The Incidence of Breast Cancer in Examined Biopsies of Breast Masses in Al-Hussain Teaching Hospital in Kerbala

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Abstract

Background   Breast cancer is the most common type of malignancy among females worldwide. Breast cancer is the second most commonly diagnosed cancer in women under 35 years with the most common hitological type being infiltrative ductal carcinoma.

Objective   To determine the incidence of breast cancer in excised breast biopsy specimen in Al-Hussain Teaching Hospital in Kerbala governorate as well as determining the most prevalent histopathological type, pathological stage and grade at time of diagnosis.

Methods   It was a statistical study in which a total of 200 excised biopsy and mastectomy specimens where enrolled in the study, biopsy processing and slide preparation from paraffin blocks was processed in the pathology laboratory in Al-Hussain teaching hospital in Kerbala from January 2011 – January 2012.

Results   Out of 200 cases who were initially enrolled in the study, 140 (70%) were benign, and 60 (30%) were malignant. The highest incidence of breast cancer was found among 40-49 years age and ductal carcinoma is the most common histological type.

Conclusions   Breast cancer accounts for about 30% from all excused biopsy materials in Al-Hussain Teaching Hospital in Kerbala. This study highlights some of the features of breast cancer seen in this region; younger age, intermediate stage at presentation, and higher incidence in housewives. In contrast to data from the West, where more than half of breast cancer patients are above 50 years of age and higher incidence among high socioeconomic group.

Key words   Breast cancer, lesions, histopathology, incidence, percent.

List of abbreviation: BC = breast cancer, FNA = fine needle aspiration

Introduction

Breast cancer (BC) is the most common type of malignancy among females worldwide and about 1.38 million women are diagnosed with BC annually accounting for about a tenth (10.9%) of all new cancer cases and nearly a quarter (23%) of all female cancers [1,2]. BC is the second most commonly diagnosed cancer in women under 35 years with the most common histological type being infiltrative ductal carcinoma [3,4].

The incidence of BC differ between different socioeconomic groups with highest rates for the most affluent group [2,3]. In Iraq, BC is more common in housewives [4]. Its incidence has been increasing for many years in economically developed countries [5].

BC risk is strongly related to age, with 81% of cases occurring in women aged 50 years and over and nearly half of cases are diagnosed in the 50-69 age groups [6].

More than 50% of total BC diagnosed annually is found in premenopausal women, creating the need to initiate BC screening programs in this

population and one of these measures include breast self examination [7].

Retrospective demographic regional studies have shown that most patients with BC present for the first time at stages two to three [8,9]. Regarding education, 31.7% are illiterate and only 10% graduated from college so, it is lowest among college learning women [10].

Recent steep rise in incidence rates for women aged 60-69 years is almost certainly caused by the introduction of national BC screening programs for this age group. Although the incidence of BC is rising worldwide, but still the overall 5 years survival rates are over 80% [11].

The aim of the study is to determine the incidence of BC in excised breast biopsy specimen in Al-Hussain Teaching Hospital in Karbala governorate as well as determining the most prevalent histopathological type, pathological stage and grade at time of diagnosis.

Methods

This study includes a total of 200 excised biopsy and mastectomy specimens were enrolled in the study, these specimens were collected from Histopathological Laboratory in Al-Hussain Teaching Hospital, and biopsy processing and slide preparation from paraffin blocks was processed in Al-Hussain Teaching Hospital from January 2011 to January 2012. Slides were carefully examined and the histopathological type and grade were determined on all excised biopsy materials. Most cases were diagnosed by fine needle aspiration (FNA) before excisional biopsy and mastectomy.

We did staging for cases operated for carcinoma of breast by mastectomy (staging for mastectomy specimens only), which were either diagnosed by FNA or excisional biopsy, we exclude from staging cases with excisional biopsy only.

Tumor grade is the description of a tumor based on how abnormal the tumor cells and the tumor tissue look under a microscope. It is an indicator of how quickly a tumor is likely to grow and spread.

We use the Nottingham grading system (also called the Elston-Ellis modification of the Scarff-Bloom-Richardson grading system) for breast cancer [12].

Staging describes the extent or severity of a patient's cancer. Knowing the stage of disease helps the doctor to plan the treatment and estimate the patient's prognosis.

TNM staging system was used and is based on the size (T), regional lymph nodes metastasis (N), and distant metastasis (M).

We did different radiographic examination including chest x-ray and abdominal ultrasound and liver function test to detect presence or absence of distant metastasis.

