Invasive Ductal Carcinoma in Iraqi Women is The Most Frequent Breast Cancer

Eqbal A. Gatea 1* & Khalid M. Salih 1

eq25515@gmail.com,　khalidsalih.1961@gmail.com

1 Department of Biology, College of Science, Mustansiriyah University, Iraq.

Corresponding author email: eq25515@gmail.com

Abstract

Breast cancer (BC) is a commonest disease that causes death among women worldwide, the current study was designed to identify the different types of BC and find out the most common type. The pathological and medical data were collected from the medical profile of 1497 patients diagnosed with BC from January 2011 to December 2022. The results showed a significant increase in the number of BC cases from 46 in 2011 up to 149 in 2022. The mean ± standard deviation of BC cases significantly increased from (77.1 ± 22.8) case/year in (2011- 2017) up to (191.4 ± 34.1) case/year in the later five years (2018 – 2022). Out of 1497 cases of BC, 1343 case (89.7%) of them with ductal carcinoma, 86 case (5.7%) lobular carcinoma, 17 case (1.1%) metaplastic carcinoma, 17 case (1.1%) paget's disease, 15 case (1%) phylloids tumor, 14 case (0.9%) mucinous carcinoma, and 5 cases (0.4%) sarcoma.The average age of all patients is (51.2 ± 12.1) years with non significant difference between those with different types of BC and in the age intervals of BC patients, the majority of them (84.6%) at age interval ≥ 40 year in comparison with 15.4% at young age interval (20 – 39). Statistical analysis of BC patients based on their menopause status reveals that (50.2%) are premenopausal and (49.8%) are postmenopausal, and there is no significant difference between patients with different types of BC.

Keyword: Breast cancer types, invasive ductal carcinoma, premenopausal, postmenopausal.

1. Introduction

Breast cancer (BC) is considered the second main cause of cancer related mortality among women around the world, as one woman from three women is at risk of developing breast cancer during her lifetime, and this makes breast cancer the main cause of cancer worldwide (Tong et al., 2018; Saleh et al., 2020; Sivaganesh et al., 2021). In the year 2022, about 2.3 million women around the world were confirmed to have breast cancer and 670,000 deaths worldwide. Invasive ductal carcinoma (IDC) is considered the most prevalent type of breast cancer accounting for 50 to 80 % of all types of breast cancer (Henry et al., 2019). In Iraq, BC is the most prevalent malignancy among women accounting for about one third of all registered cancer cases among women, and it is considered the second leading cause of death after cardiovascular disease, while its incidence was increased from 52 case per 100,000 women in 2000 up to 91.66 per 100,000 in 2019 (Alwan, 2010; Iraqi Cancer Board, 2019; Alrawi, 2022). Breast cancer is a cancer that originates from breast tissues, usually from the mammary ducts or lobules cells. This disease is characterized by the uncontrolled proliferation of aberrant cells in the breast. These cells can infiltrate nearby tissues and can metastasize to distant body parts (Bertos and Park, 2011). Cancer that arises from the ducts is known

as ducal carcinoma. in general, breast carcinoma is subdivided into invasive ductal carcinoma and ductal carcinoma in situ (DCIS). infiltrating or invasive ductal carcinoma (IDC) refers to the abnormal (malignant) proliferation of neoplastic breast cells that penetrate the wall of the duct to the stroma (Vinay et al., 2005). Due to the worsening of this disease, women must be aware of the importance of regular examination for early detection of breast cancer and follow appropriate treatment methods until recovery occurs, thus reducing deaths (Salih and Kamil, 2018; Alrawi, 2022). Therefore, this study was conducted to identify the different types of breast cancer and find out the most common type.

2. Methods:

This study is a retrospective study in which data were obtained from the medical profiles of the National Center for Teaching Laboratories, Oncology Teaching Hospital of Medical City, and teaching hospital in Kut, where pathological and medical data were collected from the medical profile of 1497 patients diagnosed with breast cancer for the last eleven years from January 2011 to December 2022, to determine the different types of breast cancer and find out the most common type.

Pathological and medical data of all cases included: age, tumor type, clinical stage of disease (according toTNM staging system) (Greene et al., 2002), tumor grade (according to Nottingham Bloom-Richardson) (Van Dooijeweert et al., 2022), possibility of disease recurrence, and presence of distant metastases and, any other information recorded. The ethics committee of College of Science, Mustansiriyah University approved this work (Ref. No.: BCSMU/0822/00018Z).

2.1 Statistical analysis:

The Vassar Stats Web Site for Statistical Computation is used for statistical results analysis (Lowry, 2014). The measurable data were reported as mean standard deviation (M±SD), and the difference between two independent groups was statistically evaluated using the t-test.

