RESEARCH ARTICLE

Various Aspects, Patterns and Risk Factors in Breast Cancer Patients of Balochistan

Abdul Hameed Baloch[1]*, Jameela Shuja[2], Shakeela Daud[3,4], Muneer Ahmed[2], Adeel Ahmad[5], Mehrullah Tareen[2], Farah Khan[2], Muhammad Azam Kakar[1], Dost Mohammad Baloch[1], Naseebullah Kakar[1], Hafiz Khush Naseeb[2], Jamil Ahmad[1]*

Abstract

Purpose: Breast cancer is the commonest malignancy of females throughout the world with one million new cases each year. In Pakistan, the burden of breast cancer disease is high with late stage presentation being a common feature, more than half being stage III or stage IV. The objective of this study was to study various aspects, patterns and risk factors in breast cancer patients of Balochistan. Method: Present study was performed on 134 patients of breast cancer who were registered in CENAR. The patients were interviewed by providing a questionnaire. Informed consent was taken from all the patients who took part in this study after explanation of the study aims. Body mass index (BMI) was calculated andbiopsy reports were obtained from patients files. All the cases were classified with respect to age, gender, ethnic group (Baloch, Pashtoon, Punjabi, Afghani, Hazara) BMI, cancer type, cancer grade, hormonal status, side of the cancer, fertility and marital status. Results: Out of 134 patients, the most common ethnic group was Pashtoon with a total of 42 and the common age group was 41-50 years with a total of 51. Invasive ductal carcinoma (IDC) was the most common type, accounting for in 128 patients (95.5%) followed by invasive lobular carcinoma (ILC). Conclusion: Pashtoon was the most common ethnic group, IDC was common type and most of the patients had an ER/PR positive hormonal status.

Keywords: Breast cancer - Balochistan - hereditary cancer - CENAR cancer registry

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Introduction

Breast cancer is the malignancy of the cells that constitute the breast tissue. Breast cancer is the common malignancy of females throughout the world with one million new cases each year and among females it is the second leading cause of death. All women regardless of their racial or ethnic origin or heritage are at risk of developing breast cancer (Naeem et al., 2008). The common form of the breast cancer is the ductal carcinoma (70-80%) originates from the ducts followed by lobular carcinoma (4-5%) originates from milk producing glands: the lobules (Ludwig, 2006; Meijers-Heijboer et al., 2008). In males the breast cancer is very rare, although they can also be affected (Mc Pherson et al., 2000; Ahmed et al., 2006; World Cancer Report, 2008).

Breast cancer is more common in Pakistan at a young age compared to the western population where it is common in old age (Mahmood et al., 2006). The annual rate of age standardized breast cancer in Pakistan is 69.1/100,000 (Mc Pherson et al., 2000; Banning et al., 2009). In Pakistan, the burden of breast cancer disease is high with the late stage presentation being a common feature. It has been observed that more than half of the patients present in advanced stages (stage III and stage IV) (Hussain et al., 1996).

One in every nine Pakistani women is likely to suffer from breast cancer which is one of the highest incidence rates in Asia (Sohail et al., 2007). Several histopathological features have prognostic significance in breast cancer like cancer subtypes, tumor grade, lymphovascular invasion, oestrogen and progesterone receptor status, proliferation markers and DNA content, peptide hormones, growth factors and their receptors, oncogenes, and tumour suppressor genes (Alahwal, 2006). Breast cancers are classified in different forms regarding their origin, grading, staging and receptor status. Each of the type influences the prognosis and affects treatment response.

The present study was performed on 134 patients (133 female and 1 male) affected with breast cancer who were registered in CENAR. As the population of Pakistan consist of different ethnic groups. In this study, the most common ethnic group was Pashtoon with a total of 42 female breast cancer patients and common age group was

*[1]Department of Biotechnology and Informatics, BUITEMS, [2]Center for Nuclear Medicine and Radiotherapy (CENAR), Quetta, [3]Center for Advanced Molecular Biology (CAMB), [4]Institute of Biochemistry and Biotechnology (IBBt), UVAS, [5]Mayo hospital, Lahore, Pakistan *For correspondence: hameedbaloch77@yahoo.com*

41-50 years with a total of 50 patients. Invasive ductal carcinoma (IDC) was the most common feature of breast cancer by presenting in 128 patients (95.5%) followed by lobular carcinoma (ILC).

