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Pattern of breast cancer among low socioeconomic status patients attending tertiary care center in North India-A tenyear data analysis

[1]Ramandeep Singh, [2]Rajiv Devgan, [3]H D Jyoti.

[1]MD. Radiation oncology, Senior Resident (Department of Radiation Oncology, Government Medical College, Amritsar), Mobile number- 09888442518,
e mail id - ramansagoo28@gmail.com

[2]MD. Radiation oncology, Professor and Head (Department of Radiation Oncology, Government Medical College, Amritsar), Mobile number- 09815062950
e mail id – drrajivdevgan@yahoo.co.in

[3]MD. Radiation oncology, Associate Professor (Department of Radiation Oncology, Government Medical College, Amritsar), Mobile number- 09464739009
e mail id - drjyoti.9999@gmail.com

ABSTRACT-

Background- Among females, breast cancer is the most commonly diagnosed cancer and the leading cause of cancer death.

Objective- To study the pattern of breast cancer among low socioeconomic status patients attending a tertiary care hospital (Government medical college, Amritsar).

Materials and methods- A retrospective study was conducted in the department in which data was analysed in terms of demographical profile, stage of presentation, risk factors, histologic type and management strategies.

Results- A total of 1706 patients were studied in the study in ten year period. These were mostly poor and of low socioeconomic status who completed the treatment under Chief Minister Cancer Relief Fund (CMCRF) scheme. The mean age at diagnosis was 50.57+/-10years. Majority of patients were in age group 50-59 years (551 with 32.29%) and 40-49years (531 with 31.12%). Left sided breast carcinoma patients were more in number 913(53.51%) versus right sided as 791(46.36%). 936(54.86%) patients were from urban and 770(45.13%) patients were from rural areas. Male breast cancer patients were 17(1%), among females maximum number i.e.857 (50.23%) presented as postmenopausal followed by 511(29.95%) as perimenopausal followed by 321(18.81%) as premenopausal women. Infiltrating ductal carcinoma is the most common histopathology with 90.62%. Luminal type A comprises 45.72% subtype then 36.10% with Basal subtype followed by 11.43% with Her2neu enriched and 6.74% with Luminal type B subtype. There were 256(15%) patients in whom recurrence or progression of disease occurred.

Conclusion- In this study, breast cancer trend is rising with time and more patients presented in late and advanced stages mostly due to lack of awareness, so we conclude that public health education for early detection of breast carcinoma is necessary and at the same time government schemes like CMCRF helps in bringing more and more patients for free treatment to the government hospitals and thus giving them a chance for good survival.

Keywords- breast cancer, low socioeconomic status patients, tertiary care center, Chief Minister Cancer Relief Fund (CMCRF)

INTRODUCTION-

Breast cancer is a heterogeneous disorder with different pathological and histological characteristics [1].

For both sexes combined, lung cancer is the most commonly diagnosed cancer (11.6% of the total cases) and the leading cause of cancer death (18.4% of the total cancer deaths), closely followed by female breast cancer (11.6%) for mortality. Among females, breast cancer is the most commonly diagnosed cancer and the leading cause of cancer death, followed by colorectal and lung cancer for incidence.Worldwide, there were about 2.1 million newly diagnosed female breast cancer cases in 2018, accounting for almost 1 in 4 cancer cases among women [2]

Locally advanced breast cancer (LABC) constitutes more than 50 to 70% of the patients presenting for treatment.[3] The information on the epidemiology of breast cancer in India is very limited, except for a few reports with limited samples[4].

Breast carcinoma is a multifactorial disease. With the advent of population growth, changes in the lifestyle, and migration from rural to urban areas, there is an increase in the incidence in breast carcinoma in developing countries.[5] In addition to the nonmodifiable risk factors such as genetic mutation, age and family history of breast carcinoma, the other risk factors include reproductive risk factors such as early age at menarche and late age at menopause, nulliparity, older age at first full-term birth, number of children, and duration of breastfeeding.[6,7]

This retrospective study was carried out to know the pattern of breast cancer among low socioeconomic status patients in terms of demographical profile, stage of presentation, risk factors, histologic type and management strategies in a tertiary care centre Government medical college, Amritsar.