Histopathological Technique

- Fixation: in 4% formaldehyde in buffered isotonic saline.
- Dehydration: A graded series of mixtures of water and ethanol are use, 50%-70% to 100% ethanol for 2 hours each.
- Embedding: two changes of 100% paraffin in an oven at 58-60 °C.
- The first paraffin bath lasts for 2 hours; the second one is 3 hours.
- Tissue Embedding.
- Next; the tissue is oriented and embed in a paraffin block.
- Block is placed in ice water to solidify.
- Sectioning with a microtome, serial sections form a ribbon
- Mounting: The slides are placed on a warming tray and distilled water is added to float the paraffin sections and allow them to expand and straighten out
- Staining
1) Slides with paraffin sections on them must have the paraffin removed for staining.
2) Place slides in xylene for 10 minutes.
3) Next a second change of xylene for 10 minutes.
4) Slides are then rehydrated through a grades series of alcohols to distilled water.
5) The slides are then placed in hematoxylin for 3 to 5 minutes.
6) Then rinsed in water.

7) Slides stained with eosin for 1-2 minutes.
8) Then rinsed in water.
9) Next rehydrated in graded alcohol
10) Next cleared in xylene
11) A small drop of mounting medium was added to the slide and finally add a cover slip.

Results

Out of 200 cases who were initially enrolled in the study, 140 were benign (70%), and 60 were malignant 30%. Table 1 shows the age distribution for patients involved by BC, the highest incidence was found among 40-49 years age group and the lowest incidence was for the 20-29 years age group.

Table 1. Incidence of breast cancer according to age

Age group (years)	Number of cases	%
20-29	2	3.3
30-39	12	20
40-49	26	43
50-59	12	20
60-69	4	6.6
70-79	4	6.6
Total	60	100

The most common histopathological type of BC was ductal carcinoma which constitutes about 83.3% of the cases (50 case) followed by lobular carcinoma 10% (6 cases), medullary carcinoma 3.3 % (2 cases), tubular carcinoma 1.6% (1 case), and mucinous carcinoma 1.6% (1 case) as seen in table 2.

Table . Breast cancer distribution according to histological type

Histological type	No. of cases	%
Ductal carcinoma	50	83.3
Lobular carcinoma	6	10
Medullary carcinoma	2	3.3
Tubular carcinoma	1	1.6
Mucinous carcinoma	1	1.6
Total	60	100

Figures 1 through 6 showed different histopathological type of BC.
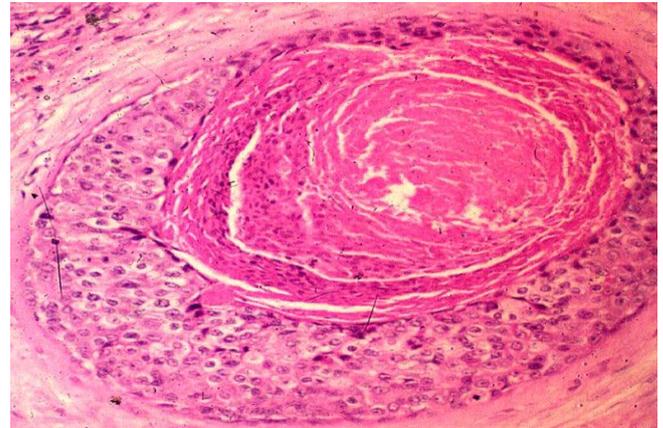

Fig. 1. Ductal carcinoma in situ (Comedocarcinoma)
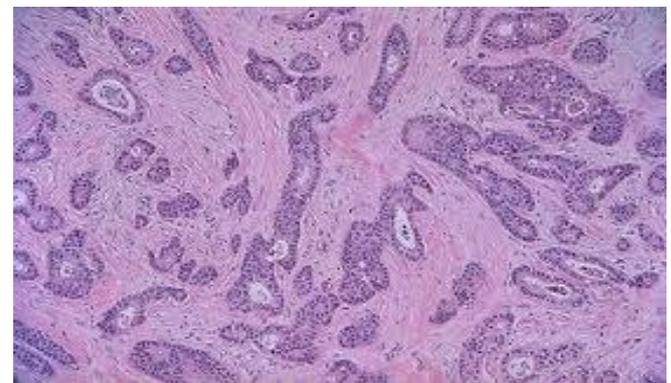

