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Research Article

THE PREVALENCE OF BREAST DISEASES AT KING ABDULAZIZ UNIVERSITY HOSPITAL: SCREENING AND COST EFFECTIVENESS.

Fadwa J. Altaf¹, Ragad S. Jamal², Maryam H. Habib², Shahad J. Al-Aslany²

¹Professor of Pathology and Consultant Pathologist, Pathology department, Faculty of medicine, King Abdulaziz University. ²Medical students, Faculty of Medicine, King Abdulaziz University.

Abstract:

Objective : Our objective is to identify the pattern of breast diseases at our institution and compare the findings with similar studies from the region in order to determine if our population will benefit from early breast cancer detection programs and its cost effectiveness.

Introduction: Benign breast diseases are very common in comparison to the malignant counterpart. Proliferative, non-proliferative and carcinoma in situ categories are recognized to carry some risk to the patients harbouring them to develop invasive breast cancer.

Methods: All breast cases in the archive of the department of pathology from January 2010 till December 2013 were reviewed. Inclusion and exclusion criteria were identified.

Results: 1375 cases were identified, 398 were excluded. A total of 977 cases were included in the study, 963 cases were female (98.6%) and 14 male cases (1.4%). Benign diagnosis were 647(67%) of which non-proliferative diseases including , Fibrocystic changes, inflammatory changes and Fibroadenoma comprise 515 cases (53.5%) and Proliferative disease without atypia comprise 101 cases (10.4%), while Proliferative disease with atypia comprise 31 cases (3.2%). Carcinoma in situ were 113 cases (11.7%). The invasive malignancy cases were 448 (46.5%). 176 cases (18.1%) had more than one diagnosis in their biopsies. The benign to malignant ratio is 1.2:1 All male lesions were comprised of : Epithelial hyperplasia without atypia 1 case (7.1%), Fibrocystic changes 1 case (7.1%), Ductal carcinoma in situ 2 cases (14.3%), and Invasive ductal carcinoma 3 cases (21.4%). 9 cases had gynecomastia. The total combined diagnosis was 2 cases (14.2%).

Benign to malignant disease ratio is close. This finding is different from the literature and from other studies published in 2004 from the same institution. The increase of malignant diagnosis might be related to the hospital setup as a referral center for breast disease and the utilization of its facilities for screening and early detection

Corresponding author:

Fadwa J. Altaf,

Professor of Pathology and Consultant Pathologist,

Pathology department, Faculty of Medicine, King Abdulaziz University.

QR code



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INTRODUCTION:

Breast diseases are common health problems. They have been classified into benign and malignant. The benign category include, proliferative disease (PD) , and non-proliferative disease (NPD) based on the risk of subsequent breast cancer development .However the malignant types are non invasive (in situ) and invasive types [1].

Breast diseases PD and NPD histological types are many. It has been explored tremendously in western literature and it has a variable risk for developing breast cancer (Table I). Women with PD lesions and those specifically with atypia are at 4-5X increased risk for breast cancer development in comparison to the general population [2, 3].

It has been reported that PD will develop into invasive carcinomas in the same breast in less than 10% of patients based on their histological types [4, 5]. Therefore it is essential to identify the type of PD in breast cancer screening and treat them properly, or follow them up regularly before their progression to breast cancer [6].

In addition, the presence of carcinoma in situ (CIS) in the breast increases the incidence of invasive cancer X10 in the same breast as well as the contrary breast. Family history of first degree relatives with breast cancer will further double these risks [2,3].

In Saudi Arabia there are many studies that have reported this health problem in different regions of the Kingdom [7, 8, 9]. Jamal A, in 2000 looked at breast cases from King Abdulaziz university hospital (KAUH) from 1984-2000. She found that benign breast lesions were 57%, while malignant cases were 32.5% (benign diagnosis double malignant ones) [7]. Altaf et al in 2004 looked at benign breast diseases in KAUH and King Khalid National Guard hospital. They reported that 64% of their cases were benign while 24% were malignant (benign diagnosis is 2.7X the malignant diagnosis). Out of 1504 benign cases, they found that NPD diagnosis was much more common in comparison to the PD, 85% versus 9.3% [8].

Amine et al in their study from a period of 2001-2007 in the Hassa region of the kingdom, have found that benign breast lesions accounted for 60% of their cases (969), while malignant lesions were 21%(benign diagnosis is 3X the malignant ones)[9].