Materials and Methods

This study was conducted in BUITEMS (Balochistan University of Information Technology, Engineering and Management Sciences) Quetta, and CENAR (Center of Excellence for Nuclear medicines and Radiotherapy) Quetta, from August 2010 to February 2012. During this study, the breast cancer cases were investigated at CENAR. These subjects had been referred to CENAR from different hospitals by physicians and surgeons of Quetta after they have been diagnosed positive for breast cancer. Patients who were registered in CENAR with diagnosed breast cancer were interviewed by providing them an already developed questionnaire. Informed consent was taken from the patients who took part in this study. Body Mass Index (BMI) was calculated by measuring height and weight of the patients. Available biopsy reports were obtained from patients files. After getting the data from the patients and their respective files, all the cases were classified into age, gender, ethnic group (Baloch, Pashtoon, Punjabi, Afghani, Hazara) BMI, cancer type, cancer grade, hormonal status, side of the cancer, infertility and marital status. BMI was calculated by using the formula (Weight/Heigt^2). Weight was taken in kg and height was taken into cm.

Results

In this study, 134 patients of breast cancer were investigated, 131 were married and 3 were unmarried and infertility was reported in 11 patients. Pashtoon ethnic group was the most common (Table 1 and Figure 1A). The common age group was 41-50 years (Figure 1B). Invasive ductal carcinoma (IDC) was the most common type of breast cancer in this study with a total of 128 patients (95.5%) followed by invasive lobular carcinoma (ILC) (Figure 1C). There were 3 patients with apocrine carcinoma, 9 with Paget's disease, 5 with metaplastic carcinoma, 1 with Ewing's sarcoma and 7 patients with comedo type necrosis were also reported. A total of 70 patients (52.2%) were affected on left side, 60 patients (44.8%) on right side and 4 patients (2.9%) affected bilaterally (Figure 1D). Breast cancer with grade III was most common (Figure 1E).

The hormonal status of 47 patients was available, the resuklts being shown in Table 1 and Figure 1F. Body mass index (BMI) was calculated by measuring the patient's height and weight., 43 (32.1%) being overweight, 23 (17.2%) obese and 1 (0.75%) severely obese (Figure 1G). Family history of cancer was also obtained from patients and there were 10 patients with family history of different type of cancers and 8 patients have first degree relatives affected from different type of cancers.

Discussion

Present study was undertaken to figure out the pattern of the breast cancer and its various aspects in Balochistan region. There were the similarities as well as differences in the results of the present study in comparison to some already performed studies.

Gender is the highest risk factor of the breast cancer and all the women irrespective of their race, ethnicity, origin and heritage are at risk of developing breast cancer (Siddiqui et al., 2003). The results of present study showed that out of 134 patients only single male breast cancer patient was observed. The common age group was 41-50