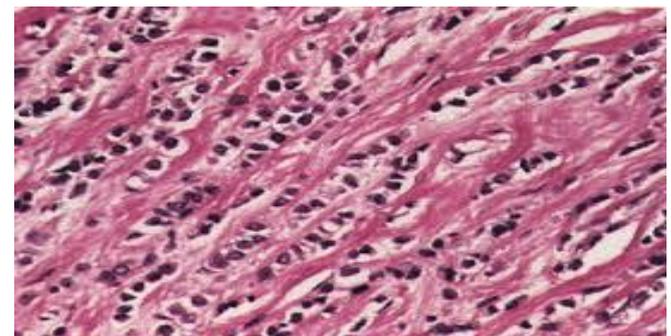**Fig. 2. Infiltrative ductal carcinoma**

Fig. 3. Infiltrative lobular carcinoma

Staging was carried out on all malignant cases submitted for modified radical mastectomy most patients presented in stage II of the disease (20/40 cases, 50%) followed by stage III (25%) of the cases, 5% of cases were in situ ductal carcinoma, and 5% were stage IV of the disease, as shown in table 3.
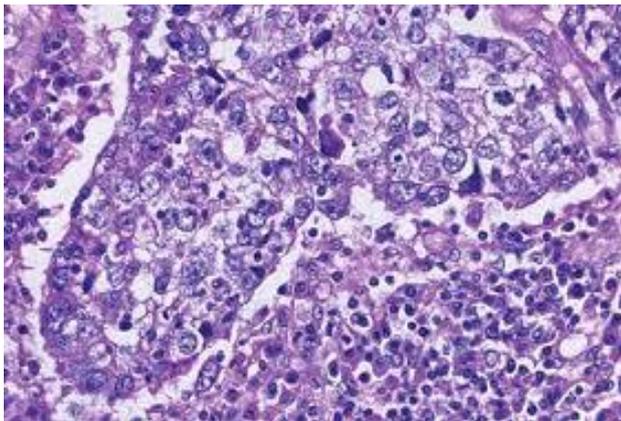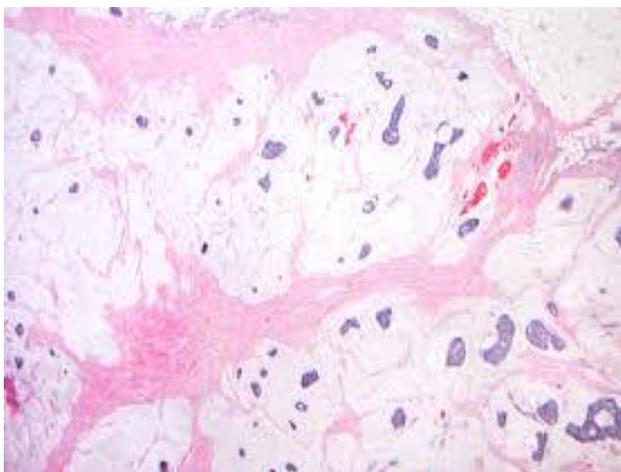
Fig. 4. Medullary carcinoma
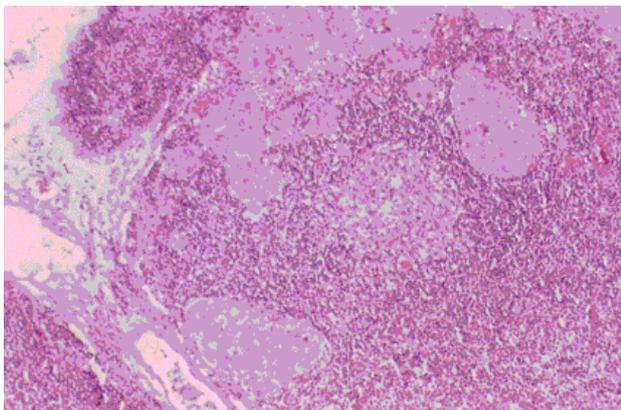

Fig. 5. Mucinous carcinoma

Fig. 6. Metastatic mammary carcinoma (Lymph Node)

Grading was done on all malignant cases (excisional biopsy and mastectomy specimen). The most predominant grade for infiltrative carcinoma of the breast was grade II (39/60 cases, 65%), because most tumors show

prominent glandular structures and intermediate degree of mitotic activity, followed by grade III (12/60 cases, 20%), followed by grade I (9 cases, 15%) as illustrated in table 4.we can see the age distribution with regards to histopathological type, stage and grad as shown in tables 5 through 7 respectively.

