Epidemiology of Breast Cancer in Urban area of Central India: A cross-sectional study

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Abstract

Introduction: The incidence of breast cancer is rising in India and is now the second most diagnosed cancer in women after cervical cancer. But is the leading cause of death among cancers in women in India.

Objective: To assess the clinic-epidemiological profile, histo-pathological profile and treatment outcomes of breast cancer patients.

Materials and Methods: This hospital based cross-sectional study was carried out in 205 diagnosed patients of breast malignancy at surgery OPD and IPD departments of a Tertiary Government Medical College and Hospital. These patients were investigated, managed and their results are studied**.** Cases of breast cancer are studied in term of clinical presentation, operative finding and post-operative course.

Results: Mean age of patients was 46.53 ± 8.73 years. The disease was more prevalent in post-menopausal and multiparous women and family history was positive in only seven patients. Lump in the breast was the commonest presenting complaint. Around 61% patients had lump size of 2-5 cm. About half (47.5%) of the patients reported between 4-6 months of onset of symptoms and around 62% were in stage III and IV. In 56% of cases, the lymph nodes were

positive. Cuticular necrosis (49.2 %) and Seroma formation (39.8 %) were the most common post-operative complication. On histopathology, the most common type of malignancy was Infiltrating Ductal Carcinoma (74%). On Immunohistochemistry of 95 patients, 49.4% were positive for ER and 47.3% were positive for PR. Her2neu was positive in 13.6% cases.

Conclusion: The known facts for increased occurrence of BC like advanced age, nulliparity, post-menopausal period, family history and delayed first pregnancy are also found in the study but their preponderance is not high. This suggest that every women irrespective of above factors should be more vigilant towards breast cancer screening and prevention.

Keywords-Breast Cancer, lump, multiparous, Infiltrating Ductal Carcinoma, Histopathological Examination (HPE)

Introduction

Breast Cancer (BC) is one of the oldest malignancies known to man with its mention in the Edwin Smith surgical Papyrus as early as 2500 B.C. in Egypt. It is the most common malignant disease among women worldwide, accounting for 24% of new cancer cases and 15% of cancer deaths in 2018. Around 6,26,000 women died of BC in 2008 (representing14% of all cancer deaths among women). It is expected that by 2030 the global burden of BC will increase to over 2 million new cases per year. Furthermore, it is estimated that this increase in cases will be largely due to increasing incidence in developing regions of the world. [1-4]

The incidence of BC is also rising in India and is now the most common cancer among females. The estimated number of cases in India during 2012 was 145,000 with age standardized incidence rate of 25.8 per 100,000 women. The estimated number of deaths in India in the year 2012 was 70,000. As per the Globocan data 2020, in India, BC accounted for 13.5% (178361) of all cancer cases and 10.6% (90408) of all deaths. [5, 6]

Apart from increase in the number of cases over the years, a more grievous situation is that the mortality and morbidity due to breast cancer in India is amongst the highest in the world. This is due to detection of the tumor at advanced stage, mainly due to the lack of awareness and lack of infrastructure to diagnose this disease earlier. In India, over 50% breast cancer patients present late in stages 3 or 4, which has a definite impact on the survival. Also, the disease not only create physical burden but also emotional and economic burden on individual as well as family. [7]

The disease in urban areas of India is three times higher than in rural parts of the country. Trends recorded in urban cancer registries shows increase in the incidence of breast cancer of about 0.5% per year. This increasing incidence in urban area is attributed not only to altered

reproductive period, lifestyle changes and dietary pattern but also to availability of advanced diagnostic tools. [7, 8]

Developments of advanced diagnostic tools like Immunohistochemistry markers: ER PR and Her 2neu & improved therapeutic tools like Radiotherapy and endocrine therapy have helped to guide the treatment; anticipate the outcome and monitor its progress. A study of all these factors is relevant in today's scenario where breast cancer has reached epidemic proportions; as it will help to improve the treatment planning, predict the prognosis and to develop the future control strategies.