MATERIALS AND METHODS-

A retrospective study was conducted in Department of Radiation Oncology, Government Medical College, Amritsar. The patients were taken from 2010 to March 2020. The whole data was taken from registered patient files in our radiation oncology department. A total of 1706 breast cancer patients were enrolled over a period of these ten years. All the cases showing complete profile of the patient that is name, age, sex, address, socioeconomic status by modified kuppuswamy scale criteria, diagnosis as carcinoma breast and morphological site, stage of presentation, histologic type and treatment modilities have been included in this study. Most of the patients were treated under CMRF scheme which included the cost of investigations, chemotherapy, hormonal therapy and radiation therapy. A metastatic workup included a chest x-ray, ultrasonography of the abdomen and pelvis or computed tomography scan of the thorax/ abdomen/ pelvis in selected cases was done. Women with early breast cancer were offered breast conservation surgery(BCS) in the absence of known contraindications and for those who were not eligible for conservation underwent MRM(modified radical mastectomy). In locally advanced breast cancer(LABC) patient, after calculating Body surface area(BSA), neoadjuvant chemotherapy(NACT) was offered to downsize the tumor. Our standard approach for neoadjuvant therapy has been to use the sandwich approach. The neoadjuvant regimen comprised of anthracycline-based therapy (AC [doxorubicin and cyclophosphamide]/EC [epirubicin and cyclophosphamide]/FAC/FEC [5-fluorouracil, doxorubicin or epirubicin, and cyclophosphamide]) for 4 cycles followed by surgery, followed by one of the taxane regimens in the adjuvant setting (3-weekly paclitaxel/docetaxel × 4 cycles). After chemotherapy, women were given

4000cGY/15#/3weeks external beam radiation therapy(EBRT) to the chest wall, supraclvicular fossa, axilla and those with BCS, were given additional 1250cGy/5#/1 week boost to the tumor bed.

Premenopausal women with hormone receptor (HR)-positive disease received 5 years of adjuvant tamoxifen, while postmenopausal women were given 5 years of an aromatase inhibitor. Patients with Her2neu positive were given 12-15 cycles of 3-weekly Inj. Transtuzumab (8mg x wt in kgs-cycle1→6mg x wt. in kgs cycle 2 to 12 or 15).

Follow up was done 3 monthly for the first year, 6 monthly for 2nd to 5th year then yearly to see any recurrence or progression of disease.

RESULTS-

A total of 1706 patients of histologically proven breast carcinoma have been reported to the radiation oncology department at government medical college, Amritsar in these 10 years. The yearly trend showed that there were 110(6.44%) patients reported in 2010, 124(7.26%) patients reported in 2011, 138(8.08%) in 2012, 154(9.02%) in 2013, 164(9.61%) in 2014, 176(10.31%) in 2015, 190(11.13%) in 2016, 206(12.07%) in 2017, 216(12.66%) in 2018, 228(13.36%) in 2019-March 2020.[Figure 1]

Of the total 1706 patients, 1689(99%) were female breast cancer and 17(1.0%) were male breast carcinoma. [Figure 2]

According to Modified kuppuswamy scale criteria for socioeconomic status, most of the patients that is 888(52.05%) were of upper lower class followed by 460(26.96)% with lower class followed by 273(16)% with lower middle class again followed by 51(2.98)% with upper middle and 34(1.99%) with upper class. The patients have mean BSA of 1.34, which depicts poor nutrition status of them.[Figure 3]

The age distribution is depicted in Figure 4. Majority of patients were in age group 50-59 years (551 that is 32.29%) and 40-49years (531 that is 31.12%). The mean age was 50.57+/-10years The youngest patient was of 22 years and the oldest was of 95 years of age. Age group 60-69 years comprised of 319 patients with 18.69%, 30-39years group having 212 patients with 12.42%, 70-79 years group having 45 patients with 2.63%, 20-29 years group with 27 patients (1.58%), 80 & above years group with 21 patients(1.23%).

Patients diagnosed as left sided breast carcinoma were 913(53.51%) versus right sided as 791(46.36%). Two cases was of bilateral breast carcinoma (0.12%).[Figure 5]

The demographic profile revealed that 936(54.86%) patients were from urban and 770(45.13%) patients were from rural areas. [Figure 6]

Out of total 1706 female breast carcinoma patients {as 17(1.0%) were male breast cancer}, maximum number that is 857(50.23%) presented as postmenopausal followed by 511(29.95%) as perimenopausal again followed by 321(18.81%) as premenopausal women. [Figure 7]

Most of the patients that is 1678 in number (98.35%) presented with local or locoregional disease symptoms while 28 patients (1.64%) as metastatic disease in the form of brain and bone metastasis.