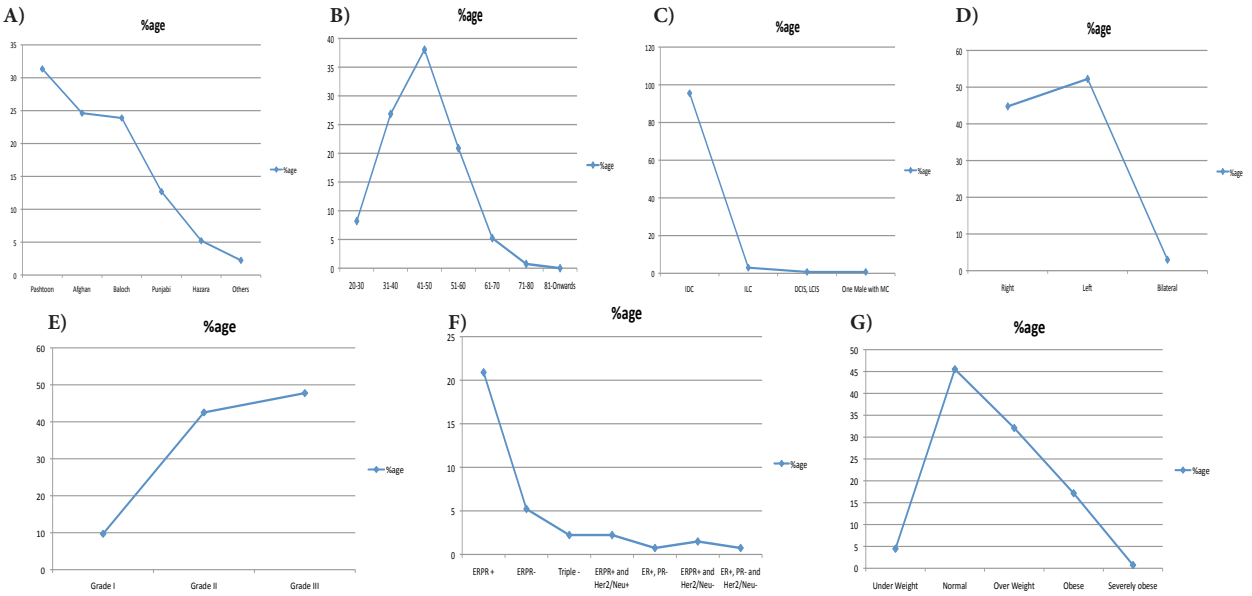

Figure 1. A) Distribution of Breast Cancer Patients by Ethinicity, B) Distribution of Breast Cancer Patients by Age Group, C) Distribution of Breast Cancer Patients by Cancer Type, D) Distribution of Breast Cancer Patients Affected by Side, E) Distribution of Breast Cancer Patients by Cancer Grade, F) Hormonal Status of Different patients (Total No. of patients studied for Hormonal Status were; 47), G) Distribution of Breast Cancer Patients by Body Mass Index (BMI).

Table 1. Characteristics of Breast Cancer Patients from Balochitan

Variables	Cases	Percentage
Ethinicity		
Pashtoon	42	31.30
Afghan	33	24.60
Baloch	32	23.90
Punjabi	17	12.70
Hazara	7	5.20
Others	3	2.23
Age at Diagnosis		
21-30	11	8.20
31-40	36	26.90
41-50	51	38.00
51-60	28	20.90
61-70	7	5.20
71-80	1	0.74
Histological Type		
IDC	128	95.50
ILC	4	2.98
DCIS/LCIS	1	0.74
Other Types		
Apocrine Variant	3	2.23
Paget's Disease	9	6.70
Metaplastic Carcinoma	5	3.70
Comedo Type Necrosis	7	5.20
Patients affected by Side		
Left	70	52.20
Right	60	44.80
Bilateral	4	2.90
Tumor Grade		
Grade I	13	9.70
Grade II	57	42.50
Grade III	64	47.80
Hormonal Status		
ER/PR Positive	28	20.90
ER/PR Negative	7	5.20
Triple Negative	3	2.20
Triple Positive	3	2.20
ER Positive/PR Negative	1	0.74
ER Negative/PR Positive	2	1.50
ER/PR Positive and Her2/Neu Negative	2	1.50
ER Positive, PR and Her2/Neu Negative	1	0.74
Body Mass Index (BMI)		
Under Weight (<18.5)	6	4.80
Normal (18.5-24.9)	61	45.50
Over Weight (25-29.9	43	32.10
Obese (30-39.9)	23	17.20
Severely Obese >40	1	0.75

years with a total of 51 patients followed by age group 31-40 years where a total of 36 patients were observed.

The age group where most of the breast cancer patients observed between 41-50 years was in consistence with the findings of (Naeem et al., 2008). Although (Mamoon et al., 2009) found that the mean age was 48±12 years, findings were also documented by (Siddiqui et al., 2003) that the mean age of diagnosis of breast cancer was 49 years and similarly (Burgri et al., 2007) in their study carried out in Karachi south found that the diagnosed breast cancer cases observed in women were below 50. In another study performed on Pakistani breast cancer cases (Sohail et al., 2007), it was found that the women in Pakistan get the breast cancer disease at younger age as compared to western women with more lesions and more prone to metastatic cancers.(Breast Cancer-UK Incidence Statistics, 2011) shows that the breast cancer risk is strongly related to age, with 81% of cases occurring in women aged 50 years and over, nearly half (48%) of cases of breast cancer are diagnosed in age groups 50-69 and similarly breast cancer in another study found that 62.7 years is the mean age of the subjects enrolled (Adedayo et al., 2009).

