years. The

presentation of cancer was high (90.1%) in the lumber. The tumor in the right side (66.35%) was significantly ( $p \geq 0.05$ ) higher than the left side. The metastasis was high (25%) and most of them in the liver (19.1%). The percentage of patients with positive estrogen, progesterone, and Her2/neu receptors were approximately the same as in the patients with negative receptors.

**Table (1): Clinical characteristics of the breast cancer patients**

Parameters	Initial samples (n = 246)	
	Number	%
Age (years)		
$20 \geq 30$	4	1.6 <sup>a</sup>
$31 \geq 40$	55	22.4 <sup>b</sup>
$41 \geq 50$	48	19.5 <sup>b</sup>
$51 \geq 60$	88	35.8 <sup>c</sup>
$61 \geq 70$	51	20.7 <sup>b</sup>
Presentation		
Lump	224	91.1
Mastalgia	3	1.2
Nipple discharge	9	3.7
Axillary LN	9	3.7
Distal metastasis	1	0.4
Tumor site		
Right	163	66.3 <sup>*</sup>
Left	83	33.7
Lymph node		
Positive	159	64.6 <sup>*</sup>
Negative	87	35.4
No Metastasis metastasis	183	74.4 <sup>a</sup>
Lung	9	3.7 <sup>c</sup>
Liver	47	19.1 <sup>b</sup>
Bone	7	2.8 <sup>c</sup>
Estrogen		
Positive	132	53.7
Negative	114	46.3
Progesterone		
Positive	131	53.3
Negative	115	46.7
Her-2/new		
Positive	121	49.2
Negative	125	50.8

\*  $p \geq 0.05$ , different letters mean significant at  $p \geq 0.05$

Cox regression analysis showed that metastasis had significant effect on death (hazard ratio=2.917). Age  $30 \geq 40$  years was the least age effect (hazard ratio=0.034). The age  $60 \geq 70$  years was considered the base age (Table 2). Estrogen, progesterone and Her2/neu were found not significant.

**Table (2): Hazard ratio for the age and other variance for patients with breast cancer (n=25)**

Parameters	Exp (B)	95% CI	Significant
Age (years)			
20 ≥ 30	0.25	0.00	NS
31 ≥ 40	0.034	0.003-0.367	0.01
41 ≥ 50	0.242	0.034-1.373	NS
51 ≥ 60	0.331	0.120-0.915	0.05
Lymph node	0.229	0.029-1.893	NS
Metastasis	2.917	1.801-4.731	0.001
Estrogen	3.476	0.293-41.175	NS
Progesterone	0.141	0.008-2.385	NS
Her2/neu	0.592	0.077-4.537	NS

Exp (B), hazard ratio; CI, confidence interval

## Discussion

This was a follow up study in Mosul, North of Iraq. The data were collected from one center; therefore, the finding could not be generalized. The survivals during the study were 89.8%. The percentage of survivals in Iran were (56%)<sup>[5]</sup> and (62%)<sup>[6]</sup> by 5-year survival study; however, these studies did not explain the management of the patients. In Canada, the percentages of survivals were 91% and 95% in community and teaching hospitals, respectively by 5-year survival study<sup>[7]</sup>. In Brazil, the survival rate for the breast cancer patients were 90.9% by 5-year study<sup>[8]</sup>. The average period of the present study was 36 months which was lower than the studied period in Iran or Canada that made difficult for comparison among the present results and the published results. The survivals, in the present study, were higher than that in Iran which could be due to many factors including treatments.

In the present study, the patients with right breast tumor were significantly higher than with left breast tumor. These results are consistent with other workers<sup>[9,10]</sup>. However, mammary carcinoma was more likely to arise in the left breast in the western world<sup>[10]</sup>. The reason of the increased risk in the left breast is unclear<sup>[12]</sup>. The risk of cancer was significantly higher in the un-suckled breast and that

breast-feeding might safeguard the suckled breast from cancer<sup>[13]</sup>. Finally, five-year survival patients with bilateral primary breast cancer were less than patients with unilateral primary breast cancer<sup>[14]</sup>.

The findings showed high incidence of lymph node positive, cox regression showed significant metastasis. Low education, embarrassment and shyness of the patients may elongate visit of the patient to the clinic. The early detection of the breast cancer in the developed country is due to educational programs. Training courses on breast cancer and breast self-examination screening program for women (vulnerable poor population) are necessary so as to change their beliefs and culture in order to promote this health behavior<sup>[15]</sup>.

In the present study, the frequency of expression of Her2/neu was higher than other studies<sup>[16,17]</sup>. The high frequency of Her2/neu had insignificant hazard ratio in the present work. In Japanese, high prevalence of Her2/neu overexpression in inflammatory breast cancer was not a prognostic factor<sup>[18]</sup>.

No significant difference between our positive and negative values for estrogen and progesterone. In United States positive values for estrogen and progesterone were highly significantly higher than negative values in breast cancer patients<sup>[19]</sup>.

Cox regression showed the age range  $30 \geq 40$  years was the least age affected by the breast cancer, while the age range  $50 \geq 60$  was highest age affected. The age range 50-60 years was the affected age in Latin America <sup>[20]</sup> and in France <sup>[21]</sup>. However, women with age range 40-64 years was the best survival rate for the breast cancer in eastern Mediterranean region <sup>[22]</sup>.

In conclusion, survival rate of breast cancer patients in Mosul, North of Iraq is high due to good management. The early detection of cancer is the best way for survival of the patients, by developing the educational programs.

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