The clinical presentation with early breast carcinoma(Stage I,IIA,IIB,IIIA) patients were 722(42.32%), locally advanced breast carcinoma (IIIB, IIIC) were 956(56.03%) and metastatic breast cancer (IV) were 28(1.64%). [Figure 8]

The Immunohistochemistry(IHC) study showed maximum number of patients(780 in number with 45.72%) had Luminal type A subtype followed by 616 patients(36.10%) with Basal subtype which is again followed by 195 patients(11.43%) with Her2neu enriched subtype. 115 patients(6.74%) had Luminal type B subtype.[Figure 9]

Table 1 shows the histopathology of the patients in this study according to which maximum(1546) number of patients had Infiltrating ductal carcinoma with 90.62% followed by 41 cases(2.40%) of Lobular carcinoma and 41 cases(2.40%) of Medullary carcinoma. The other histopathology comprised of 23(1.34%) patients with mucinous variety, 11(0.64%) had ductal carcinoma in situ, another 11(0.64%) had adenocarcinoma, 11(0.64%) had phyllodes carcinoma, 6(0.35%) were having carcinoma in situ with mixed ductal and lobular variety, and 8(0.46%) of metaplastic, 4(0.23%) had anaplastic carcinoma, 2(0.12%) each of spindle cell lesion and neuroendocrine variety.
There were 256(15%) patients in whom recurrence or progression of disease occurred, out of which 30(11.71%) patients had local recurrence, 51(19.92%) patients had loco-regional recurrence and 175(68.35%) patients had progression of disease in the form of either brain, bone liver, lung metastasis.[Table 2]

Figure 1- showing yearly trend of breast cancer patients in the department

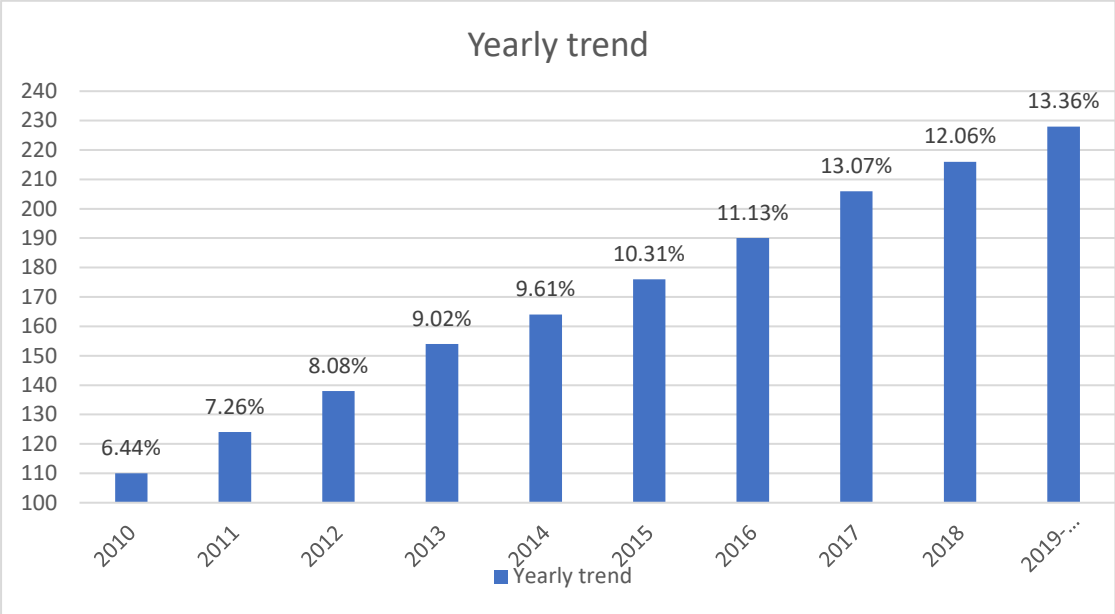

Figure 2- Female versus male breast cancer patients

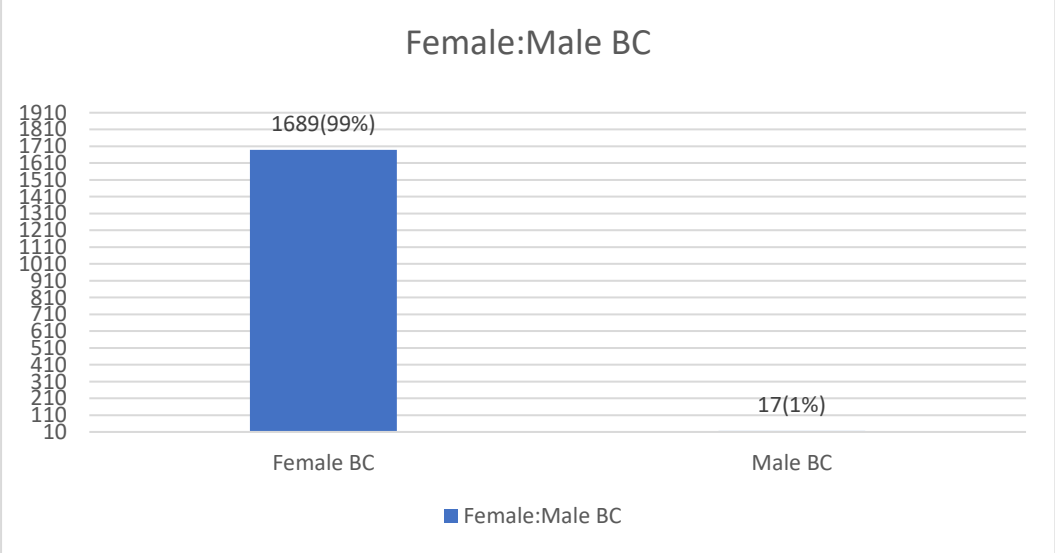

Figure 3-Patients according to modified kuppuswamy socioeconomic status criteria-

