

Breast Cancer Frequency Rate Shift toward Younger Age in IRAQ

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ABSTRACT

Breast cancer in Arab countries present at earlier age than in Western countries and early diagnosis may contribute to better treatment outcome.

Aim: To determine the frequency rate in different age groups.

Patients and methods: A total of 148 breast cancer cases included in the study. The analysis of variables performed with stratification of 10 years age interval.

Results: Age distribution of breast cancer indicated that 20.3% of cases were with age of ≤ 20 years and 14.9% were with age of 16-18 years. In addition more than half of cases [52.7%] were with age of less than 30 years. Furthermore, 79.7% of breast cancer cases were in women ≤ 40 years of age. Only 5.4% of cases were with age of > 45 years. Odd ratio confirmed a significant association between age and breast cancer development in our study cohort. The highest frequency was in women with age of 21-30 years, followed by those with age of 31-40 years. Age of women with breast cancer significantly influences the CEA and ER mean serum values whether the analysis performed on group or individual stratification. In addition, P53 mean serum level in women with breast cancer was significantly different when the analysis performed on individual stratification, however, non-significant differences was achieved between age group. The same pattern was demonstrated for CA 27-29 and PR.

Conclusion: Age at diagnosis was with two decades earlier than that in Western countries.

Keywords: Breast cancer, Pollution, Frequency, CA 15-3, CA 27-29, PR, ER, P53, CEA.

I. INTRODUCTION

Breast cancer is the most common cancer among women in Arab countries [1]. Breast cancer accounts for approximately 1/3 of the registered female cancers [2]. In a recent study Alwan reported a trend for breast carcinoma to affect younger age group [3]. The incidence of breast cancer in Iraqi women increased in the last two decades and forms one of the major threats to female health [4]. The age standardized incidence rate of breast cancer in Iraq was 31.1/100000, while it was 18.4 for Iran, 22.4 for Saudi Arabia, 23.0 for Syria, 28.3 for Turkey, 47.0 for Jordan, and 47.7 for Kuwait [5]. Al-Hashimi and Wang conducted incidence trends from 2000 to 2009 and included 23,792 cases reported that breast cancer in Iraqi women increased from 26.6 per

100000 in 2000 to 31.5 /100000 in 2009 [6]. Iraqi National Programs for early detection of breast cancer were developed in order to decrease morbidity and mortality of breast cancer [7]. Age at which breast cancer diagnosed is with important implications since cancer in younger age group is more aggressive [8, 9].

This study was conducted to determine the frequency rate of breast cancer in different age groups.

II. METHODS AND MATERIAL

Study population

Women with breast cancer were recruited from those attending Breast Cancer Clinic and private clinic in Erbil

Governorate from January 2014 to end of July 2015. Their age range from 16 to 86 years. A total of 148 were included and verbal informed consent taken from each woman participated in the study before enrolment. The research protocol was approved by the ethical committee of Tikrit University College of Science [TUCOS]. The data gathered using predesigned questionnaire and information's collected by direct interview of each participant.

Statistical Analysis

The results presented as mean \pm SD and frequency. For mean comparison of the means between groups, student t test and ANOVA were used. Chi square test was used to compare frequency difference between groups. Logistic regression line analysis was used to determine odd ration, while Recessive Operative Curve [ROC] was used to determine area under curve [AUC]. P value of <0.05 was considered as significant.

III. RESULTS AND DISCUSSION

Age distribution of breast cancer indicated that 20.3% of cases were with age of ≤ 20 years and 14.9% were with age of 16-18 years. In addition more than half of cases [52.7%] were with age of less than 30 years. Furthermore, 79.7% of breast cancer cases were in women ≤ 40 years of age. Only 5.4% of cases were with age of > 45 years, Table 1. Odd ratio confirmed a significant [OR=0.94, 95% CI=0.91-0.96; P=0.000] association between age and breast cancer development in our study cohort.

When analysis performed on individual stratification age incidences of breast cancer were significantly different [P <0.01], Table 1, the same pattern of significance was observed when cases stratified on 10 years age group interval, Table 2.

The highest frequency [48/148; 32.4%] was in women with age of 21-30 years, followed by those with age of 31-40 years [40/148; 27.0%]. The women with age of 16-20 years were with frequency rate of 20.3% [30/148 cases], while those with age of 41-50 years were with rate of 18.9% [28/148 cases]. Only 2 cases were with age of more than 50 years [1.4%], Table 2.

The mean serum level of CA 15-3 was not with significant difference in relation to age, whether the analysis performed on age group [F=0.61, P.0.05] stratification, Table 3, or individual [F=1.263, P >0.05] stratification, Table 4.

