Original Research Article

Incidence of triple receptor status (ER, PR, HER-2) in patients undergoing mastectomy in MMC and RGGGH, Chennai, India during 2010-2014: a prospective and retrospective study

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ABSTRACT

Background: Breast cancer is the most common of all cancers and is the leading cause of cancer deaths in women worldwide, accounting for about 1.5% of all deaths. A recent study in India revealed that 1 in 28 women develop breast cancer during their lifetime. Objective was to study the incidence of receptor status in patients who underwent mastectomy for carcinoma breast in Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai, India.

Methods: All women with carcinoma breast who had undergone a mastectomy in Rajiv Gandhi Government General Hospital in the past 5 years and their resected specimen tested for receptor status by pathologists. Estrogen receptor, Progesterone receptor, Her2/neu receptor by using special kits.

Results: The most common type was found to be ER+ PR- Her2- and the least common was the Triple Positive type. Estrogen Receptor alone was positive in 63 patients. It was common for age groups 41-50 years and 31-40 years. Progesterone Receptor alone was positive in 17 patients. It was seen in age groups 51-60 years, 31-40 years, and 41-50 yrs. Her2 neu receptor alone was positive in 20 cases. It was most common in the age group 31-40 years (50% cases). Both ER and Her2/neu receptor were positive in 20 patients. The highest was among the age groups 41-50 years (35%) & 31-40 years (30%). All the three receptors were found to be positive in 8 cases with the highest being in the age group 41-50 years (4 cases) followed by 31-40 years (3 cases) and 51-60 years (1 case).

Conclusions: The incidence of Progesterone receptor positivity was 32.5%. It was higher in postmenopausal women (36.25%) compared to premenopausal women (30%).The incidence of Her2/neu receptor positivity was found to be 32.5%. It was equally distributed in premenopausal and postmenopausal women (32.5%). The most common receptor subtype was ER+ve, PR-ve, Her2/neu-ve contributing 31.5%.

Keywords: Breast cancer, Estrogen receptor, Menopause, Progesterone receptor activity

INTRODUCTION

Breast cancer is the most common of all cancers and is the leading cause of cancer deaths in women worldwide, accounting for about 1.5% of all deaths.[1] A recent study in India revealed that 1 in 28 women develop breast cancer during their lifetime. This is higher in urban areas accounting for 1 in 22 women compared to rural areas where it is much lower at 1 in 60 women. In India, the average age of the high-risk group is 43-47 years, whereas, in the west, those aged 53-57 years are more prone.[2] The overall incidence of breast cancer is on the rise as a result of an increase in the lifespan, lifestyle changes and improved survival from other diseases.

Despite this, the mortality is on the decline as a result of early detection by screening and improvements in therapy. Current treatment is guided by insights into breast cancer biology with an increase in the ability to define disease biology and status in individual patients and the availability of improved treatment modalities.[3] This is a prospective and retrospective observational study conducted at Rajiv Gandhi Government General Hospital, Chennai. The receptor status (namely ER, PR, HER 2 neu) of mastectomy specimen of those women operated for carcinoma breast were obtained and analyzed to determine the incidence of receptor status in the study population.

METHODS

This is a prospective and retrospective study done in patients with biopsy-proven carcinoma breast who had undergone Mastectomy in Rajiv Gandhi Government General Hospital. The overall sample size was 200 patients.

Inclusion criteria

All women with carcinoma breast who had undergone a mastectomy in Rajiv Gandhi Government General Hospital in the past 5 years and their resected specimen tested for receptor status by pathologists.

Exclusion criteria

Those patients in whom the receptor status of mastectomy specimen was not studied or not available. Parameters studied: Estrogen receptor, Progesterone receptor, Her2/neu receptor by using special kits.

RESULTS

Most of the patients belonged to the age groups 31-40 years (70 pts), 41-50 years (64pts) and 51-60 years (44 pts).
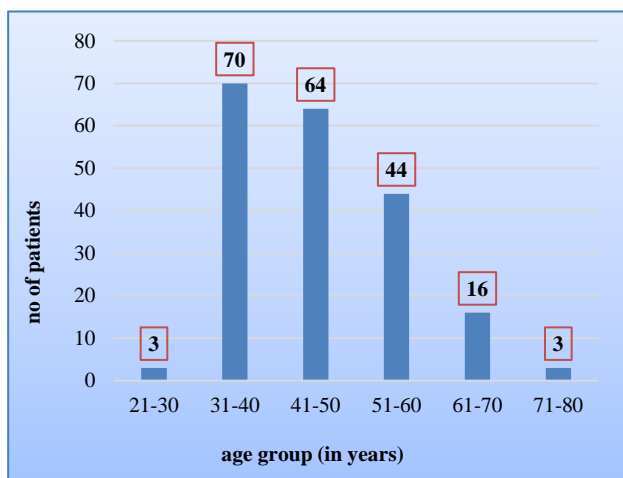