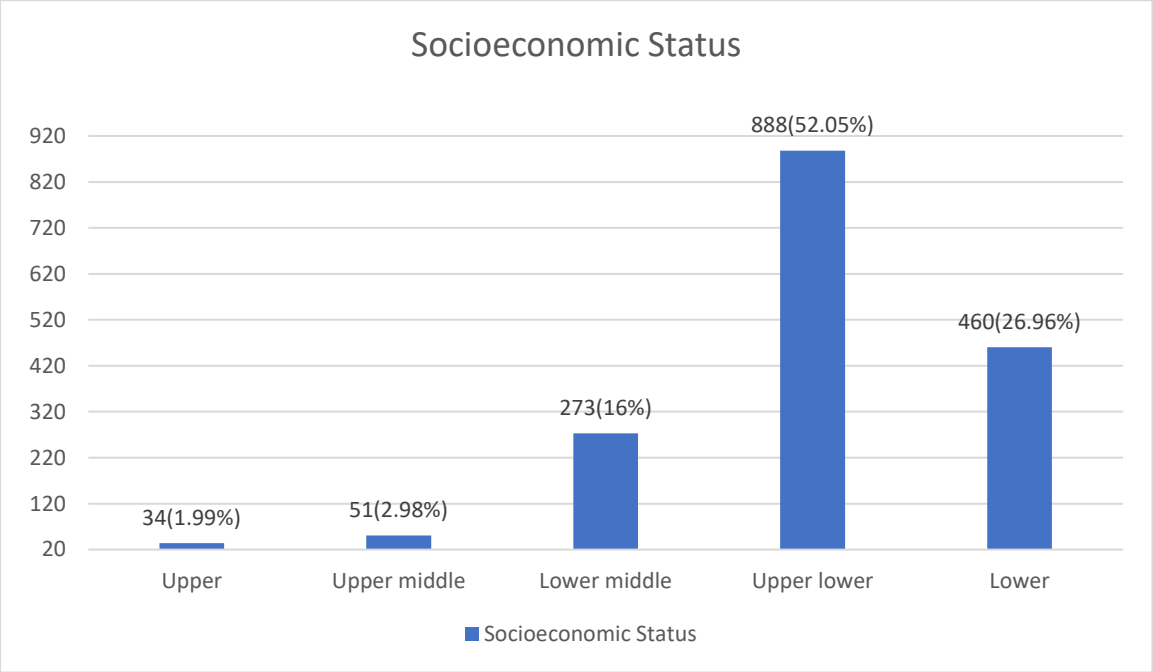

Figure 4- Age distribution of breast cancer patients-

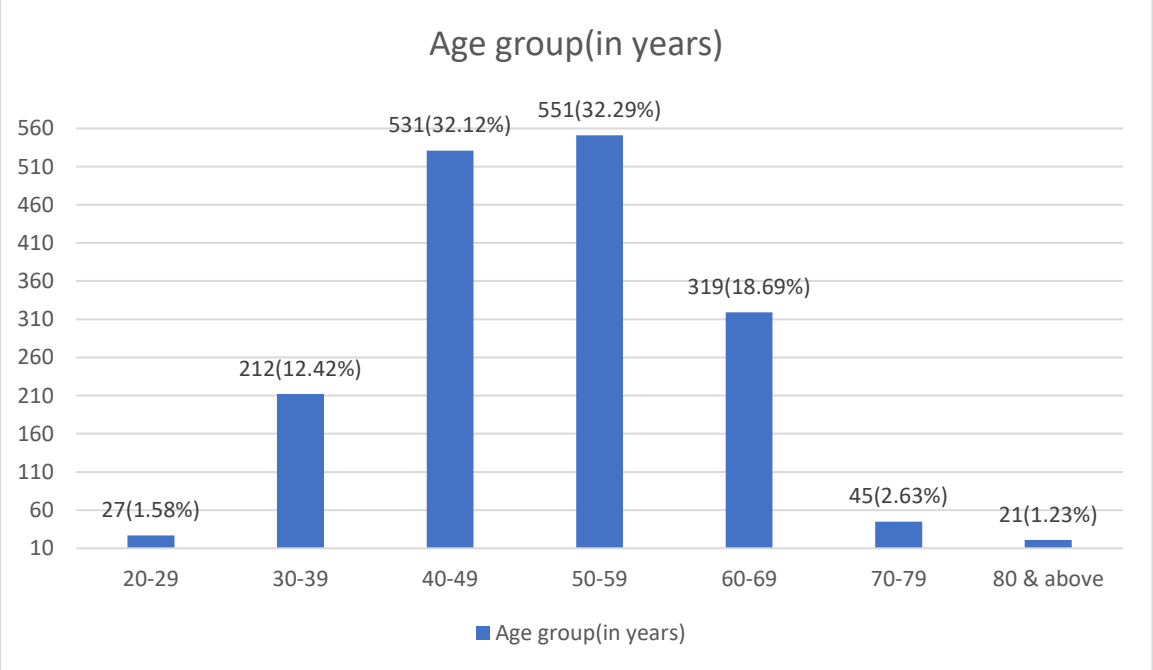

Figure 5- Right versus Left breast carcinoma-