The CEA mean serum values in women with breast cancer were significantly different when the analysis performed on group [F=3.667, P=0.007], Table 4, or individual [F=2.324; P=0.001] stratification, Table 5.

The mean serum levels of CA 27-29 were not significantly [F=0.89, P >0.05] between the age groups, Table 4, however, there were significant differences [F=2.295; P=0.001] between individual values, Table 6. On individual stratification serum P53 values were significantly different [F=2.413; P=0.001], Table 4, while the mean serum values were not significantly different between age groups [F=0.878, P >0.05], Table 7.

ER mean serum levels significantly different between age groups [F=5.147; P=0.001], Table 8, and between individuals [F=2.413; P=0.001], Table 4. PR serum levels were significantly [F=4.038; P=0.000] different between individual cases in relation to their age, Table4. However, the mean serum values were not significantly [F=1.181; P >0.05] different between age groups, Table 9.

Table 1. Frequency Distribution of Breast Cancer Cases in Relation to Age

Age in	Year	Frequency	Valid Percent	Cumulative %
	16	2	1.4	1.4
	17	2	1.4	2.7
	18	18	12.2	14.9
	19	6	4.1	18.9
	20	2	1.4	20.3
	21	8	5.4	25.7
	22	4	2.7	28.4
	23	10	6.8	35.1
	24	6	4.1	39.2
	25	2	1.4	40.5
	26	4	2.7	43.2
	27	2	1.4	44.6
	28	10	6.8	51.4
	29	2	1.4	52.7
	31	2	1.4	54.1
	32	4	2.7	56.8
	34	8	5.4	62.2
	35	14	9.5	71.6

	36	4	2.7	74.3
	37	4	2.7	77.0
	38	2	1.4	78.4
	40	2	1.4	79.7
	41	8	5.4	85.1
	44	4	2.7	87.8
	45	10	6.8	94.6
	46	2	1.4	95.9
	48	4	2.7	98.6
	86	2	1.4	100.0
	Total	148	100.0	

Table 2. Frequency Distribution of Breast Cancer Cases in Relation to Age Group

Age group Year	Frequency	Percent
16 – 20	30	20.3
21 – 30	48	32.4
31 – 40	40	27.0
41 – 50	28	18.9
≥ 51	02	1.4
Total	148	100.0

P <0.01

Table 3. Age Influence on CA 15-3 Mean Serum Value in Women with Breast Carcinoma

Age group Year	Mean	Standard Deviation
16 – 20	46.70	18.05
21 – 30	44.67	15.63
31 – 40	48.20	25.89
41 – 50	41.04	16.47
≥ 51	45.00	15.00
Total	45.35	19.40

F=0.61; P>0.05

Table 4. Age Influence on Biomarkers in Women with Breast Cancer

Biomarker	F value	P value
CA 15-3	1.263	>0.05
CEA	2.324	0.001
CA 27-29	2.295	0.001
P 53	2.413	0.001
ER	2.413	0.001
PR	4.038	0.000

Table 5. Age Influence on CEA Mean Serum Value in Women with Breast Carcinoma

Age group Year	Mean	Standard Deviation
16 – 20	5.41	2.22
21 – 30	5.04	2.74
31 – 40	5.15	2.67
41 – 50	7.28	4.31
≥ 51	1.90	0.95
Total	5.53	3.09

F= 3.667; P=0.007

Table 6. Age Influence on CA 27-29 Mean Serum Value in Women with Breast Carcinoma

Age group Year	Mean	Standard Deviation
16 – 20	48.41	30.37
21 – 30	62.13	49.78
31 – 40	48.77	36.50
41 – 50	60.79	48.50
≥ 51	45.00	15.00
Total	55.26	42.46

F=0.888 ;P>0.05

Table 7. Age Influence on P 53 Mean Serum Value in Women with Breast Carcinoma

Age group Year	Mean	Standard Deviation
16 – 20	1396.5	1325.3
21 – 30	1418.7	1412.4
31 – 40	1564.2	1122.2
41 – 50	1111.1	1115.9
≥ 51	3500.0	565.68
Total	1380.9	1259.0

F=0.878; P>0.05

Table 8. Age Influence on ER Mean Serum Value in Women with Breast Carcinoma

Age group Year	Mean	Standard Deviation
16 – 20	28.96	25.82
21 – 30	33.05	34.68
31 – 40	20.36	27.51
41 – 50	29.17	29.50
≥ 51	115.00	7.07
Total	29.16	31.67

