



Pattern and Socio-Demographic Determinants of presentation of Breast Cancer

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ABSTRACT

Introduction: Breast cancer is a rapidly growing cancer among women of Pakistan. Due to its bi-modal age distribution and being the most prevalent cancer there is a dire need to identify changes in distribution of epidemiological determinants influencing disease presentation. The aim of the study was to identify patterns and socio-demographic determinants of presentation of breast cancer in female patients attending oncology hospitals of Lahore. **Material & methods:** A cross-sectional study was conducted using a self-structured questionnaire, containing questions about age, marital status, education, employment and socioeconomic class, administered on diagnosed breast cancer patients of two Oncology Hospitals/Centers of Lahore. A total of 370 females diagnosed with breast cancer were conveniently enrolled in this descriptive study. **Results:** Out of a total of 370 patients, 263 patients were ≥ 40 years of age (71.1%), 308 (83.2%) were married, 130 (35.1%) patients did not receive any form of formal education, 319 (86.2%) patients were unemployed and 197 (53.2%) were from the lower socioeconomic group. In addition to this, 181 (48.9%) were diagnosed at stage III of the disease and 73 (19.7%) were diagnosed at Stage IV. Stage of presentation was significantly associated with socio-economic status, employment status and education level, while it was not associated with age and marital status. **Conclusion:** Recognizing the patterns of Breast Cancer in the region is important to identify the risk factors associated with the disease. It is necessary to educate communities regarding early detection and recognizing the symptoms of breast cancer. There is an urgent need to increase the accessibility of screening methods for patients older than 40 years of age.

Key words: Breast cancer, Socioeconomic Class, Screening, Age.

INTRODUCTION

With demographic transition, cancers become one of the leading causes of death among both genders with breast cancer being top on the list among females. Breast cancer results due to malignant transformation of cells of breast tissue. Signs of breast cancer most frequently include breast lump, change in the shape of the breast and fluid discharge. 99% of cases of breast cancer occur in women. Worldwide, breast cancer is the most frequently

diagnosed cancer in women. Nearly 1.7 million new cases were diagnosed in 2012. This accounted for 25% of all new cancer cases in females from which 53% occurred in less developed countries (Account for 82% of the total population of the world). 15.4 % of cancer deaths in more developed countries are attributed to breast cancer, making it second only to lung cancer¹. In less developed countries it is the most frequent cause of death in women constituting 14.3% of the total². In the developing regions of the world, the incidence of breast cancer is on the rise

owing to various factors such as improved screening, rising obesity, sedentary lifestyles and smoking, older age at first birth, shorter duration of breastfeeding and a lot more^{3,4}. Only 5-10% of all breast cancer cases are due to inherited gene defects including BRCA1 and BRCA2⁵. There is no National Cancer Registry in Pakistan and most of the available epidemiological data on cancer is provincial. The Punjab Cancer Registry (PCR) reports that Breast cancer is the most common cancer among women in the province, accounting for 43.9% of all cancers reported in 2014⁶. 36% of cancer related deaths in females in Lahore are attributed to breast cancer⁷. The average age at presentation in Pakistan is 47±12 years⁸. In the US, fewer than 5% cases of breast cancer occur in women younger than 40 years of age⁹. Previous studies in Pakistan have reported a link between lower socioeconomic status and lower education levels with diagnosis of breast cancer at an advanced stage^{10,11}. In the US, 61.4% of cases are diagnosed at localized stage (stage 1) and only 2% cases present with metastatic disease (stage 4)¹². This is in contrast to many studies done in Pakistan in which metastatic disease can account for up to 36% of breast cancer cases at presentation^{8,13,14}. Pakistan is one of the high burden countries for breast cancer and showed a changing epidemiology over the last decades. The objective of this study is to describe the pattern and socio-demographic determinants of breast cancer presentation in the female patients from INMOL Cancer Hospital and Sir Ganga Ram Cancer Hospital, Lahore, Pakistan.

MATERIALS AND METHODS

This is a cross-sectional epidemiological study conducted at the outpatient departments and oncology ward of INMOL Cancer Hospital and Sir Ganga Ram Hospital, Lahore over a period of 6 months between February to July 2016. All histologically diagnosed breast cancer female patients attending OPDs or indoors of the oncology centers were our study population. Out of these females, we enrolled 370 through simple random sampling (draw method) after making a sampling frame from each day's OPD registers and indoor admission registers. Eligible females were enrolled after taking written informed consent. Sample size was calculated using sample size calculators for single proportion. Pregnant patients and those patients whose diagnoses were concealed from them

