Basic Findings of Incidence of Breast Cancer in Allied Hospital Faisalabad, Pakistan: A Retrospective Study

Aasma Munawwar [1], *Amna Sajjad [1], *Shahla Faisal [2], Azhar Rasul [1], Aneeqa Zarbab [1], Afshan Bibi [1], Adnan Ahmad [1], Salma Siddique [3]

1. Department of Zoology, Government College, University Faisalabad, Faisalabad, Pakistan
2. Department of Statistics, Government College University, Faisalabad, Pakistan
3. Institute of Industrial Biotechnology, GCU Lahore, Lahore, Pakistan

*Corresponding Authors: Email: amnasajjad7@yahoo.com; drshahlafaisal@gcuf.edu.pk

Abstract

Background: Breast cancer is the most common malignancy among women worldwide. We aimed to know the past trends of age-specific breast cancer incidence rates in Faisalabad city.

Methods: A retrospective study was designed at Allied Hospital Faisalabad (AHF), Pakistan from 2014-2018. Overall, 12742 cancer patients presented throughout these years, out of which 3390 were breast cancer cases. Descriptive statistics were computed and the results were presented as counts and percentage for categorical variables. Means and standard errors were computed for the continuous variables. For testing the association among categorical variables, a chi-square test of independence was used and the p-values less than 0.05 are reported as significant.

Results: 84.70% patients were diagnosed with invasive breast carcinoma and 15.30% were all other types reported in the Allied Hospital Faisalabad. The incidence of breast cancer was outrageous in the 40-49 year-old age group (1021 patients, 30.12%) and the mean age is 45 in all years. An increase of 34.86% was observed from 2014 to 2018. The comprehensive four-year data (2015 to 2018) were further analyzed for histology, surgery, staging and grading pattern as 2014 files data was insufficient to discuss. The stage III and grade III were most common throughout the years from 2015 to 2018 with 33.9% and 55.71% respectively.

Conclusion: Breast cancer is diagnosed more commonly in women than in any other type of cancers in Faisalabad city. There is a need to upgrade the existing hospital facilities to make the women diagnose the cancer at an earlier stage.

Keywords: Retrospective; Breast cancer; Incidence; Faisalabad; Surgical methods

Introduction

Breast cancer is the most common malignancy among women worldwide (1, 2) In Pakistan breast cancer ranks 2nd in incidence and 1st in death (3). According to the WHO statistics, the new cases of breast cancer reported in 2020 worldwide were 2.26 million with an estimated 6.9% deaths. Breast cancer ranks as the fifth leading cause of death among other cancers just be-

cause of better prognosis in developed countries (3). Globally yearly-life-loss of the breast was 23.9% (17.3-28.7) among other cancers from 2007 to 2017 (4). Pakistan has the highest incidence of breast cancer in Asia. At some stage of life, 1 in 9 women has become the victim of breast cancer in Pakistan (5, 6). Incidence of breast cancer will be increased approximately 23.1% in 2020 to 60.7% in 2025 (7). The breast cancer cases in women are rising day by day with a frequency of 1.38 million new cases every year, out of which 0.46 million women die in comparison with 9.6 million deaths due to breast cancer annually. If breast cancer diagnosed at an early stage, almost 99 percent breast cancer cases are treatable (8).

Aging and sedentary lifestyles have led to higher incidence of cancer and a steady rise in the rate of breast cancer as well. As a result, individual and socioeconomic expenditures linked with cancer treatment have been increasing with the passage of time (9, 10). In Pakistan, with prevailing breast cancer awareness approaches are not enough for early diagnosis (11). There is a dearth of literature investigating the socio-cultural factors that impede women from breast cancer screening, diagnosis and treatment (12). The reasons behind the late presentation of the disease were wrong beliefs, lack of awareness about the disease, whereas, illiteracy and poor social status are important contributing factors for late diagnosis which lowers the survival rate of the patients (13).

The risk factors associated with breast cancer are obesity, high intake of dairy products, poor nutrition as well as vitamin D deficiency (14-16). Mutation in the expression of miRNA gene is linked with different diseases as well as in breast cancer. A cohort study was conducted in Karachi, Pakistan in which it is stated that the patient with heterogenetic genotype CT has greater risk of breast cancer as compared to homozygous CC genotype (17).

A study in north Pakistan, 39.01% of breast cancer patients presented late, 40.7% wasted time with different medicines, 25.2% had a painless lump, 10.6% felt coyness and 6.5% came late due to other reasons. So, here is a need to do synchronized efforts with the public health department to educate the patients and effective measures should be taken at a local and national level to bring the desired change (11, 18). From the last two decades, studies associated with breast cancer have shown the surprising advancement (19) and have clearly turned into better patient attention as proved by early diagnosis and hits in therapies (20).

