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Study of Role of Hormonal Status in the Management of Breast Carcinoma in a Hospital Based Study

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ABSTRACT
To assess the role of hormonal status in the management of breast carcinoma patients. Sixty-eight breast cancer females were selected. The confirmed cases of breast carcinoma patients were proceeded with surgical management followed by adjuvant/neoadjuvant therapy/palliative therapy according to their ER/PR/HER/2 NEU status. After surgery biopsy sent for HPE and IHC for their ER/PR/HER2/neu status chemotherapy/radiotherapy was given. The most common molecular subtype of breast cancer found in our study was Luminal A accounting for 48.53% of the cases. This was followed by Basal type (26.47%) and Luminal B type (20.59%). The most common histology found on final HPE analysis was invasive carcinoma breast no specific type accounting for 72.06% of the patients. This was followed by infiltrating ductal carcinoma accounting for 23.53% of the patients. Majority of ER positive cases 22 out of 48 were in the age group of 50-59 years. Majority of PR positive cases 14 out of 34 were in the age group of 50-59 years. 50% of the patients belonged to luminal A category, 26.47% of the patients belonged to triple negative category, 20.58% of the patients belonged to luminal B category and 2.94% of the patients belonged to Her2neu rich category. Patients with elderly age group are more likely to have hormone receptor status positivity. Hormone receptor-positive tumors are more likely to be larger than those with hormone receptor-negative tumors. Hormone receptor-positive tumors are also more likely to have more lymph node metastasis clinically as well as histologically, whereas according to the literature states the reverse is true.

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Key Words
Breast cancer, hormone receptor, ER positive, breast carcinoma

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INTRODUCTION

Breast cancer is one of the most common cancers occurring in women worldwide and accounts for nearly a quarter of all cancers. Breast cancer has ranked number one cancer among Indian females with age adjusted rate as high as 25.8 per 100,000 women and mortality 12.7 per 100,000 women[1]. The age adjusted incidence rate of breast cancer was found to be as high as 41 per 100,000 women in Delhi, followed by Chennai (37.9), Bangalore (34.4) and Thiruvananthapuram District (33.7)[2].

In India, although age adjusted incidence rate of carcinoma breast is lower (25.8 per 100 000) than United Kingdom (95 per 100000) but mortality is almost as the level (12.7 vs 17.1 per 100 000) in United Kingdom[3]. There is a significant rise in the incidence of carcinoma breast and carcinoma-associated morbidity and mortality in Indian subcontinent as described by many global and Indian studies. The lifetime risk of developing carcinoma breast is approximately 1 in 8% to 1 in 12% and the risk of death in a person's lifetime is approximately 2.4%[4].

Molecular markers are type of protein receptors, with the capability of attaching to hormones. Those being expressed by cancerous cells are used to determine the response to specific therapy. Molecular markers used in cancer detection are both proteins and modified sequences of DNA in cancer tissue. Furthermore, specific drugs or other preventive measures like an antibody are used in a suitable targeted therapy to block the growth and the metastatic spread of doppelgängers of neoplastic cells without destroying the healthy cells[5]. The assessment of hormone receptor status and categorizing the treatment according to the hormone receptor status has become the gold standard of care. Hormone receptor status, that is the estrogen and progesterone receptor is now the basic minimum requirement, in managing and treating breast cancer patients[6]. In this study conducted at Sree Mookambika Institute of Medical Sciences, a tertiary health care centre in Kanyakumari District, Tamil Nadu, we aim to demonstrate the incidence of hormone receptor positivity in patients with carcinoma breast and its impact on the management of these patients.

MATERIALS AND METHODS

After considering the utility of the study and obtaining approval from ethical review committee, we selected sixty- eight breast cancer females. Patients' consent was obtained before starting the study. Purposive sampling technique was used.

Data such as name, age, etc. was recorded. The confirmed cases of breast carcinoma patients were proceeded with surgical management followed by adjuvant/neoadjuvant therapy/palliative therapy according to their ER/PR/HER/2 NEU status. After surgery biopsy sent for HPE and IHC for their ER/PR/HER2/neu status chemotherapy/radiotherapy was given. The results were compiled and subjected for statistical analysis using Mann Whitney U test. p-value less than 0.05 was set significant.

RESULTS

The youngest patient was aged 32 years and oldest was 72 years. The median age was 52 years. Average age of presentation was 52.42 years (Table 1).