The objective of our study is to determine the pattern of breast diseases in KAUH and to compare our findings with the previous reports from the same

institution in order to determine if our population will benefit from early breast cancer detection programs. In addition, we would like to give an approximate cost of screening and treatment of the breast cancer cases.

MATERIAL AND METHODS:

A retrospective study was conducted at KAUH in Jeddah, Saudi Arabia from January 2010 to December 2013. A sample comprised of 1375 female and male patients was taken from the pathology department archives .The Inclusion criteria include all the excision and biopsy cases diagnosed at KAUH during that period .The exclusion criteria were cases with no significant pathological diagnosis, no breast lesions and duplicate cases with more than one biopsy/excision with similar diagnoses.

Our Data was analyzed by the Statistical Package for the Social Sciences (SPSS) version 20.0. A simple frequency analysis was done, as well as comparative and combined analysis between the cases.

RESULTS:

The total number of all the breast lesions that were collected from the Pathology laboratory archives were 1375 cases.

398 cases were excluded because they matched the exclusion criteria. 977 cases were included in the study of which 963 cases were female and 14 were male.

All the female breast cases were classified into 9 main categories (Table II). Some patients had more than one diagnosis in their biopsies 176 (18.1%) (Table III). In order to avoid duplication of the number of cases a total of 126 cases were subtracted from the total benign cases since they carried more than one benign diagnosis. In addition 126 cases were also found to have both malignant and benign diagnosis on the same specimens that were also subtracted from total malignant cases.

Therefore, the total benign diagnosis were 647 cases(67%) of which NPD including , Fibrocystic changes (FCC) , inflammatory changes and Fibroadenoma (FA) comprise 515 cases (53.5%) and PD without atypia comprise 101 cases (10.4%), while PD with atypia comprise 31 cases (3.2%).

The total carcinoma in situ (CIS) cases were 113 (11.7%). The invasive malignancy was 448 (46.5%). The benign to malignant ratio is 1.2:1.

All male lesions diagnoses were similarly categorized into 9 main categories (Table II). The total combined diagnoses were 2 cases (14.2%) that were excluded from the total percentage.

Table I: Proliferative breast lesions histological types & its risk of developing invasive breast cancer in comparison to the general population:

PD Histological type	Risk value	Non invasive Breast lesions	Risk value
Sclerosing Adenosis	1.5-2X	DCIS	10X
Moderate to florid hyperplasia	1.5-2X	LCIS	10X
Ductal papillomatosis	1.5-2X		
Fibroadenoma and Fibrocystic changes	1.5-2X		
Atypical ductal hyperplasia	5X		
Atypical lobular hyperplasia	5X		

Table II: The major categories of the breast lesions

Breast lesions	Female cases =963		Male cases=14	
	Number	Percentage	Number	Percentage
Inflammatory	96	10%	0	0%
EHWOA +	61	6.3%	1	7.1%
EHWA ++	21	2.2%	0	0%
FCC	223	23.2%	1	7.1%
FA	164	17%	0	0%
Other benign lesions	76	8.72%	0	0%
Total Benign diagnosis	(641-126)=515	53.5%	11	78.5%
DCIS*	86	8.9%	2	14.3%
LCIS **	8	0.8%	0	0%
IDC***	446	46.3%	3	21.4%
ILC ****	18	1.9%	0	0%
Other malignancies	16	1.6%	0	64.3%
Total malignant diagnosis	(574-126)=448	46.5%	5	35.7%
Total	963	100%	14	100%

+EHWOA: Epithelial hyperplasia without atypia

++EHWA: Epithelial hyperplasia with atypia

*DCIS: Ductal carcinoma in situ.

**LCIS: lobular carcinoma in situ

*** IDC: Invasive ductal carcinoma

**** ILC: Invasive lobular carcinoma

Table III: The major combined categories of the breast lesions

Combined diagnosis	Number of female cases	Percentage	Number of Male cases	Percentage
FCC + EHWOA	40	4%	0	0%
FCC + EHWA	10	1%	1	7.1%
Total Combined Benign	50	5.6%		
FCC + DCIS	19	2%	0	0%
FCC + IDC	40	4.2%	0	0%
IDC + EHWOA	13	1.3%	0	0%
IDC + EHWA	4	0.4%	0	0%
IDC + DCIS	50	5.2%	1	7.1%
Total Combined with Malignancy	126	13%		
Total	176	18.6%	2	14.2%

DISCUSSION:

Breast cancer is the most common cancer diagnosed in women worldwide and the united states of America. It is the second leading cause of death from cancer in US [10]. Breast cancer risk increases with age and with the presence of other PD, family history and genetic predisposition (Table IV).