The most aggressive feature of breast carcinoma is the metastasis. The different subtypes of breast cancer have distinctive forms of metastasis, receptor status and the sites and the number of metastasis is important for prognosis (21). Accurate disease staging is the only way to modify the treatment method, but still, the lymph node reactivity and tumor size are the basis of breast cancer staging (22). Patients with breast cancer, particularly having comorbidities with chemotherapeutic treatment, facing economic issues, less social support, have a lower health-related quality of life (23).

We aimed to know the pattern of disease in Faisalabad City from 2014 to 2018. Goals of this study were to calculate the incidence rate, types of breast cancer and stage of diagnosis with yearly increase data. In the Faisalabad city, epidemiological study at this level has never been done before, because all cancer information is recorded only in files not in the computer data base. So, we revealed the actual incidence of breast cancer in the local public sector hospital, Allied Hospital Faisalabad (AHF).

Methods

Data Source and Collection
Current retrospective hospital-based study was conducted in Allied Hospital Faisalabad (AHF) and approved ethically (Ref. No.: ZOL/9068/18), by Govt. College University Faisalabad and permission granted by hospital authority, from January 2014 to December 2018. All patients, belonging to any age group and marital status, diagnosed with cancer and admitted to

AHF during the study period were included in the study. Data were in the form of files of patients, containing patient's reports. All data entered manually in the word excel sheets and insufficient information 'emitted. Data pertaining to different variables such as age, sex, surgical methods, grades, histological type, stage of breast cancer patients were noted, stages and grades were categorized according to international standards. For the year 2014, the data was available only for the number of cases and their age. Due to missing entries for the remaining variables as per the record of the files of the patients, further analysis was performed for the years 2015 to 2018.

Graph Pad Prism version 8.0.2 was used to analyze data statistically. Descriptive statistics were computed with respect to age and gender. Mean and standard errors (SE) for continuous variables such as age and counts (n) and percentages (%) were calculated for other categorical variables such as histological type, Treatment methods, Staging and Grading pattern. Chi-square test of independence was used to test any association between the categorical variables like surgical methods and time. The level of significance was taken as 5% and a P-value less than 0.05 was declared as statistically significant.

Results

Total number of breast cancer patients

Total 12742 cases of different cancers were registered out of which 3390 (26.60%) patients were diagnosed with breast cancer with an increasing trend in AHF from 2014 to 2018 with an increasing trend. There were 19 males and 3371 female patients were reported with breast cancer during this period of study.

Marital Status and age distribution pattern

Data set regarding the age and marital status of breast cancer patients were analyzed and maximum breast cancer cases were observed in age group 40-49 (n=1021, 30.83%) for five years (2014-2018). The data for the year 2014 was noted only as number of cases and age due to missing entries for remaining variables as per record of the files of the patients.

A few cases 76 (2.30%) were not included in the age groups as data regarding their age were missing according to their files. The mean age of diagnosis of patients was 47.21±0.21. Majority of cases included in the study were married (Table 1).

Table 1: Age Distribution in Breast Cancer Patients in AHF from 2014-2018

Variable	2014		2015		2016		2017		2018		Total
Age (yr)	n	Mean ± SE	n	Mean ± SE	n	Mean ± SE	n	Mean ± SE	n	Mean ± SE	Count (%)
Upto 30	51	27.90±0.39	71	27±0.38	54	27.85±0.4	59	28.08±0.35	76	27.55±0.31	311 (9.39)
Upto 40	133	37.23±0.25	133	36.71±0.24	175	36.82±0.21	205	37.34±0.2	194	36.7±0.21	840 (25.36)
Upto 50	200	46.84±0.20	173	46.64±0.2	217	46.82±0.2	230	46.85±0.19	267	46.58±0.17	1087 (32.82)
Upto 60	94	56.86±0.30	104	56.33±0.28	146	56.36±0.24	160	56.88±0.24	162	56.21±0.24	666 (20.12)
Upto 70	49	66.35±0.41	43	65.63±0.43	61	66.31±0.36	64	66.31±0.38	88	65.67±0.33	305 (9.21)
Above 70	12	77.75±1.8	15	77.93±1.19	20	79.75±1.6	25	79.64±1.2	31	78.34±8.83	103 (3.11)
Overall	539	46.89±0.51	539	45.86±0.54	673	47.51±0.47	743	47.67±0.45	818	47.67±0.44	3312

AHF= Allied Hospital Faisalabad, n=number of patients, SE= Standard error of Mean

Histological Distribution Pattern from 2015-2018

A total of 2850 cases were included during the years 2015 to 2019 were further analyzed for different epidemiological characteristics such as histology, grading, staging and treatment methods.