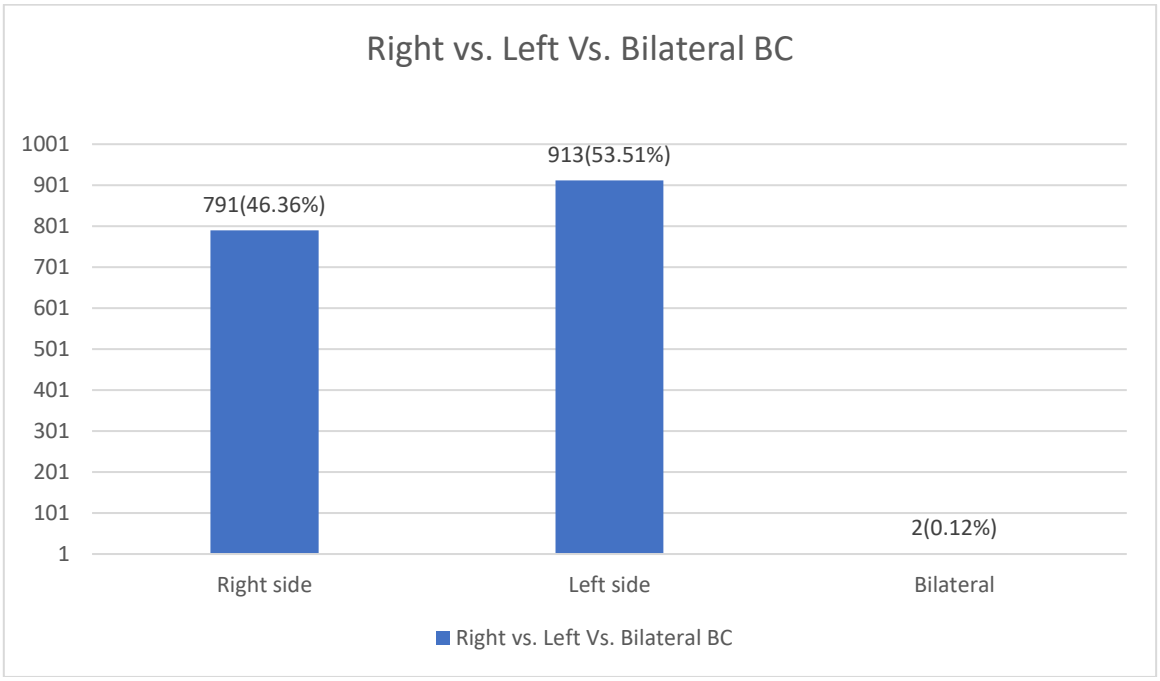

Figure 6- Demographic profile of patients-

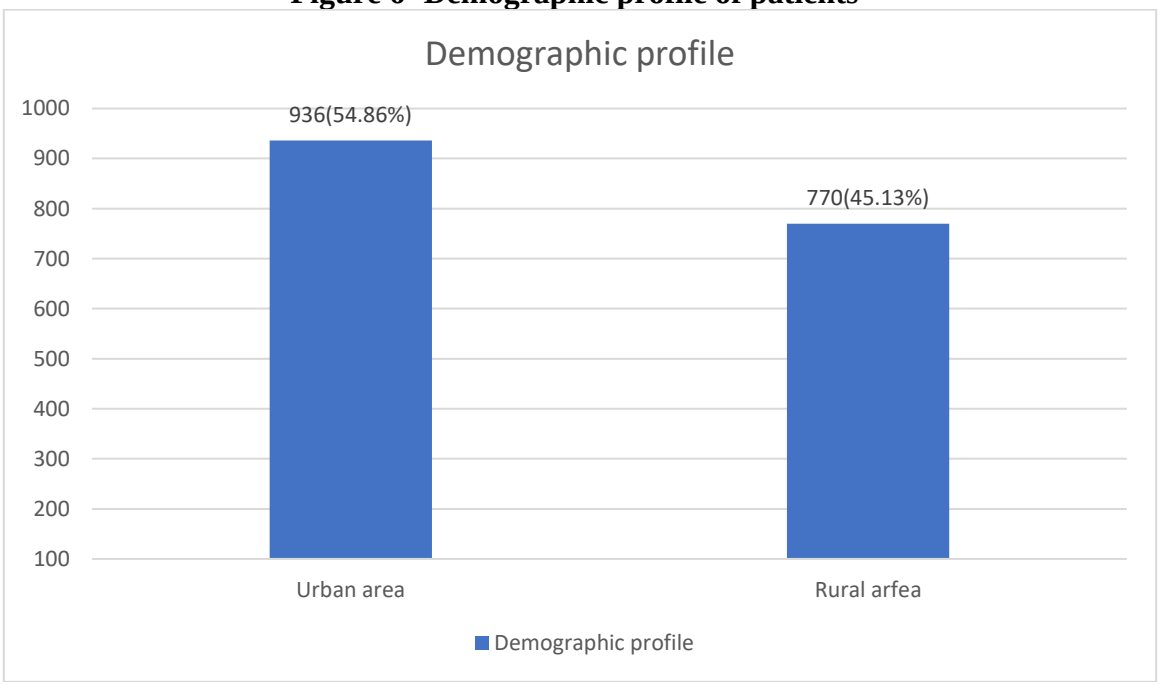

Figure 7- Menopausal status of patients-

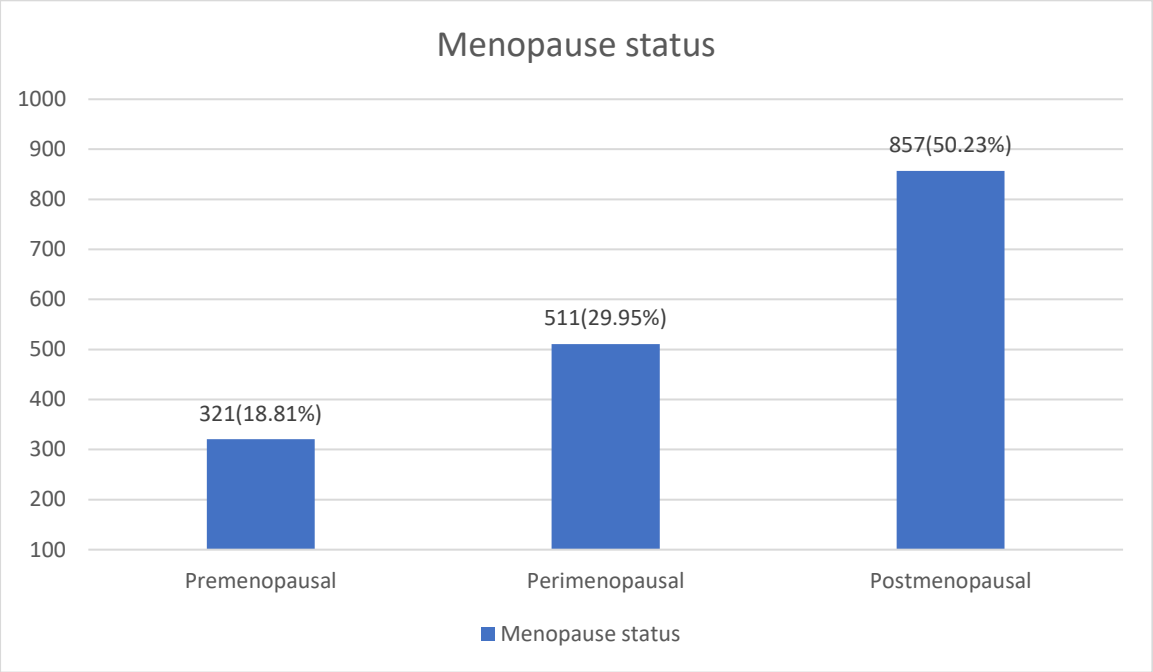