Widespread adoption of screening programs raises breast cancer incidence in a given population thus it will increase the detection rate of cancer and detect cancer at an early stage of its development.

In addition it will also increment the incidence of PD, premalignant lesions, and CIS [11]. However, morbidity and mortality rates have been effectively reduced by early detection of breast cancer through screening activities [12, 13].

In the Arab world breast cancer incidence and mortality rates are increasing as the majority of cases were diagnosed at advanced stages, due to either the absence of breast cancer screening programs or low participation rates of Arab women in breast cancer screening activities [14].

The breast cancer incidence in our population is different from the developed and western countries, in that we have the highest overall percentages 38.6% and 31.2% of female breast cancer cases that were documented between 30–44 and 45–59 years of age,

respectively. Ezzat *et al* found out that early breast cancer (Stages I, II) represent 36% of all breast cancer cases, while 64% were metastatic disease (Stages III and IV)[15].

The majority of patients were premenopausal (64%) [16].

In another study, Ibrahim et al reported that patients with breast cancer below 50 years of age were 292 cases (78%) of their studied group, and they were predominantly pre-menopausal (79%). Only 25 (9%) had stage I cancer, while 130 (44%), 90 (30%) 47 (16%) had stage II, III and IV respectively [17].

The total cost of treatment of breast cancer per each case was assessed based on the stage at which the patient presented in. The cost is differently calculated in different regions in the world (Table V) [18].

If we adopt the previous report [15, 16, 17] regarding the prevalence of advanced breast cancer stages in our population and the fact that a high percentage of cases were premenopausal (less than 50), and then we looked at the cost of treatment of breast cancer patients, we found that the cost is less with advanced stages [19]. The increase of cost in early stages is partially related to the cost of screening as young age groups require more frequent screening during their lifetime. Therefore many experts believe that the benefits of screening, in terms of reducing

breast cancer mortality, out way the harms, whereas others think the opposite [20].

Currently, there are many efforts to encourage breast cancer screening in different institutions but no well established organized mass screening program has been established for all the female population at cancer risk age group.

Since our current data show that the ratio of benign to malignant diagnosis is 1.2:1, which is different from the literature and other previous reports from the same institution (KAUH) [7,8], We presume that the major factor of such change is that our hospital is a tertiary care center. It harbours highly qualified doctors from different specialties, and it is fully equipped for detection and treatment of breast cancer. Radiologists with the aids of digital image mammography and breast ultrasound in the department of radiology were accurate in early detection of breast cancer. There are also many adequate Surgeons treating breast cancer cases at

different stages of the disease process. Furthermore, pathologists are highly qualified and the laboratory is well equipped with immunostains for diagnosing all breast lesions. Oncologists and radiation oncologists are also very efficient in treatment of cancer patients. This setting promotes our hospital to become a referral centre for diagnosing and treatment of breast diseases and breast cancer, which may account for such change in the pattern of breast diseases.

In conclusion, we believe that breast disease is a very common health problem in our population. We encourage mass education to all females with breast cancer risk factors. Awareness with this health problem will be the first aid in managing it and adopting a healthy lifestyle and periodical check up with mammography or breast ultrasound after the age of 40 is recommended. Breast cancer screening programs should be introduced to the community with continuous monitoring and auditing until we establish the best diagnostic and cost effective measures for our population.

Table IV: Risk of breast cancer [11]

Current Age (in Years)	Risk in Next 10 Years	Lifetime Risk of a Breast Cancer Diagnosis
30	1 in 250	1 in 8
40	1 in 71	1 in 9
50	1 in 42	1 in 9
60	1 in 29	1 in 11
70	1 in 27	1 in 15

Table V: Cost of treatment of Breast Cancer per patient

Location	Stage 1	Stage 2	Stage 3	Stage 4	All stages
North America	\$ 24,008	\$18,304	\$ 10,475	\$ 12,421	\$ 8530
Africa	\$ 1829	\$ 1342	\$ 679	\$ 959	\$ 602
Asia	\$ 1188	\$ 863	\$ 426	\$ 630	\$ 356

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