3. Results and discussion:

For statistical analysis, 1497 medical profiles of Iraqi women with breast cancer have been checked in teaching laboratories/ medical city, oncology hospital/ medical city, and teaching hospital in Kut from January 2011 to December 2022.

Figure 3-1 shows significant increasing in the number of BC cases from 46 in 2011 up to 149 in 2022 (R^2 = 0.705, P < 0.0001). The mean ± standard deviation of BC cases significantly increased from 77.1 ± 22.8 case/year in the years (2011- 2017) up to 191.4 ± 34.1 case/year in the later five years (2018 – 2022).
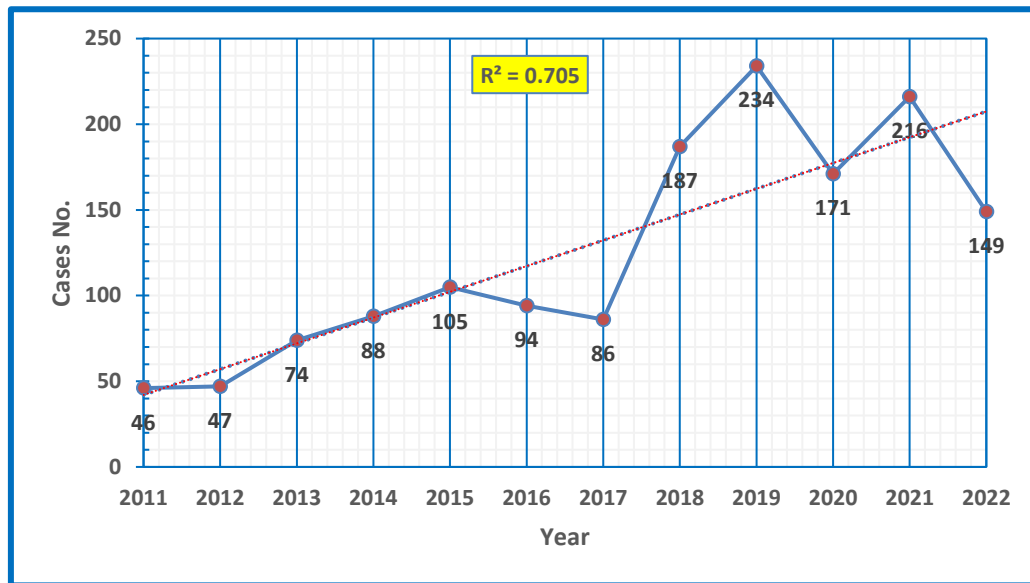
Figure 3-1: Number of breast cancer cases in different years

BC is the most prevalent cancer worldwide and the main cause of malignancy related deaths in women. The incidence of breast cancer is increasing worldwide. Some of these increases may be due to improved diagnosis, but some may also be due to changes in women fertility and lifestyle patterns, especially in less developed countries (Ali et al., 2020; Arzanova and Mayrovitz, 2022). A recent study conducted in 2023 to estimate the global burden of breast cancer over twenty years showed an overall increase of (1.28) times, with the incidence rate rising from 876,990 cases in 1990 to 2,002,350 cases in 2019 (Xu et al., 2023). Breast cancer incidence rates in the United States also increased by 0.5% per year from (2010 to 2019) (Giaquinto et al., 2022).

The highest rates recorded in developed countries were (95.5 / 100,000) in New Zealand and Australia, (90.7 / 100,000) in Western Europe (Sung et al., 2021). Among the Eastern Mediterranean countries, the highest rates were recorded in Lebanon (68.9 / 100,000) in 2011-2019. Incidence rates were moderate in Kuwait (45.8/100,000), Jordan (44.9100,000), Qatar (46.6100,000), and Bahrain (46.2/100,000), while the lowest incidence rate was in Syria (24.0/100,000) (Zahedi et al., 2020)

In Iraq, a study conducted during 2000 – 2015 showed an increase of 2.86-fold, where the number of breast cancer cases increased from (1,653) in 2000 to (4,720) in 2015, equivalent to a 2.86-fold increase (Al-Hashimi and Rashed, 2021). Another study showed that the incidence of breast cancer was (8.43) in 2000, rising to (8.56) per 100,000 in 2008 and to 13.19 in 2016 (Hussain and Lafta, 2021).