Table 3. Number and percent of cases according to stage

Stage	No. of cases	%
0	2	5
I	6	15
II	20	50
III	10	25
IV	2	5
Total	40	100

Table 4. Number of cases according to histological grade

Grade	No. of cases	%
I	9	15
II	39	65
III	12	20
Total	60	100

By applying T-test there was no significant association found between age and histological type, age and disease stage, age and tumor grade with a *P* value of 0.653, 0.339, 0.168 respectively.

In our study, 66% of patients had low level of education, 34% of malignant cases were graduated from college.

Discussion

It was estimated that 332,000 new cases diagnosed in the countries of European Union in 2008 [1].

The etiology of breast cancer is uncertain and adequate primary prevention is not possible [7].

The changes that have been noticed in the incidence and the age of presentation of breast

carcinoma in Iraq could be attributed only to the usual risk factors [4].

We believe that stressful life events might be more significant trigger for the development of breast cancer.

Table 5. Age distribution according to histological type

Age (yrs)	Histopathologic type				
	DC	LC	MC	TC	MuC
20-29	2	0	0	0	0
30-39	8	2	1	1	0
40-49	23	2	1	0	0
50-59	11	0	0	0	1
60-69	3	1	0	0	0
70-79	3	1	0	0	0

DC = ductal carcinoma, LC = lobular carcinoma, MC = medullary carcinoma, TC = tubular carcinoma, MuC = mucinous carcinoma

This study was done over a very stressful condition in Iraq, characterized by war and the disasters that occurred after the year 2003.

A study in China suggested that psychological stress is associated with increased oxidatant production and oxidant damage was found in breast tissue [13].

Table 6. Age distribution according to stage

Age (yrs)	Stage				
	0	I	II	III	IV
20-29	0	0	1	0	0
30-39	0	1	4	2	1
40-49	1	3	9	3	0
50-59	1	2	5	3	-
60-69	0	0	1	1	0
70-79	0	0	0	1	1

For age, the same finding of patients with breast cancer in this study tends to be in younger age group. It occurred in (56.3%) of patients before the age of 45 years. This tendency is similar to other study done in Jordan [14].

Peak frequency was recorded equally in the age categories 40-49 years; similar peak age frequencies were recorded in other reports from our country [4].

In this study, the peak incidence according to age group was under age of 50 years unlike in the United States of America where women aged 50 years and older are the most commonly affected, this is because of the population pyramid in these Middle East countries and then higher rates among younger age groups [2].

Table 6. Age distribution according to grade

Age (yrs)	Grade		
	GI	GII	GIII
20-29	0	1	1
30-39	1	9	2
40-49	4	18	4
50-59	2	7	3
60-69	1	3	0
70-79	2	1	1

In our study, the most prevalent stage at time of diagnosis was stage II (50%), while in other study in Iraq, they found that 47% of them presented with advanced stage breast cancer; either stage III or IV in a study carried out in Erbil in 2004 [4]. The relative early diagnosis might be related to increased education and awareness about breast cancer or might be related to decrease aggressiveness of the tumor, this is not like other study, in which, most patients presented in late stages of the disease when seeking medical advice, which is again similar to the above studies in the region. It is not well understood whether this delay in presentation is due to cultural and social customs or due to more aggressiveness of the disease in this part of the world [15].

Although low percent of carcinoma in situ, which is nearly same finding in other study [3], the patients in our study were relatively presented at low stage at time of diagnosis, this highlights increased community awareness about breast cancer and the need for early detection and screening programs including periodical mammography and periodical physical and breast self-examination.

Also in our study, the most predominant stage at time of presentation was stage II, which

accounts for about 50% of cases, and 83% were invasive ductal carcinoma which was similar to study of others [16].

In our study, most patients were housewives who lived in intermediate and low socioeconomic state, while in Europe it was found that breast cancer incidence is higher in the most affluent groups in society [1].

In conclusion, BC accounts for about 30% from all examined biopsies of breast in Al-Hussain Teaching Hospital in Karbala, most malignant cases diagnosed between 40-49 years 43%. The most common histological malignant type is ductal carcinoma (83.3%), 50% of malignant cases comes at pathological stage II, 65% of malignant cases diagnosed at histological grade II, there was no significant association was found between age and histological type, age and disease stage, age and tumor grade, and in our study most patient were housewives who lived in intermediate and low socioeconomic state.

Acknowledgment

Authors' contribution

Dr. Anees and Dr. Akram responsible for collection of cases and treatment and follow up of the patients, Dr. Fatin as a pathologist responsible for histopathological review of slides and reports, staging and grading of mastectomy specimen.

Conflict of Interest

No conflict of interest of any type in the work.

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