Ethnicity or genetic make-up is important risk factors for women to develop breast cancer. There are several different factors that make a person to prone to breast cancer i.e. socioeconomic status, lifestyle, family history, reduced access to health facilities, and lack of awareness (Rowan et al., 2009). In the present study, patients from different ethnic groups were included and Pashtoon was the most common ethnic group with 42 patients followed by 33 patients Afghans and 32 Baloch patients although our data do not represent whole population of Pakistan as the data has been collected only from hospitals which are not representative of whole population. (Burgri et al., 2007) in their study found that a slightly higher risk was observed in migrant ethnicities especially in Muhajirs both Indians and Afghan, where as the risk was low in Pathans (in our study shown as Pashtoon) belonging to North Western Pakistan. In our study the Pashtoon ethnic group belonging to North Western Balochistan is the highest risk group and the second highest risk group are Afghan migrants followed by local Baloch population. In a study carried out by (Ries et al., 2003) showed that the average annual age-adjusted incidence rate of breast cancer from 1996-2000 was 14.8 cases /100,000 among white women, 121.7 among African Americans, 97.2 among Hispanics and 58 in American Indians, which suggests that the higher incidence rates in whites compared with other ethnic groups may be due to several risk factors that differ across the racial and ethnic sub populations (Ries et al., 2003).

Three patients with apocrine carcinoma were identified which is a very rare type of breast cancer originates in the sweat glands of the breast that mostly affects the women in their 60s and 70s, with an average age of 65 (Tanaka et al., 2008; Yerushalmi et al., 2009), while in this study the mean age of patients with apocrine carcinoma was 47 years. There were 9 (6.7%) patients diagnosed with Paget's disease whereas in previous studies it has been reported that paget's breast cancer is 1-4% (Burket et al., 1998; Gunhan-Belgen et al., 2006) and similarly in the study of (Burgri et al., 2007) it only accounts 0.6%. In addition to paget's disease of breast cancer, 5 (3.7%) patients with metaplastic carcinoma were found which is a rare heterogeneous neoplasm. Previous studies showed that reported incidence of the metaplastic carcinoma in breast is 0.2% of all breast cancers (Rauf et al., 2006; Patrikar et al., 2007).

Overweight or obesity also increases the breast cancer risk most likely after menopause (Kushi et al., 2007). In present study, 35 patients were found overweight and 24 patients were obese. Different studies suggest that high body mass index is associated with a two fold increase in the risk of breast cancer in postmenopausal women (Ballard-Barbash et al., 1996; Ramon et al., 1996; Huang et al., 1997; Mc Pherson et al., 2000; Zhu et al., 2005).

Breast cancer is a multifaceted disease with different biological subtypes and diverse natural history, the prognosis and treatment strategies are diverse for different types of breast cancers (Adedayo et al., 2009). Hormonal status is one of the important molecular features of the breast cancer and many types of breast cancer present a distinct hormonal status with different prognostic implications. In the present study, 28 patients were ER/PR positive, 7 ER/PR negative, 3 Triple negative, 3 Triple positive, 1 ER positive and PR negative, 2 ER- and PR positive, 2 ER/PR positive and Her2/Neu negative and 1 ER positive, PR and Her2/Neunegative. While in the study of (Adedayo et al., 2009) 10% cases were with ER/PR and HER2/Neu positive, 69% ER/PR positive and HER2/Neu negative, 7.5% with ER/PR negative and HER2/Neu positive and 13.4% were triple negative. During this study 112 patients (83.5%) with IDC which was the common type followed by ILC (2.29%). Comparing the results with previous studies (Siddiqui et al., 2003; Mamoon et al., 2009) it can be concluded that IDC is the common type.

In summary, we conducted a comprehensive study in Balochistan on 134 patients with breast cancer, where Pushtoon was the most common ethnic group, IDC was common type and most of the patients were with ER/PR positive hormonal status.

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References

Adedayo A, Onitilo MD, Jessica M et al, (2009). Breast cancer subtypes based on ER/PR and Her2 expression: comparison of clinicopathologic features and survival. *Clinical Med & Res*, **7**, 4-13.

Alahwal MS (2006). HER-2 positivity and correlations with other histopathologic features in Breast Cancer patients–hospital based study. *J Pak Med Assoc*, **56**, 65-8.

Ballard-Barbash R, Swanson CA (1996). Body weight: estimation of risk for breast and endometrial cancers. *Am J Clin Nutr*, **63**, 437-41.

Banning, Maggi, Haroon Hafeez, et al (2009). The Impact of culture and sociological and psychological issues on muslim patients with breast cancer in Pakistan. *Cancer Nursing*, **32**, 1-8.

Breast cancer - UK incidence statistics, (2011).

Bhurgri Y, Kayani N, Faridi N, et al (2007). Patho-epidemiology of breast cancer in Karachi '1995-1997. *Asian Pac J Cancer Prev*, **8**, 215-20.

Burke ET, Braeuning MP, McLelland R, Pisano ED, Cooper LL (1998). Paget disease of the breast: a pictorial essay. *Radio Graphics*, **18**, 1459-64.