97.06% of the patients were married and 2.94% of patients were unmarried. The most common complaint of the patient was only lump in their breast which was presented by 28 cases (100%), second most common symptom was pain in the lump present in 7 cases (10.29%), the other complaints like ulceration with lump present in 1 case (1.47%), lump with ulceration and nipple discharge present in 1 case (1.47%). Out of the total 68 patients 7 (10.39%) presented with duration of 2 months or less. 59 patients (86.76%) presented with duration of more than 2 months upto 6 months and 2 patients (2.94%) presented with duration of more than 6 months. Out of 68 patients skin involvement by the tumor was present in 16 cases which accounts to 23.53%. Axillary lymph nodes were involved in 54 cases which accounts for 79.41%. out of 68 patients 44 (64.71%) attained menarche before the age of 13 years and 13 (35.29%) attained menarche after the age of 13 years. The least age of menarche is 11 year and highest age of menarche is 15 years. Sixty two had exclusively breast fed after their pregnancy which accounts for 91.18%. Whereas 6 patients had never breast fed which accounts for 8.82% of the patients. 51 patients had attained menopause which accounts for 75.00% whereas 17 (25.00%) patients were yet to attain menopause. Majority of patients were having two or more children. Seven of the women were nulliparous. All parous women breast fed their all children for at-least more than six months. The difference was significant ($p<0.05$) (Table 2).

The most common surgery performed was right modified radical mastectomy accounting for 39.71% of the patients. This was followed by left modified radical mastectomy (39.71%), right breast conservative surgery (11.76%), left breast conservative surgery (7.35%) and a left toilet mastectomy (1.47%.) (Fig. 1).

Table 1: Age incidence

Age groups	No of cases	Percentage
30-39	4	5.88
40-49	22	32.35
50-59	29	42.65
60-70	12	17.65
>70	1	1.47
Grand total	68	100.00
Mean	52.4265	
SD	9.5438	

SD: Standard deviation

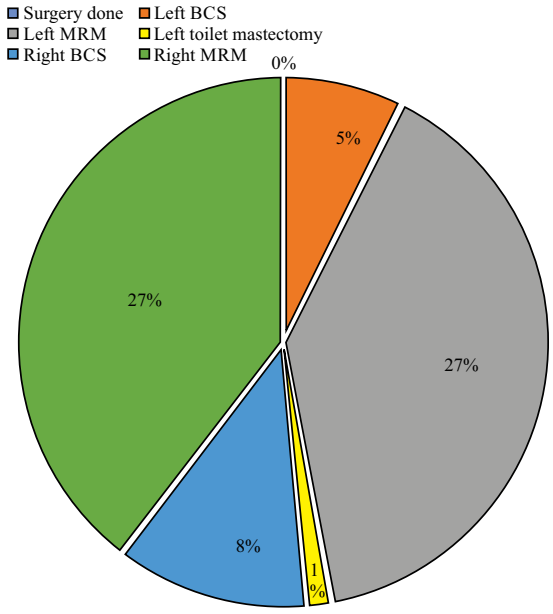

Fig. 1: Type of surgery done

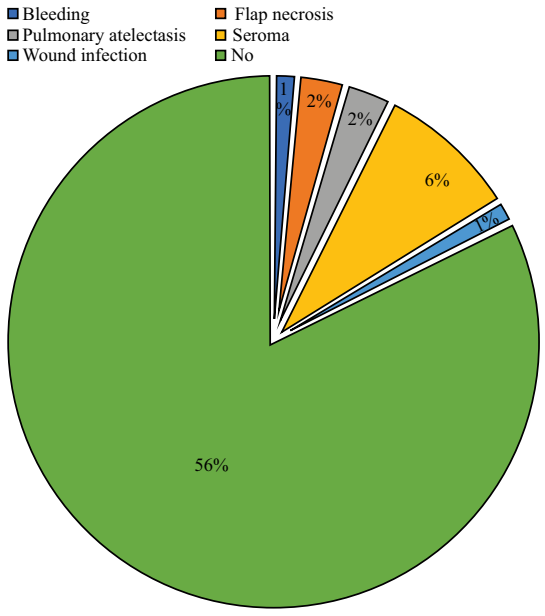

Fig. 2: Post-operative complications

The most common complication amongst our patients was seroma formation which occurred in 8.82% of the cases. This was followed by pulmonary atelectasis occurring in 2.94% of the patients (Fig. 2).

The most common molecular subtype of breast cancer found in our study was Luminal A accounting for 48.53% of the cases. This was followed by Basal type (26.47%) and Luminal B type (20.59%) (Table 3).

The most common histology found on final HPE analysis was invasive carcinoma breast no specific type accounting for 72.06% of the patients. This was followed by infiltrating ductal carcinoma accounting for 23.53% of the patients (Table 4).

Table 2: Assessment of parameters

Parameters/variables	Numbers
Marital status	
Married	66
Unmarried	2
Complaint	
Lump	68
Lump+pain	7
Lump+ulcer	1
Lump+ulcer+discharge	1
Duration of symptoms (months)	
<2	7
2-6	59
>6	2
Skin involvement	
Yes	16
No	52
Axillary lymph node involvement	
Yes	54
No	14
Age of menarche (years)	
<13	44
>13	24
Exclusive breast feeding	
Yes	62
No	6
Age of menopause	
Attained	51
Not attained	17
Parity index	
P1L1	13
P2L2	18
P3L2	9
P3L3	14
P4L4	7
Nullipara	7