by their family were excluded from the study. A self-constructed, structured questionnaire containing questions about Age, Marital Status, Education, Employment and Socioeconomic class was first translated into Urdu and then back to English to ensure coherency, understanding and validity. The final Urdu version was used in the interview process. As reported in Government of Pakistan Economic Survey of Pakistan-2001-2, Islamabad, Ministry of Finance, June (2002): Socioeconomic status is a function of annual household income, with US\$<500 = Low, US\$500-1000 = Middle, US\$>1000=High¹¹. The TNM stage at which cancer was diagnosed was recorded from the patient's file. Staging of breast cancer was based on AJCC TNM system of classification. Advanced stage breast cancer was defined as cancer of stages 2b, 2c, 2d, 3 and 4¹⁵. All other stages were taken as early stage breast cancer. Ethical issues were considered and addressed. Written informed consent obtained along with permission from INMOL and Sir Ganga Ram Hospital to conduct the study, maintaining confidentiality of data and patient information. Forms were kept anonymous. Formal ethical clearance was taken from IRB of Shaikh Zayed Medical Complex.

Statistical analysis

Statistical Package of Social Sciences Version 23 was used for data analysis and compilation.. All data input was carried out by the authors themselves and the data was double checked for consistency

Category	Groups	N	%
Age	<40	107	28.9
	≥40	263	71.1
Marital Status	Married	318	85.9
	Unmarried	16	4.3
	Divorced	4	1.1
	Widowed	32	8.6
Level of Education	Uneducated	130	35.1
	Primary Level (Less than 5 years)	36	9.7
	Middle (Less than 9 years)	37	10
	Matric/O levels/	64	17.3
	F.A.F.S.c/	32	8.6
	University	71	19.2
Employment Status	Employed	45	12.2
	Unemployed	319	86.2
	Retired	6	1.6
Socio-economic Status	Upper Class	20	5.4
	Middle Class	153	41.4
	Lower Class	197	53.2

Table 1: Distribution of socio-demographic factors among breast cancer females

RESULTS

Out of the total of 370 patients, 107 were <40 years (28.9%) and the remaining 263 patients were diagnosed at ≥40 years of age (71.1%). 308 (83.2%) were married, 16 (4.3%) were unmarried, 32 (8.6%) were widowed and only 4 (1.1%) were divorced. Education level of patients showed an interesting trend with 130 (35.1%) patients being uneducated, 36 (9.7%) women had an education till the primary level, 37 (10.0%) studied till less than 9 years, 64 (17.3%) of them till Matric/O levels, 32 (8.6%) patients till F.A/FSc and 71 were graduates from a university (19.2%). 319 (86.2%) patients were unemployed, only 45 (12.2%) of them were employed and 6 (1.6%) patients had retired from their jobs. 197 (53.2%), a considerable majority of patients were from the lower SEC, 153 (41.4%) patients were from the middle class while only 20 (5.4%) of them were from the upper class. Socio-demographics of breast cancer are also given in Table 1.

Only 9 (2.4%) patients interviewed were diagnosed at stage 1 of the disease with the largest number of people being diagnosed at stage 3 (181/370 - 48.9%) of the disease. A detailed description of the stage at diagnosis is given in Table 2. In summary, 280 patients (75.7%) were diagnosed at an advanced stage (2b, 2c, 2d, 3 and 4) while the remaining, only 90 patients, (24.3%) were diagnosed at an early stage

of the disease. Refer to Diagram 1 for a breakdown of stage-wise presentation.

Staging	N	%age
1A	5	1.4
1B	4	1.1
IIA	81	21.9
IIB	26	7
IIIA	64	17.3
IIIB	82	22.2
IIIC	35	9.5
IV	73	19.7
Total	370	100

Table 2: Stage-wise presentation of breast cancer at the time of diagnosis

Distribution of different socio-demographic factors with TNM staging at the time of diagnosis in breast cancer females is given in Table 3. Association of socio-demographic factors with early and advanced stage of presentation at the time of diagnosis in breast cancer females is given in Table 4. Stage of presentation was significantly associated with socio-economic status, employment status and education level, while it was not associated with age and marital status. It was found that low socioeconomic group, unemployed and illiterate females presented with advanced stage significantly more than others.