Material and Methods

Study setting, study design, study participants, study period and statistical analysis

This hospital-based cross-sectional study was conducted among diagnosed breast cancer patients at surgery department of a tertiary care hospital from June 2017 to December 2019. A total of 205 breast cancer were included in study. All the breast cancer patients attending the surgery outpatient department who have proven evidence of breast malignancy and willing for Modified Radical Mastectomy (MRM) procedure were included and patient with recurrent breast cancer were excluded from this study.

Cases of Breast cancer were studied in term of socio-demographic characteristics, clinical presentation, histopathology, operative finding and post-operative course. A detailed clinical history was taken from the patients at the time of admission. Once the patients had diagnosed of malignancy proven by FNAC, they were admitted to the ward. The patients were examined and thoroughly investigated.

Depending upon the stage of the malignancy and general condition of the patient the management was planned and executed. All the patients who were willing for mastectomy were explained about the surgery. MRM was performed, followed by post-operative care in the wards. Patients were discharged after a healthy recovery and followed for a period of 6 months. During this period they were referred for adjuvant chemo-radiotherapy if required.

The participants were well informed regarding the purpose of the study and their consent was taken before administering the questionnaire and investigation at every stage of treatment. Approval was sought from the Institutional Ethical Committee before starting the study.

Data was analysed using the SPSS-16 trial version. Continuous variables were summarized in terms of means and standard deviations while categorical variables were in the form of frequencies and percentages. Statistical analysis was done by percentages and proportion.

Results

Socio-demographic features: Out of 205 patients included in the study, 201 (98%) were females and 04 (2%) were males. Mean age of patients was 46.53 ± 8.73 years (range 21-70 years) and median age was 45 years. Maximum (40%) numbers of patients were in the age group of 41 -50 years. Age wise distribution confirms the rarity of the disease at the extreme ends. (Fig 1). Among all women, only 3 were nulliparous. Post-menopausal patients 109 (54.3%) were higher than pre-menopausal 96 (45.7 %). Only 7 (3.4%) women presented the family history of malignancy related to breast in first or second order relatives. Majority of the patients had their first child birth at age between 20 -30 years (69.4 %).

Clinical profile: Lump in the Breast was the most common complaint (100%) which brought the patient to consultation and left side was involved in more than half patients (51.7%). Metastatic symptoms like backache, headache, breathlessness, jaundice, distension of abdomen were present in 17.03% cases. (Table 1) In majority (56.8%) of the cases, breast lump was located in upper and outer quadrant of the left breast followed by central quadrant (19%). There were no patients with bilateral lumps. (Table 2) However the node positivity was found more among the upper and lower outer quadrants (46.8 %) with mostly N1 nodes. Maximum patients 125 (61%) had lump size between 2 to 5 cm followed by 61 (28%) cases in which lump size was more than 5 cm. The average size of the tumour was 4.6 cm. Size of the tumour is important parameter as it determines stage of the disease and also the prognosis.

Majority 96 (47.5%) of patients presented between 4 to 6 months of onset of lump and around 7% after 6 months. About 62 % cases had Stage III and Stage IV disease. There were 7 patients who were operated outside for lumpectomy, so their stage could not be determined (Table 3) Lymph nodes were involved in 97 (47%) patients with N1 in 69 (34%), N2 in 7 (3.4%) and N3 in 11 (5.4%).

Histo-pathological features, treatment, complications: FNAC confirmed diagnosis in 194 (94.6%) patients and was inconclusive in 11 patients. Amongst these 11 patients the diagnosis was confirmed by biopsy. Out of 205 patients, 138 (67.3%) patients were operated for Modified Radical Mastectomy (MRM), 16 (7%) patients underwent Breast Conserving Surgery like Lumpectomy, 22 (10.7%) patients presented with locally advanced tumour and hence were started on down staging Neoadjuvant Chemo-radiotherapy and remaining 29 (14.14%) patients who presented in Stage 4 were given palliative chemotherapy. The operated

patients were registered for adjuvant chemo-radiotherapy and followed for any post-operative complications.

The common complications after MRM were cuticular necrosis (49.2 %) and seroma formation (39.8 %). Seroma was drained by aspiration and managed conservatively. (Table 4) Among total 138 patients operated for MRM, 11 had histopathology report suggestive of positive margin involvement (7.3 %). These were registered for post- operative radiotherapy and were followed by regularity.