F=5.147; P=0.001

Table 9. Age Influence on PR Mean Serum Value in Women with Breast Carcinoma

Age group Year	Mean	Standard Deviation
16 – 20	4.44	0.36
21 – 30	3.54	0.31
31 – 40	14.22	4.79
41 – 50	5.58	0.47
≥ 51	14.00	1.67
Total	7.14	2.53

F=1.181; P>0.05

Discussion

The present study shows that the highest frequency of breast cancer was in women with age of 21-30 years, followed by those with age of 31-40 years. This trend of frequency rate in relation to age was inconsistent to that reported for Arab Countries and globally [3,6,8,10,11] as previous studies indicated that the highest incidence and frequency was in the women with age of 40 to 49 years. Cox et al [12] in a nested case control study conducted in Norway and included 399 women with breast cancer found that frequency rate of BC was in age of 65-69, then 60 to 64 years and 50 to 54 years. Hosseini et al [13] studied the Iranian national data from cancer registry for 6265 female breast cancer found that age specific incidence rate of breast cancer decreases after menopause. Our present study finding indicated that breast cancer reduced after menopause, however, the peak incidence in Iranian population was in age group of 50 -59, while our present study cases peak was in age group of 21 to 30 years. In contrast to this study finding the breast cancer in US continue to increase with lower slope after menopause [14].

In a comprehensive literature review of 28 articles on breast cancer in Arab countries reported high frequency of cases was in the age that range of 43-52 years [8]. Alwan [3] carried out a study on 721 breast cancer in women, who visited Main Referral Training Centre for Early Detection of Breast Tumors in the Medical City Teaching Hospital in Baghdad, and found the higher frequency was in the age of 40-49 years and the rate declined with age. In addition, a comparative study on breast cancer in samples from 3 Iraqi Governorate indicated that the high frequency of breast cancer was in age group of 40- 49 years for Hilla and Baghdad and 20-

39 years in Karballa [11], and the trend of frequency reduced with age.

A population based study of breast cancer in Kurdish cohort which includes 514 cases for the period 2008-2010 in Sulaimaniyah, Iraq, found that higher frequency was in the age range of 20-49 years and subsequently reduced with age [15].

A prospective case-control study was conducted in Nanakaly Oncology Hospital in Erbil, Iraq for the period September 2009 to April 2011, which included 300 breast cancer cases and indicated that 42.7% were premenopausal [16].

A study conducted in Basra, Iraq, which included 67 breast cancer cases shows that 55.2% are with age of less than 47 years [17]. However, 28.7% of 130 women with breast cancer were with age group of 40 – 49 and 50-59 years in sample from Baghdad Governorate [18]. In addition, in Saudi Arabia the breast cancer that developed before the age of 40 years accounted for 26.4%, while it was 6.5% in USA [10] and 79.7% in the present study.

In two studies reported for Kirkuk shoe that breast cancer was most common in age group 41-50 years in that conducted from October 2012 TO December 2013 which included 138 cases [19] and the age group 51-60 years in that conducted from December 2013 to May 2013 which included 100 cases [20]. In addition, other previously reported studies in Iraqi community indicated that age peak frequencies occurred in fifth decade of life [21-27], while in Asian countries the age peak frequency was in 40-50 years and it was 60-70 years in Western countries [28].

The mean age of women with breast cancer who included in the present study was 30.6 ± 11.5 years which is not consistent to previous studies reported for Iraq, other Arab countries and globally. The lower mean age reported in literature was 41.7 years [29] in a study conducted in Baghdad which included 70 cases, while the higher mean age was 52 years which was a national large scale research (23,792 cases)[6]. In addition, in Basrah, one study reported mean age of 47 years which included 216 cases [17], while Majid et al [15] reported a mean age of 47.8 years and 49.5 years in two studied cohort in Northern Iraq for the period 2008-2010.

In Arab countries the weighted average age at diagnosis of breast cancer derived from 26 articles (7455 cases, 1985-2008) was 49.8 years [8]. The mean age at diagnosis of breast cancer was 50.1 years for Jordan [30], 47 to 48.6 years for Saudi Arabia [31-33], 46 years for Libya [34], 43.4 to 49.3 years for Iran [35-37]. However, the mean age at diagnosis of women breast cancer in UK, Canada, Australia, Denmark, Sweden, Norway, 1995-2007, was 62.5 years with a range of 60.6 to 63.9 years [38]. Collectively from the above data, the mean age at diagnosis of breast cancer cases was 41.7 to 52 years for Iraqi population studies, while it was 43 to 52 years in Arab countries, 43.4 to 49.3 years in Iran and 60.6 to 63.9 years in Western countries. Thus the mean age at diagnosis of breast cancer in Arab countries appears to be a decade earlier than in America and Western countries [8, 39]. However, the present study suggest that age at diagnosis appears to be a decade earlier than previous studies findings for Arab countries and two decade earlier than Western countries. This finding needs to be evaluated on a large scale national study to confirm such finding because it was with impact on Iraqi women health and disease control and prevention.