Category	Groups	1A	1B	IIA	IIB	IIIA	IIIB	IIIC	IV	Total
Age	<40	0	0	25	5	23	19	7	28	107
	≥40	5	4	56	21	41	63	28	45	263
	Total	5	4	81	26	64	82	35	73	370
Marital Status	Married	5	0	76	22	57	66	32	60	318
	Unmarried	0	0	4	1	3	8	0	0	16
	Divorced	0	0	0	1	2	0	1	0	4
	Widowed	0	4	1	2	2	8	2	13	32
	Total	5	4	81	26	64	82	35	73	370
Level of Education	Uneducated	0	0	20	2	24	32	13	39	130
	Primary Level (Less than 5 years)	0	0	3	5	9	9	5	5	36
	Middle (Less than 9 years)	0	0	6	5	9	6	4	7	37
	Matric O/ levels	5	4	9	3	9	8	5	21	64
	F.A.F.S.c/	0	0	6	2	3	13	8	0	32
	University	0	0	37	9	10	12	2	1	71
	Total	5	4	81	26	64	80	37	73	370
Employment Status	Employed	0	0	19	5	8	8	2	3	45
	Unemployed	5	4	60	21	56	70	33	70	319
	Retired	0	0	2	0	0	4	0	0	6
	Total	5	4	81	26	64	82	35	73	370
Socio-economic Status	Upper Class	0	0	9	3	3	1	1	3	20
	Middle Class	5	0	49	12	24	34	15	14	153
	Lower Class	0	4	23	11	37	47	19	56	197
	Total	5	4	81	26	64	82	35	73	370

Table 3: Socio-demographic factors with TNM staging at the time of diagnosis in breast cancer females

Category	Groups	Early stage presentation	Advanced stage presentation	P-value
Age	<40	25(23.4%)	82(76.6%)	0.387
	≥40	65(24.7%)	198(75.3%)	
	Total	90(24.3%)	280(75.7%)	
Marital Status	Married	81(25.5%)	237(74.5%)	0.831
	Unmarried	4(25%)	12(75%)	
	Divorced	0(0.0%)	4(100%)	
	Widowed	5(15.6%)	27(84.4%)	
	Total	90(24.3%)	280(75.7%)	
Level of Education	Uneducated	20(15.4%)	110(84.6%)	0.000
	Primary Level (Less than 5 years)	3(8.3%)	33(91.6%)	
	Middle (Less than 9 years)	6(16.2%)	31(83.8%)	
	MatricO levels/	18(28.1%)	46(71.9%)	
	F.A/F.Sc/	6(18.8%)	26(81.3%)	
	University	37(52.1%)	34(47.9%)	
Employment Status	Total	90(24.3%)	280(75.7%)	361
	Employed	19(42.2%)	26(57.8%)	
	Unemployed	69(21.6%)	250(78.4%)	
	Retired	2(33.3%)	4(66.7%)	
	Total	90(24.3%)	280(75.7%)	
Socio-economic Status	Upper Class	9(45.0%)	11(55.0%)	0.000
	Middle Class	54(35.3%)	99(64.7%)	
	Lower Class	27(13.7%)	170(86.3%)	
	Total	90(24.3%)	280(75.7%)	

Table 4: Association of socio-demographic factors with early and advanced stage of presentation at the time of diagnosis in breast cancer females

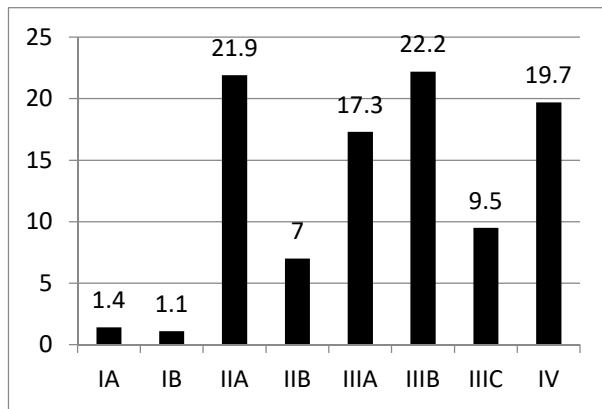


Figure 1: Stage-wise presentation of breast cancer at the time of diagnosis

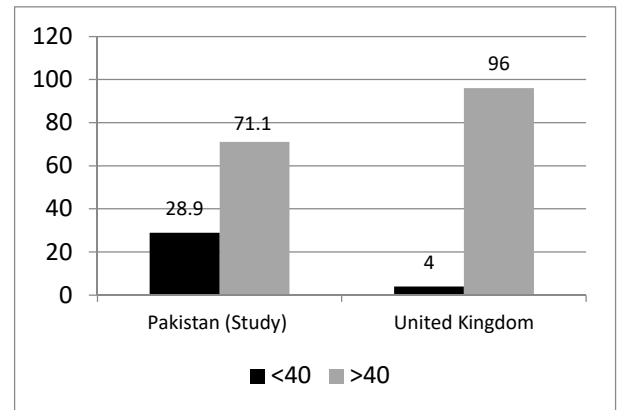


Figure 2: Age comparison of breast cancer patients in Pakistan and the UK

Source: Breast cancer statistics [Internet]. Cancer Research UK. 2015 [cited 14 August 2016].