On histo-pathological examination of specimens, infiltrating ductal carcinoma (74.3%) was the most common subtype followed by the lobular variant (18%). All the male patients had invasive ductal type of picture on histopathology (Table 5). Other variants like nodal involvement, margins of tumour and histo-pathological grades also studied. 60% of the carcinomas were classified as Grade III by the Nottingham system scoring. Grade II constituting 38 % of all the tumours. Grade I was seen in 2% cases. Single case of a metaplastic variant of breast cancer was noted in a 55 year female.

Out of 138 MRM operated patients, 95 were willing for the Immunohistochemistry. Results revealed 43 (45.26%) were positive for ER and 40 (42.10%) were positive for PR. Her2neu was positive in 12 (12.7%) cases. Hormonal treatment was started in those positive for ER/PR in form of Tab Tamoxifen 20mg O.D. for 5 years in pre-menopausal and Anastrazole in post-menopausal patients. Inj Trazutuzumab was given to those patients who were Her2 neu positive.

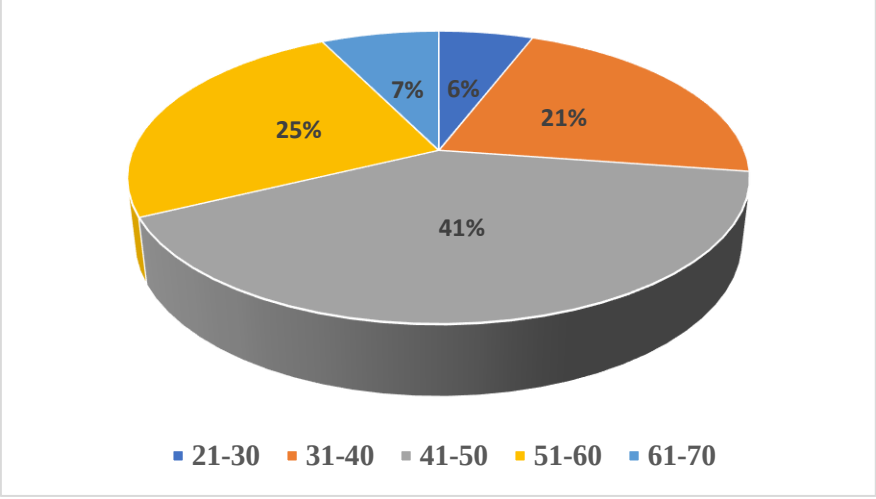

Fig 1: Age-wise distribution of patients in years (N-205)

Table 1: Distribution of Presenting Complaints

Symptoms	No. of patients (N-205)	Percentage

Breast lump	205	100 %
Peau de orange / Skin ulceration	68	33.1%
Pain	41	19.7 %
Discharge	21	10.1 %
Metastatic symptoms	35	17.03%

Table 2: Distribution of Location of Breast Lump

Quadrant	Right Breast	Left Breast	Percentage
Upper Outer	53	63	56.8%
Upper Inner	09	18	13%
Lower Outer	08	07	7.3%
Lower Inner	05	03	3.9%
Central	24	15	19%
Total	205		100%

Table 3: Stage of breast Cancer (TNM Stage)

Stage	Number of patients (N- 198)	Percentage
I	11	9%
II	60	29%
III	98	48%
IV	29	14%
Total	198	100%

Table 4: Post-surgical Complications

Post-operative complications	Total No of patients	Percentage
Cuticular necrosis	68	49.2%
Seroma	55	39.8%
Flap necrosis	21	15.2%
Nerve Injury (Ex :Winging of scapula)	3	2.17%

Vascular Injury (Injury to axillary vein)	3	2.17%
Lymphedema	4	1.44%
Chronic limb pain	16	11.5%
Surgical site infection	5	3.6%
Other Ex : DVT	1	0.72%

Table 5: Histopathological types of MRM specimen

Histopathological type	**Cases (N- 205)**	**Percentage**
Invasive Ductal	152	74%
Invasive Lobular	37	18%
Medullary	11	5.4%
Colloid carcinoma	2	0.9%
Comedo carcinoma	2	0.9%
Other (Rare)	1 (Metaplastic)	0.8%

Discussion

The study was conducted among 205 breast cancer patients.