Figure 8- Distribution of Breast carcinoma as per stage-

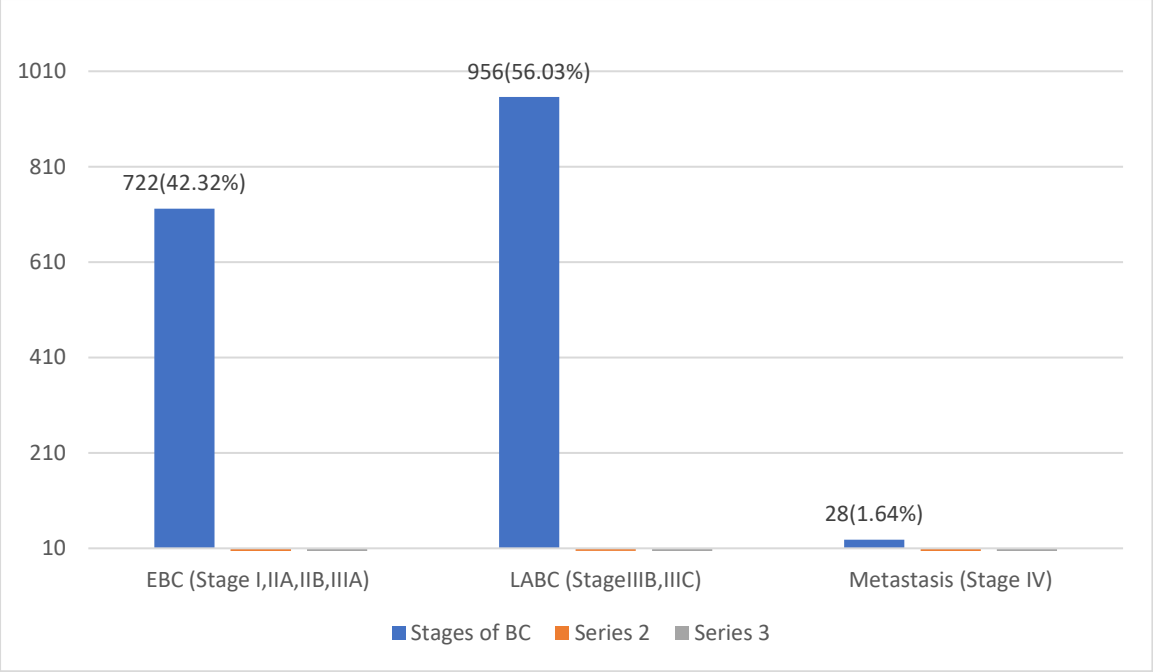

Figure 9- IHC of histopathology-

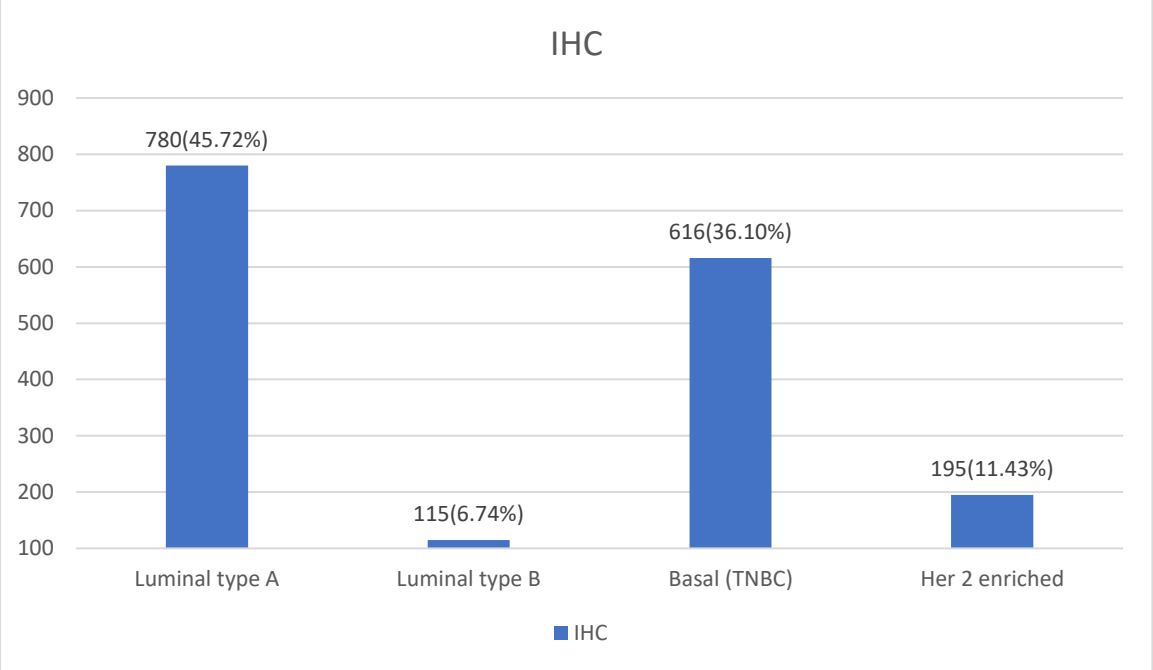

Table 1- Histopathology of breast carcinoma

HPER	Infiltrating ductal carcinoma	Lobular carcinoma	Medullary carcinoma	Mucinous variety	DCIS	Adeno-carcinoma
No. of patients	1546	41	41	23	11	11
Percen-Tage	90.62%	2.40%	2.40%	1.34%	0.64%	0.64%