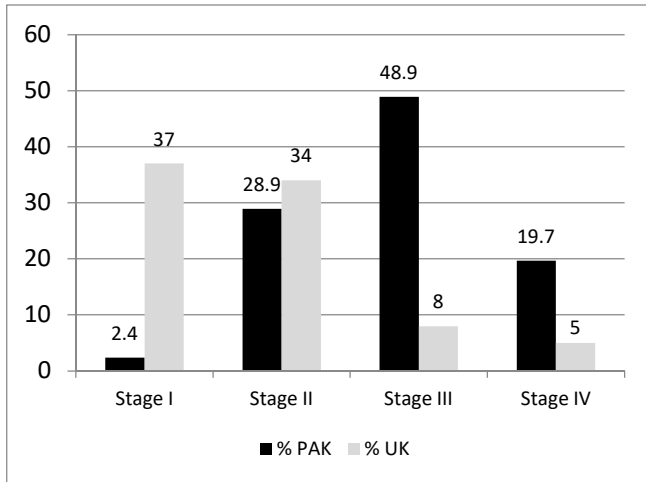


Figure 3: Comparison of stages at presentation in Pakistan and the UK

Source: Breast cancer statistics [Internet]. Cancer Research UK. 2015 [cited 14 August 2016].

DISCUSSION

In their cross-sectional study of cancer epidemiology in Lahore, Badar F, Mahmood S, Yusuf MA, et al reported that breast cancer has the highest Age-Standardized Incidence Rates (ASIRs) among women at 47.6%, followed by cancer of the ovary at 4.9%⁷.

In women belonging to the Lahore district, the ASIR of breast cancer ranked the highest of all the cancers at 47.6%, and was higher than that for Delhi (31.6%), but relatively low compared to that reported for the Israeli Jews (89.4%)⁶.

The average age at presentation in Pakistan is 47 ± 12 years⁸. In this study, 71.1% of participants were ≥ 40 while in the UK 96% of female patients of Breast Cancer were ≥ 40 at presentation (See Diagram 2). In the US, fewer than 5% cases of breast cancer occur in women younger than 40 years of age⁹. In more developed countries, 58% of newly diagnosed cancer cases occur at ≥ 65 years of age, while this age group comprises only 40% of new cases in developing countries. This is due in part to the fact that developing countries have a greater proportion of younger individuals in their population¹. 76.6% of women who were <40 presented with advanced stage disease (Refer to Table 4). This may be due to social stigmas associated with breast cancer, and fear of neglecting family responsibilities due to treatment that many women harbor.

It is important to note that most of the cases of breast cancer in Pakistani females present with advanced stage disease. 19.7% percent of the cases in our study presented with metastatic cancer, at Stage 4. This is in wide contrast to the trend in the US, where metastatic disease accounts for only 2% of cases at presentation, and the UK where it accounts for 5% of cases at presentation¹⁶ (Refer to Diagram 3). This is largely because of the emphasis on early screening in western healthcare systems, given that it is a part of routine medical check-ups for women above 40 years of age to have an annual mammography done to detect cancer in its early stages along with breast clinical and self-examination.

As a result, most women are diagnosed incidentally or because they immediately go to the doctor upon detection of a lump. Here in Pakistan, there is hesitancy among women to discuss breast-related symptoms, and many women harbor breast lumps in silence and are only inclined to visit the doctor if and when a close relative or friend supports them. 53.2% of patients who presented belonged to the lower SEC, out of these 170 (60.7%) presented with advanced disease, suggesting a positive association between lower SEC and advanced disease (Refer to Table 4). This is not surprising as nearly one-third of the population in Pakistan is below the poverty line¹⁷. Many Pakistanis cannot afford the basic necessities of food, housing and clothes and the quality of healthcare available to most is subpar. According to UNESCO, Pakistan has one of the lowest literacy rates in the world at 55%, while only 26% of girls and 12% of women are literate¹⁸. 34.9% of the participants of the study were thus uneducated and 10.3 % had received education till the primary level while 19.2% had university level education. 84.6% of the uneducated patients who presented had advanced disease in contrast to only 47.9% people who had received university level education presenting late.

CONCLUSION

The incidence of breast cancer in Pakistan has seen an alarming rising trend over the years. Though this could simply be attributed to more hospitals and a slowly but surely improving healthcare system, it is important to recognize the risk factors associated with Breast Cancer in our region and educate communities regarding early detection and recognizing the symptoms. There is a need to increase awareness of basic cancer screening and

make mammography available and affordable to women from all strata of society for earlier detection of cases. There is a need to establish a National Cancer Registry to follow the epidemiological trends of breast cancer and assess the disease burden in our region and compare it with other regions of the world. It is only after an accurate estimate of this data is reached that the Public Health Sector can move towards catering to the needs of breast cancer patients in an effective and efficient manner

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