Unfortunately, the women with age of 16-20 years were with frequency rate of 20.3%, while those with age of 41-50 years were with rate of 18.9%. This finding suggests a shift in age breast cancer development and need to start screening at earlier age in Iraqi community. The high frequency rate of breast carcinoma in women with age of 20 years and below was not consistent with that reported for Iraq [3, 11, 15, 17, 18, 19] and Iran [13].

In this study odd ratio confirmed a significant association between age and breast cancer and the age frequency of breast cancer was 20.3% in 15-20 years of age and increased to reach the peak at age of 21-30 years and declined with age. This finding was consistent with that reported for Iraq and Iran but not of USA as the frequency steady increased with age [13]. The significant association between age and breast cancer was demonstrated whether the stratification performed on individual or 10 years age intervals.

In the present study 79.7% of breast cancer cases were in women ≤ 40 years of age and this frequency rate was higher to that reported for Arab and Western countries. In Iraq, a review for the period 2000 -2009 shows that 52.69-58.49% of breast cancer diagnosed before the age

of 50 years [6]. However, in Hilla, Iraq, 71.3% of breast cancer cases were diagnosed at age of less than fifty years [11], in addition, a review for Arab countries found that 65.5% of breast cancer cases were diagnosed before the age of 50 [8]. Furthermore, 55.2% of breast cancer in Basrah city was diagnosed before the age of 47 years [17], while 60.5% was reported for Sulaimaniyah in a study that included Arabic and Kurdish women [15]. Lafta et al [18] found that 47.3% of breast cancer in Baghdad were diagnosed before age of 50, while two studies performed in Baghdad by the same research group reported 42.3% , 2008-2009 [11] and 54.1%, 2004-2008 [3], and two studies in Kirkuk reported a rate of 58% ,2013 [19], and 38.4% [20].

Thus the present study shows higher frequency rate of breast cancer diagnosis before the age of 50, which is higher to those observed in Sudan 74% [40 Elgaili 2010], Libya 71% [34], Yemen 70% [41], Qatar 59.7% [40], Saudi Arabia 50-58.8% [42,43 Sadat], UAE 56.7% [42], Oman (53.2%) and Bahrain (53.9%)[42,Al-Madouj et al 2011],

Kuwait 47.5% [42], Jordan 44.5 – 47.2% [30,44], Lebanon 40% [45] and Iran 67.5% [35]. Our present study finding was much higher than those reported for USA 20.9% [46], France 23.35% [47], England 20% [48], and Australia 23.6% [49]. In addition, El Saghir et al [1] suggest that women with breast cancer were with age around fifty at the time of diagnosis in developing and Arab countries.

The high proportion of younger age at diagnosis in the present study was higher to that reported in studies in developing and Arab countries and much higher to that reported for Western countries. This could be due to that higher proportion of women with age of less than 50 years in Arab and developing countries [6]. In Iraq, the proportion of women with age of less than fifty was 82% while it was 56% in UK [50]. In addition, the population at risk in UK was stable, while it is increasing steeply in Iraq [6]. Environmental pollution including depleted uranium after 1991 and 2003 Gulf war may increase the risk for development of breast cancer [51-56]

Age of women with breast cancer significantly influences the CEA and ER mean serum values whether the analysis performed on group or individual stratification. In addition, P53 mean serum level in

women with breast cancer was significantly different when the analysis performed on individual stratification, however, non-significant differences was achieved between age group. The same pattern was demonstrated for CA 27-29 and PR. Despite the multiple risk factors for development of breast cancer, age per se still being advocated as an independent role player in the prognosis [57]. Thus circulating biomarkers quantitative and qualitative difference relative to age may be of value in monitoring breast cancer in variable age groups. A recent study performed in Kirkuk [20] shows that serum breast cancer biomarkers are with association to patient's age at time of diagnosis and stratification according to 5 years interval is with different trends of association. Circulating estrogen and progesterone receptors are more in older age women with breast cancer compared to younger and this finding was in agreement to that reported by other [20, 58-61] and contrast to the finding of Morrison et al [59].

IV. CONCLUSION

In conclusion, the present study shows a new trend of breast cancer frequency rate distribution as 20.3% of cases were with age of ≤ 20 years and 14.9% were with age of 16-18 years. In addition more than half of cases [52.7%] were with age of less than 30 years. This finding contributes to reduce the breast cancer screening age in Iraqi community.

V. REFERENCES

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