Histologically, it was found that 2414 (84.70%) cases were diagnosed with invasive carcinoma of the breast; other types were less common as compared to invasive ductal carcinoma (Table 2). The difference between histological types was significant statistically (*P*-value < 0.01).

Table 2: Histological types of breast cancer patients in AHF from 2015-2018

Histological type	2015	2016	2017	2018	Cases (n)	Percentage (%)
Adenocarcinoma	4	30	4	21	59	2.07
IDC	516	629	639	630	2414	84.71
ILC	4	2	24	19	49	1.71
IMC	8	0	22	6	36	1.26
Medullary carcinoma	3	0	2	11	16	0.56
DCIS	0	0	0	22	22	0.77
Phyllodes tumor	7	11	12	17	47	1.65
Paget's disease	7	0	3	2	12	0.42
Papillary	2	1	1	1	5	0.18
Others	4	0	6	2	12	0.42
Missing data	11	0	69	98	178	6.25
Total	566	673	782	829	2850	100.00

AHF= Allied Hospital Faisalabad, IDC= Invasive ductal carcinoma, ILC= Invasive lobular carcinoma, IMC= Invasive mucinous carcinoma, DCIS= Ductal carcinoma in situ.

Histologically the maximum reported cases were of Invasive ductal carcinoma (IDC) throughout the time 2015-2018. While, the few cases of other related types included, Invasive ductal carcinoma (IDC), Invasive lobular carcinoma (ILC), Invasive mucinous carcinoma (IMC), Ductal carcinoma in situ (DCIS).

Surgical Methods

Different surgical methods were used to treat breast cancer i.e., mastectomy, lumpectomy and biopsies. The category biopsy includes all the patients receiving any kind of biopsy like a wedge, incisional etc. In the case of the surgical methods, 2015-2018 data showed that mastectomy was applied to 1536 (53.89%) patients and breast-conserving surgery (lumpectomy) was performed for 414 (14.52%) patients. The chi-square test showed that the surgical methods are significantly associated with the years (*P*-value<0.001). In 2017-18, surgeries were 582 (49.5%) and on the left side were 530 (45.1%) excluding missing data (Table 3).

Table 3: Types of Surgical Methods of Breast Cancer Patients in AHF from 2015-2018

Surgical method	2015	2016	2017	2018	Cases (n)	Percentage (%)
Mastectomy	369	322	383	462	1536	53.89
Biopsy	61	145	201	121	528	18.53
Lumpectomy	94	99	117	104	414	14.52
Unknown	42	107	81	142	372	13.05
Total	566	673	782	829	2850	

Grading and Staging

Out of the total five years' data (3312), the data for years of data (2850) were analyzed to compare, regarding stage of disease as 2014 data was deficient. Among the breast cancer patients registered in 2015-2018, the most common stage was stage III with patients 966((33.89%) followed by stage IV 620(21.75%). The patients presented with stage I & II were 34(1.19%), 336(11.79%) respectively and there was no patient with zero stage (Table 4). Grade III and Grade II were 55.72% and 28.84% respectively. The Grade I and Grade IV were 1.12%, 0.31% respectively in our findings, excluding missing data.

Table 4: Stage Distribution in Breast Cancer Patients in AHF from 2015-2018

Variable	Stages	2015	2016	2017	2018	Cases (n)	Percentage (%)
Stages	I	2	9	5	18	34	1.19
	II	41	52	72	171	336	11.79
	III	273	226	167	300	966	33.89
	IV	138	144	203	135	620	21.75
	Unknown	112	242	335	205	894	31.37
	Total	566	673	782	829	2850	100.00
Grades	I	7	7	13	5	32	1.12
	II	172	197	219	234	822	28.84
	III	307	459	429	393	1588	55.72
	IV	7	0	0	2	9	0.31
	Unknown	73	10	121	195	399	14.00
	Total	566	673	782	829	2850	100.00

The reasons behind the advanced stage diagnosis include poor knowledge about breast cancer, indulging in superstitions, spiritual statements about the disease and poverty, because cancer treatment is very expensive and unbearable for most of the patients (24).

Discussion

The study was conducted in Allied Hospital Faisalabad (AHF) to study epidemiology of Breast cancer during a five-year period (2014-2018). Collection of data was made retrospectively from the record room of oncology department of AHF. Cases included in the study were confirmed cases of breast cancer as evaluated and registered by medical experts according to the files of the patients. Data were collected for a five-year period ranging from January 2014 to December 2018. A total of 3390 breast cancer cases were included in the study, which were diagnosed and registered as breast cancer patients during this period. Collected data included the information regarding age, sex, surgical methods, grades, histologic type, and stage of the patient.