Table 3: Molecular subtype

Molecular subtype	No. of cases	Percentage
Basal	18	26.47
HER2 positive	2	2.94
Luminal A	33	48.53
Luminal B	14	20.59
Luminal B Like	1	1.47

Table 4: Post-operative histopathology

Postoperative HPE	Cases	Percentage
Mucinous carcinoma	1	1.47
Invasive carcinoma breast NST	49	72.06
Infiltrating lobular carcinoma	2	2.94
Infiltrating ductal carcinoma	16	23.53

Table 5: Correlation between age and ER/PR status

Age groups	ER	PR	HER2 NEU	Grand total
30-39	3	3	0	6
40-49	15	13	3	31
50-59	22	14	8	44
60-70	8	4	4	16
>70	0	0	0	0
Grand total	48	34	15	97

Table 6: Correlation between ER/PR/Her 2 Neu status and their distribution

ER, PR and HER2 NEU distribution of cases	Cases	Luminal status	Percentage
ER+, PR+, HER2 NEU-	34	Luminal A	50.00
ER+, PR-, HER2 NEU+	14	Luminal B	20.58
ER-, PR-, HER2 NEU+	2	Her 2-neu positive	2.94
ER-, PR-, HER2 NEU-	18	Triple negative	26.47

Majority of ER positive cases 22 out of 48 were in the age group of 50-59 years. Majority of PR positive cases 14 out of 34 were in the age group of 50-59 years (Table 5).

50% of the patients belonged to luminal A category, 26.47% of the patients belonged to triple negative category, 20.58% of the patients belonged to luminal B category and 2.94% of the patients belonged to Her2neu rich category (Table 6).

DISCUSSIONS

The most common cancer amongst females in India and worldwide is breast cancer. Although, self-breast examination is a simple and effective method of diagnosing breast cancer, patients in India present at an advanced stage due to illiteracy, unawareness and social stigma. There has been ongoing research on the treatment and prognosis of breast cancer throughout the world including India[7]. Classifying patients based on their positivity for ER/PR receptor status is important for prescribing chemotherapy drugs in the adjuvant setting. Koonmee *et al*.[8] and Almasri and Hamad[9] found significant relationship between age and ER and PR status.

In our study the most common complaint of the patient was only lump in their breast which was presented by 28 cases (100%), second most common symptom was pain in the lump present in 7 cases (10.29%), the other complaints like ulceration with lump present in 1 case (1.47%), lump with ulceration and nipple discharge present in 1 case (1.47%). Out of the total 68 patients 7 (10.39%) presented with duration of 2 months or less. 59 patients (86.76%) presented with duration of more than 2 months upto 6 months and 2 patients (2.94%) presented with duration of more than 6 months. In Almasri and Hamad *et al*.[9] study no correlation was detected between grade of tumor and expression of ER and PR ($p = 0.76$ and $p = 0.32$).

We observed that out of 68 patients skin involvement by the tumor was present in 16 cases which accounts to 23.53%. Axillary lymph nodes were involved in 54 cases which accounts for 79.41%. It was found that 51 patients had attained menopause which accounts for 75.00% whereas 17 (25.00%) patients were yet to attain menopause. Majority of patients were having two or more children. Seven of the women were nulliparous. All parous women breast fed their all children for at-least more than six months. Azizun-Nisa *et al*.[10] study showed a significant correlation between the size of tumor and positivity of ER and PR.

The most common molecular subtype of breast cancer found in our study was Luminal A accounting for 48.53% of the cases. This was followed by Basal type (26.47%) and Luminal B type (20.59%). Koonmee *et el*.[8] study showed that there is the smallest chance of tumor size between 2-5cm being ER and PR negative which was 38.2 and 45.98%, respectively. The tumor size of >5 cm had more chances of ER (69.23%) and PR negative (69.23%)

The most common histology found on final HPE analysis was invasive carcinoma breast no specific type accounting for 72.06% of the patients[11]. This was followed by infiltrating ductal carcinoma accounting for 23.53% of the patients. Majority of ER positive cases 22 out of 48 were in the age group of 50-59 years[12]. Majority of PR positive cases 14 out of 34 were in the age group of 50-59 years. 50% of the patients belonged to luminal A category, 26.47% of the patients belonged to triple negative category, 20.58% of the patients belonged to luminal B category and 2.94% of the patients belonged to Her2neu rich category. Helin *et al*.[13] where majority of cases of invasive carcinoma breast no specific type were positive for ER and PR.

CONCLUSION

Patients with elderly age group are more likely to have hormone receptor status positivity. Hormone receptor-positive tumors are more likely to be larger than those with hormone receptor-negative tumors. Hormone receptor-positive tumors are also more likely to have more lymph node metastasis clinically as well as histologically, whereas according to the literature states the reverse is true. But considering the number of involved lymph nodes, hormone receptor-positive tumors are more likely to have 1-3 lymph nodes as compared to tumors which are hormone receptor-negative which are more likely to have more than 3 lymph node metastasis. No clear difference was demonstrated between hormone receptor status and grade of the tumor.

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