Faiza Ahmed, Sadia Mahmud, Juanita Hatcher, et al (2006). Breast cancer risk factor knowledge among nurses in teaching hospitals of Karachi, Pakistan: a cross-sectional study. *BMC Nursing*, **5**, 6.

Gunhan-Bilgen I, Oktay A (2006). Paget's disease of the breast: clinical, mamographic,sonographic and pathologic findings in 52 cases. *Eur J Radiol*, **60**, 256-63.

Harold A, Oberman M D (2006). Sarcomas of the breast cancer. *Cancer*, **18**, 1233-43.

Huang Z, Hankinson SE, Colditz GA, et al (1997). Dual effects of weight and weight gainon breast cancer risk. *JAMA*, **278**, 1407-11.

Hussain MM, Ansari AK, (1996). Late presentation of carcinoma breast in Pakistani women. *Pak Armed Forces Med J*, **46**, 11-5.

Kushi LH, Marilyn L, Kwan, et al (2007). Lifestyle factors and survival in women with breast cancer. *J Nutr*, **137**, 236-4.

Ludwig J (2008) Personalized therapy of sarcomas: integration of biomarkers for improved diagnosis, prognosis, and therapy selection. *Curr Oncol Rep*, **10**, 329-37.

Mahmood S, Rana TF, Ahmad M (2006). Common determinants of Ca Breast–a case control study in Lahore. *Ann King Edward Med Coll*, **12**, 227-8.

McPherson K, Steel C M, Dixon J M, (2000). Breast cancer—epidemiology, risk factors and genetics. *BMJ*, **321**, 624-8.

Meijers-Heijboer H, Ouweland A, Klijn J, et al (2002). Low penetrance familial breast cancer susceptibility due to CHK2 1100delC in non-carriers of BRCA1 or BRCA2 mutations. *Nature Genetics*, **31**, 55-9.

Mamoon N, Sharif MA, Mushtaq S, et al, (2009). Breast carcinoma over three decades in northern Pakistan — are we getting anywhere? Armed Forces Institute of Pathology, Rawalpindi, Pakistan; 59 .

Naeem M, Khan N, Aman Z, et al (2008). Breast cancer: experience at lady reading hospital, Peshawar. *J Ayub Med Coll*, **20**, 22-5.

Patrikar A, Maimoon S, Mahore S, Akhtar MA, Wilkinson A (2007) Metaplastic carcinoma of breast (carcinosarcoma variant): a case report. *Indian J Pathol Microbiol*, **50**, 396-8.

Ramon JM, Escriba JM, Casas I, et al (1996). Age at first full term pregnancy, loctation and parity and risk of breast cancer: A case-control study in Spain, *Eur J of Epibemiol*, **12**, 449-53.

Rauf F, Kiyani N, Bhurgni Y (2006). Metaplastic carcinoma of breast, an intriguing rarity. *Asian Pac J Cancer Prev*, **7**, 667-71.

Ries LAG, Eisner MP, Kosary CL (2003). Cancer Statistics Review, 1975-2000. Bethesda, MD: National Cancer Institute.

Siddiqui M S, Kayani N, Gill M S, et al (2003). Breast Diseases: a histopathological analysis of 3279 Cases at a Tertiary Care Center in Pakistan. *J Pak Med Assoc*, **53**, ?-?.

Sohail S, Alam SN (2007) Breast cancer in Pakistan–awareness and early detection. *J Coll Physicians Surg Pak*, **17**, 711-2.

T Rowan T, Chlebowski, Lewis H, et al, (2009). Breast cancer after use of estrogen plus progesterone in postmenopausal women. *N Engl J Med*, **360**, 573-87.

Tanaka K, Imoto S, Wada N, Sakemura N, Hasebe K (2008). Invasive apocrine carcinoma of the breast: clinicopathologic features of 57 patients. *Breast J*, **14**, 164-8.

World Cancer Report". (2008) International Agency for Research on Cancer. http://www.iarc.fr/en/publications/pdfs-online/wcr/2008/wcr_2008.pdf. Retrieved 2011-02-26.

Yerushalmi R, Hayes M.M, Gelmon KA (2009). Breast carcinoma—rare types: review of the literature. *Annals of Oncology*, **20**, 1763-70.

Zhu K, Caulfield J, Hunter S, et al (2005). Body mass index and breast cancer risk in African American women. *Ann Epidemiol*, **15**, 123-8.