Out of 1497 cases of breast cancer, 1343 case (89.7%) of them have been presented with ductal carcinoma (DC), 86 case (5.7%) lobular carcinoma (LC), 17 case (1.1%) metaplastic carcinoma, 17 case (1.1%) paget's disease, 15 case (1%) phylloids tumor, 14 case (0.9%) mucinous carcinoma, and 5 cases (0.4%) sarcoma (figure 3-2).
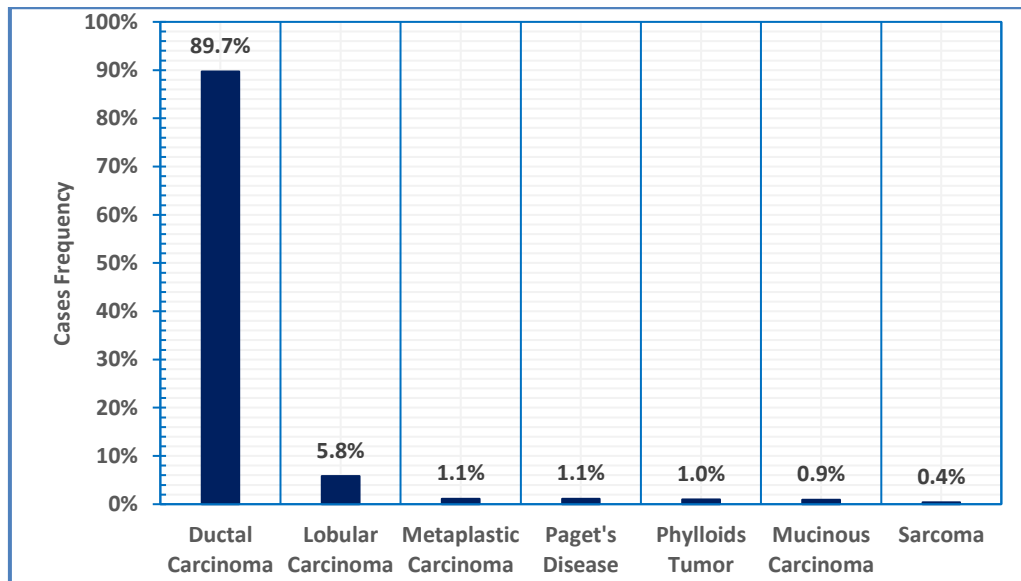
Figure 3-2: Frequency of cases based on the type of breast cancer

The results of the current study agreed with the results of Cormedi et al. (2018). where it was found that 86.112% of invasive ductal carcinoma, 2.81% of ductal carcinoma in situ, and 1.82% of lobular carcinoma in Latin America women. In a cohort study, (73) % of ductal carcinoma cases, (15) % of lobular carcinoma cases, and (12) % of residual histological types were found in United States (Bilani et al., 2020). The results of current study are similar to survey findings conducted by Mubarak et al. (2024) from 2004 to 2019, where it was found that 78.28% of patients had ductal carcinoma and 21.71% had lobular carcinoma. In a study conducted on Iraqi female patients, the majority of BC cases (92.8%) were invasive breast cancer, where invasive ductal carcinoma (DIC) constituted 88.3%, 7.2% ductal carcinoma in situ, and 4.5% invasive lobular carcinoma (ILC) (Salih et al., 2015).

According to the age of BC patients, Table 3-1 shows that the average of age of all patients is 51.2 ± 12.1 year and with non-significant difference between those with different types of breast cancer. Similarly, there is no significant difference in the age intervals of BC patients and the majority of them (84.6%) were presented at age interval ≥ 40 year in comparison with 15.4% of them who are presented at young age interval (20 – 39 year).

Table 3-1: Distribution of BC patients according to their age

Age (year)		Types of BC			Tota types (n=1497)	P value
		DC (n=1343)	LC (n=86)	Other types (n=68)		
M ± SD		51.4 ± 12.1	50.7 ± 12.2	49.3 ± 12.6	51.2 ± 12.1	0.350
Interval (n, %)	20 – 29	22 (1.6%)	3 (3.5%)	4 (5.9%)	29 (1.9%)	0.403
	30 – 39	184 (13.7%)	10 (11.6%)	7 (10.3%)	201 (13.5%)	
	40 - 49	393 (29.3%)	26 (30.2%)	21 (30.9%)	440 (29.4%)	
	50 – 59	383 (28.5%)	24 (27.9%)	20 (29.4%)	427 (28.5%)	
	≥ 60	361 (26.9%)	23 (26.8%)	16 (23.5%)	400 (26.7%)	
M ± SD: Mean ± standard deviation; DC: Ductal carcinoma; LC: Lobular carcinoma						

From the table above, it can be concluded that women aged ≥ 40 years are at risk of infection and that there is no significant difference in age between the different types of breast cancer. Similar studies showed that the highest incidence of breast cancer occurred in the age groups 40-49 (Shamshirian et al., 2020; Dolatkhah et al., 2020), and

this is consistent with the results of the current study. In the United States, breast cancer rates decrease in women under the age of 40. About (4 %) of women under age of 40 years of age have breast cancer (American Cancer Society, 2022).