Socio-demographic features:

In the present study, maximum (40.48%) patients were in age group of 41-50 year but more than 25% of cases were below 40 years of age. *Sangma MB et al* [9] in his study reported that the breast cancer occurred decade earlier in Indian women (40-50 years) than Westerns. Similar findings were seen in studies done by *Gedam MC et al* [10] (40.20%) and *Gupta G et al* [11] (40%). The percentage increased with age reaching a plateau between 40- 50 years of age; thereafter the incidence decreased. The median age at presentation was 45 years which is similar to *Gupta G et al* [11] and *Kamath et al* [12] However *Manoharan N et al* [5] found median age of presentation as 50 years.

In our study, cases in post-menopausal group (54%) were slightly more than pre-menopausal group (46%) and maximum cases were multiparous. *Datkhile KD et al* [2] also found 55% cases in post-menopausal group while *Gupta G et al* [11] found 99% patients multiparous. In the study, only 3.4% women presented the family history of malignancy related to breast in first or second order relatives. *Kamath et al* [12] reported family history in 5.3% of cases while *Antony MP et al*

[13] in 11% of cases. Delayed first pregnancy as a reason for developing breast cancer was not common in our study as majority patients had earlier first pregnancy.

Clinical profile: In the present study, lump in the breast was the presenting complaint in all the patients. Other symptoms were skin changes over lump, ulceration of the skin, pain and nipple discharge or retraction. Axillary nodes were seen in 17% and upper outer quadrant was the commonest (53%) quadrant involved. The reason for this is that upper outer quadrant of breast contained maximum amount of parenchyma. Other researchers also reported same findings in their studies. [10, 11] In 61% patients, the size of tumour was between 2-5 cm and 28% patient had more than 5cm. *Datkhile KD et al* [2] and *Gupta G et al* [11] also found more than 50% cases with tumour size more than 2 cm. In our study majority of the patients (47.5 % cases) presented with symptoms between 4-6 months of onset of symptoms. Late presentation (> 6 months) was also reported by *Hadi N et al* [14] in their study.

Duration of the lump correlated with adverse outcome with those presenting later having advanced T stage, having either T-3 or T-4 lesions or eventually a poor operative risk and prognosis.

In TNM staging 62% cases were stage III and stage IV and nodal involvement was present in 47% cases. According to various studies [15,16] majority of carcinoma breast cases in the West countries report in stages I and II whereas in India nearly 50-60% of cases reported in stage III and IV. [7,17,18] This is because in India women tend to ignore the minor symptoms and do not show up at the hospital until it is unbearable, owing to their household responsibilities. This disparity reveals the advantages of screening techniques and patient education as practiced by western nations. Other contributory factors could be illiteracy, lack of awareness, low socioeconomic status and non-availability of health facility.

Histo-pathological features, treatment and outcome

Cuticular necrosis (49.2 %) and Seroma formation (39.8 %) were the most common post-operative complications in our study which was similar to other studies.[10,19,20] On histo-pathology, 74 % of cases were diagnosed as invasive ductal carcinoma. Invasive duct carcinoma (IDC) is the most common type accounting for 40% to 75% of cases.[2,11,21]

Immunohistochemistry in 95 patients revealed that ER was positive in 45.26 % cases, PR was positive in 42.10% cases, Her2 neu was positive in 12.7 % cases. The results are comparable with studies done by *Datkhile KD et al* [2] and *Rathod VK et al* [17] (ER positive in 41% and 55%, PR positive in 47 % cases with Her2 neu positive in 39% and 14% cases).

Conclusion

The known facts for increased occurrence of BC like advanced age, nulliparity, post-menopausal period, family history and delayed first pregnancy are also found in our study but their preponderance is not high. This suggest that every women irrespective of above factors should be more vigilant towards breast cancer. The late approach to health facility also indicate lack of awareness. So, there is a need to create awareness through health education and early detection of breast cancer. Every women in reproductive age group, should made aware of the simple and effective methods of detecting the disease early like, self-breast examination and they should practice it.

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