HPER	Phyllodes carcinoma	Ca In situ with mixed ductal & lobular	Metaplastic carcinoma	Anaplastic carcinoma	Neuroendocrine variety	Spindle cell lesion
No. of patients	11	6	8	4	2	2
Percentage	0.64%	0.35%	0.46%	0.23%	0.12%	0.12%

Table 2- Recurrence and progression of breast carcinoma

		Local recurrence	Loco-regional recurrence	Progression to metastasis
No. of patients	256(15% of total)	30	51	175
Percentage	100%	11.71%	19.92%	68.35%

DISCUSSION-

The aim of this retrospective analysis is to study the epidemiology of low socioeconomic status breast cancer patients at a tertiary care hospital in North India. Reports from the western world show that female breast carcinoma is predominantly seen in the fifth and sixth decade.[8-10] In India, carcinoma breast incidence peaks among women at a younger age as compared to women from Western countries.[11] Research studies conducted earlier in india have observed age at diagnosis of breast cancer between 45 and 50 years.[12,14] We also found almost similar results in our study in which majority of patients are in age group 50-59 & 40-49years.

In the present study, the incidence of breast carcinoma is more on left side which is similar with the previous reports[15,16] which stated that left breast is bulkier as an explanation.

The demographic profile of our study revealed that 936(54.86%) patients were from urban areas which is showing similarity with the previous reports from India as well as United states depicting breast carcinoma as higher incidence in urban population compared to rural population[3,17]. In Sofi NY et al, the sociodemographic profile also contained majority(74%) of patients from urban background.[18]

The incidence of breast carcinoma in males was found to be 1.0%, similar to other reports published in the literature[17,19]. In Nair N et al 2018, the male breast carcinoma incidence was 0.95%.[13] The earlier published reports also showed that the risk of breast carcinoma increases with increasing age of menopause, possibly because the women are exposed to hormones for a longer duration.[20,21] In Nair N et al[13], among early breast cancer group, 44.3% patients were pre+perimenopausal and 54.7% patients were postmenopausal, also in LABC(locally advanced breast cancer) group, 49.3% patients were pre+perimenopausal and 50.7% were postmenopausal. This finding is consistent with our study which shows that 18.81% as premenopausal +29.95% as perimenopausal =48.76% as pre+perimenopausal and 50.23% females as postmenopausal.

In Nair N et al[13], 40.5% patients presented with early breast cancer which is in concordance with our study having 42.32% patients with early breast cancer presentation. In Sofi NY et al[18], 3% of the total patients presented with metastatic disease which is also close to our study having 1.64% patients with metastatic disease. Previous research studies on stage of breast cancer have reported that more than 50% of newly diagnosed patients were presented with stage III or IV breast cancer.[3,22] In the present study, also more than 50% patients presented with stage III or IV.

Infiltrating ductal carcinoma(90.62%) has been found to be the most common histopathologic variety in our study. Similar results have also been shown by research done at some tertiary institutions in the country, South Asian countries and in the United states[23,24,25]

There is a lot of heterogeneity in rates for hormone receptor positivity in the country with rates from 38% to 70%, and for Her2neu, the range is from 16.7% to 36.7%. Hormone receptor negative status was a poor prognostic factor in both early and locally advanced breast cancer in the study cohort. The tumors with triple negative breast cancer (TNBC) were 36% in LABC group.[13] Almost similar results with 36.10% triple negative breast cancer tumors are here in the present study.

In Nair N et al 2018[26], 21.5% patients were metastatic (both de novo and recurrent). Similarly, in this study, 1.64% patients presented as de novo metastasis and 15% patients landed into recurrence or progression of disease.

CONCLUSION-

The aim of this retrospective study is to see the trend of breast carcinoma with time and to study the various epidemiological factors. We see that breast cancer trend is rising among females. Furthur, more and more cases are presenting in late and advanced stages, which is mostly due to lack of awareness. So, there is a need for public health education specially in rural areas for early detection and treatment and also to develop the cost effective screening modalities like breast self examination for early detection. Government schemes like CMRF for cancer patients helps in bringing more and more patients for free treatment to the government hospitals. MRM is the gold standard for the management of breast carcinoma. In view of the rising incidence of breast carcinoma and the prevailing controversies in its management, it is recommended that they should preferably be well managed by the tertiary hospitals.

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