Reports indicate that further than (55 to 75 %) of Arab women before the age of 50 are diagnosed with breast cancer compared to only (30 %) of women in Western countries (Chahine et al., 2015; Albeshan et al., 2018). In Jordan, about 53.7% of patients diagnosed with Breast Cancer are at age over fifty year (Mousa et al., 2021). In Saudi Arabia, women over the age of 40 were at greater risk of breast cancer (Razik et al., 2021). Studies conducted on Iraqi women showed that the highest incidence of breast cancer was among those aged $\geq$ 40 years, and this may be due to lifestyle, including weight gain, physical in activity, hormonal factors, and dietary change (Majid et al., 2017; Alwan et al., 2019; Jarallah et al., 2023). A study on Iraqi women found that Women aged ($\geq$ 60) years are more susceptible to developing breast cancer as the risk increases with increasing age (Abedalrahman et al., 2019).

Cancer is an age-linked diseases, and it has been proven that the risk of developing it increases with age (Nolen et al., 2017). Research shows that the tissue transformation into a malignant tumor needs age-related changes in the tissue or cellular micro-environment, such as a reduction in immune functions or increased inflammations that lead to the selection of mutations that promote proliferation and spread of transformed cells (DeGregori, 2013).

Moreover, statistical analysis of BC patients based on their menopause status reveals that about half of BC patients (50.2%) are premenopausal and the other half of them (49.8%) are postmenopausal, and there is no significant difference between patients with different types of breast cancer (Figure 3-3).
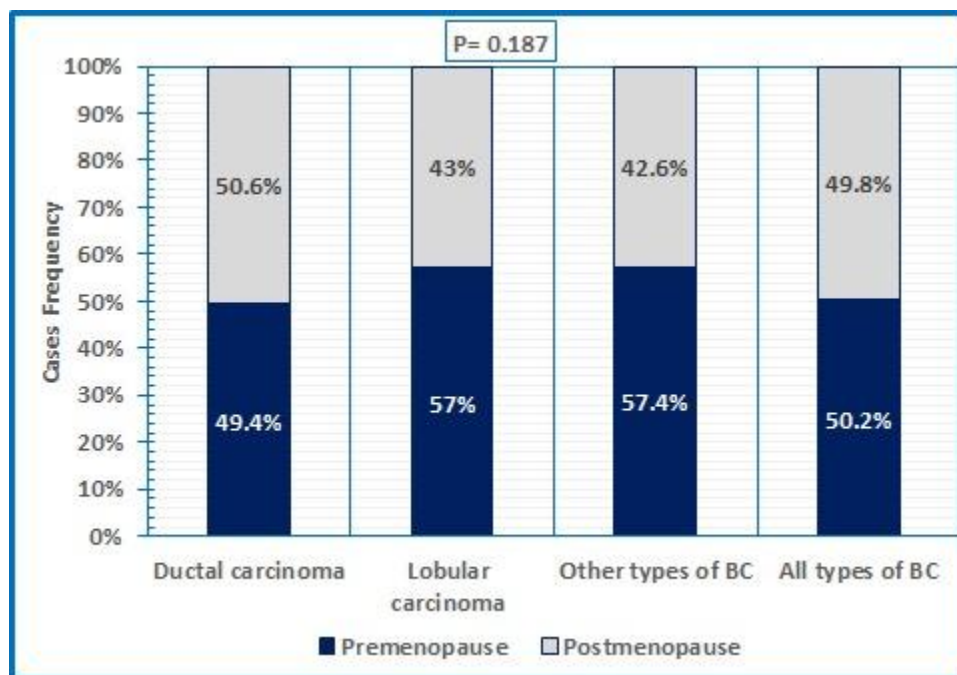

Figure 3-3: Frequency of pre- and postmenopausal cases in patients with

different types of breast cancer

The above table shows that there is a slight, non-significant increase in premenopausal women compared to postmenopausal women. A study similar to our current results showed that premenopausal women are more likely to develop breast cancer compared to postmenopausal women of the same age (45 to 54) years (CGHFBC, 2012). Inconsistent findings have shown that breast cancer incidence is slightly higher in postmenopausal women than in

premenopausal women (Surakasula et al., 2014). Breast cancer risk increases by approximately 50 % in women after menopause (Engmann et al., 2017).

Countries with a low Human Development Index (HDI) have a major burden of (premenopausal) breast cancer in new cases and mortality than high-income countries. While countries with a very-high (HDI) have higher incidence rates of perimenopause and postmenopause, countries with a low (HDI) and an intermediate (HDI) have higher rates of mortality in perimenopause and postmenopause, and the burden of postmenopausal and postmenopausal breast cancer has increased in under transition countries (Heer et al., 2020).

4. Conclusion:

We conclude that the incidence rate of breast cancer of all types among Iraqi women is constantly increasing and that the highest incidence rate is the invasive ductal type.

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