Generally, there was an increase in the incidence pattern of breast cancer (34.86%) than other types of cancers in AHF during five years from 2014 to 2018. The annual rise was 3.9% in 2014 to 2015, in 2016, it was 15.9%, and in 2017, it was 13.94% and was 5.67% in 2018. In Pakistan, like other developing countries, there is a lack of information about the patients (25). The mortality and survival rates were not studied, as there was no information regarding survival of patients (26).

The incidence of breast cancer was most common in age group 40-49 (n=1021, 30.12%). and there was an increase observed in young age group 30-39 (663, 19.56%) as compared to South Koreans breast cancer analysis in 2015 (n=798 ,9.0%) (9), and in the republic of china, the

common age group was 50-59 years old group (27). A cross-sectional study was done to estimate population-level cancer in Lahore district, Pakistan, which is a part of the Punjab Cancer registry and has 19 collaborating centers in Lahore. The age Standardized Incidence Rate was estimated by site and gender, which was higher in females (101.1) than in men (66.7) (28).

The most common histological type of breast cancer was invasive ductal carcinoma (IDC) during this study (2414, 84.16%) than other types of breast cancer such as invasive lobular carcinoma, mucinous carcinoma, micro papillary carcinoma Paget's disease of the nipple and others special types (n=798,15.84%). Invasive lobular carcinoma contributes majorly to this proportion (29, 30). In our study, IDC was 88% in 2015, 93% in 2016, 86% in 2017 and 85% in 2018.

Different surgical procedures were also observed, out of which mastectomy (53.9%) was mostly performed procedure with better overall survival. In the case of large breast carcinoma, neoadjuvant therapy was performed to reduce the cancer size before any surgery. Breast-conserving surgery and breast reconstruction are increasing in Brazil and mastectomy is decreasing with axillary resection (31). In Asian women with breast cancer, mastectomy is high in young age group, but in case of our study, breast-conserving surgical practices are increasing as compared to mastectomy in young age groups with breast carcinoma (32). It was appeared that mastectomy provides better overall survival than breast-conserving surgery among breast cancer patients 40 years old patients or younger (33).

There was an increase in the ratio of early diagnosis, with stage 0, I, and II accounting for 14.8%, 43.3%, 29.3% of the cases reported in 2015. In developing countries due to better facilities of health, the rates of 0 and I stage is increasing day by day. Therefore, the betterment in the diagnostic procedures, the proportion of early breast cancer was increased (34). In our study, the most common stage was III in our four years of data 966(33.9%) excluding missing data. The stage II and stage I incidence was 11.8% and 1.2% respectively. Unlike the above study, there were no patients of zero stage; only 71 patients were presented with the first stage in our study.

All invasive types of breast cancer were histologically graded (35, 36). The histological grading system is an essential consideration for the evaluation of the breast cancer (37). In our study, most of the patients were recorded with high grades. Health care costs linked to breast cancer are ample, which is almost unbearable for the patients as well as their families. These massive expenditures have a great burden on the patients as well their families. Because most of the patients belong to low-income families, so Government of Pakistan should take strong action to relieve the patients in this morbidity (38).

This study will provide insight into the situation of breast cancer among women in a populated industrial city of Pakistan. Our results mostly resemble with the internationals statistics and urge the government to establish a national cancer registry and took important measures to control the disease. Our study lacks survival and death rate data as we already described that there is no online data base registry of this hospital. The high incidence rate might be due to high pollution index in the area, poverty, lack of awareness and socio-and ethical issues related with the disease.

Conclusion

Breast carcinoma is increasing at a massive rate in Pakistan. Yearly enhancement had been observed of breast cancer patients during the last five years in Allied Hospital Faisalabad. The purpose of this study was to depict the occurrence of disease in our locality. Invasive ductal carcinoma was found as the most common type of breast cancer. A great number of patients were presented with III and IV stage and with poor grades. As it was laborious task to collect data from patients file therefore, there is a dire need for a national cancer registry like other developed countries in order to study the epidemics of the disease in Pakistan. Government should take strict actions to create awareness at social level. Clinics with

screening facilities should be established at city level so that the women approach them easily. There is also a need to upgrade the existing hospital facilities, so that the diagnosis of the cancer can be done at an earlier stage. This study would predict the frequency of breast cancer and help government to take measures to control it.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of Interest

The authors declare no conflict of interest.

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