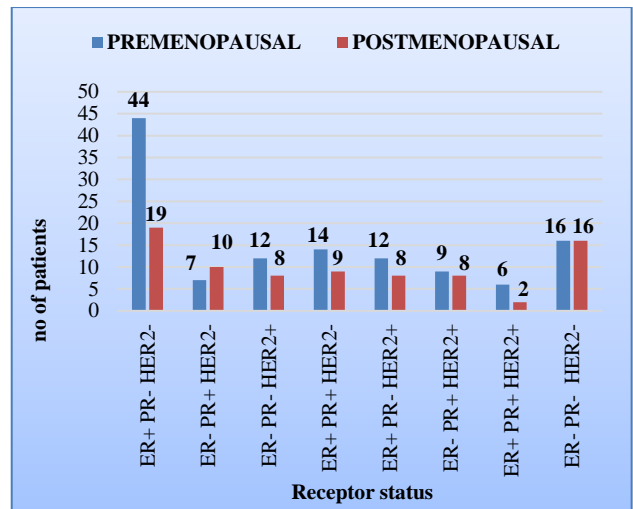**Figure 1: Age distribution.**

Figure 2: Receptor status among patients.

The most common type was found to be ER+ PR- Her2- and the least common was the Triple Positive type. Estrogen Receptor alone was positive in 63 patients. It was common for age groups 41-50 years and 31-40 years. Progesterone Receptor alone was positive in 17 patients. It was seen in age groups 51-60 years, 31-40 years, and 41-50 years. Her2 neu receptor alone was positive in 20 cases. It was most common in the age group 31-40 years (50% cases). Both ER and PR were positive in 26 cases and the highest was in the age group 31-40 years (almost 40%). Both ER and Her2/neu receptor was positive in 20 patients. The highest was among the age groups 41-50 years (35%) and 31-40 years (30%). Both PR and Her2 neu receptor were positive in 17 cases. The highest was among the age group 51-60 years (6 cases) followed by 41-50 and 31-40 years (5 cases each). All the three receptors were found to be positive in 8 cases with the highest being in the age group 41-50 years (4 cases) followed by 31-40 years (3 cases) and 51-60 years (1 case). Estrogen receptors were positive in 57% of the study population. Progesterone receptors were positive in 32.5% of the study population. Her2-neu receptors were positive in 32.5% of the study population.
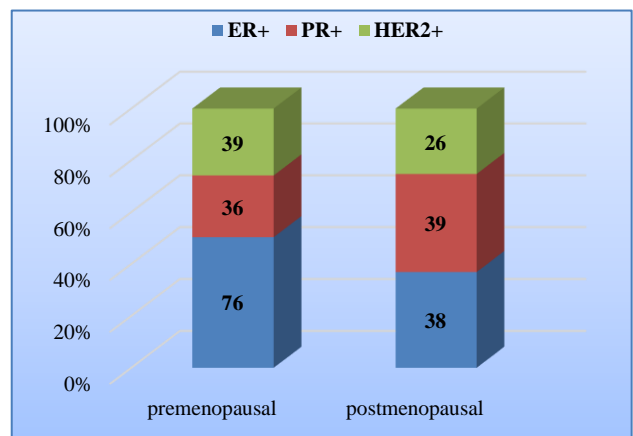

Figure 2: Receptor status among patients.

The relative proportion of estrogen receptor positivity was high among premenopausal women whereas that of progesterone receptor was comparatively high among postmenopausal women. Her2 neu receptor was almost equally distributed among the two groups. The incidence of estrogen receptor is high in pre-menopausal age group whereas that of progesterone receptor status in postmenopausal women. The her2/neu receptor is equally distributed between the two groups.

DISCUSSION

The study aims at determining the incidence of receptor positive status in the mastectomy specimen of women operated for breast cancer in our hospital.[4] 200 women who had been operated for breast cancer were selected for my study. Out of them, 120 (60%) were premenopausal women and 80 (40%) were postmenopausal women. As per published literature, the incidence of receptor positivity varies in people of different races and ethnicity. The incidence of Estrogen and Progesterone receptor positivity increases with age and this is greater for progesterone than for estrogen receptors.[5] Her2 positive and triple negative cancers tend to present at an earlier age. In present study, the overall receptor positivity rate including both individual and combined status was 57 %, 32.5% and 32.5% for ER, PR, HER2/neu receptors respectively. Overall, the most common subtype was ER+ PR- HER2- contributing 31.5% of cases.[6] The least common type was Triple positive accounting for 4% of cases. The same was true for either of the two groups as well. ER+ tumors were more common in the younger age groups (100% in 21-30 years, 61% in 41-50 years, 60% in 31-40 years.) and also in 71-80 years (67%). PR+ tumours were common in the age groups 21-30 years (67%), 51-60 years (45%), 31-40 years (33%) and 41-50 years (27%).[7] Her2/neu positive tumors were almost equally distributed in all age groups contributing around 30% in each (except in 21-30 age group in whom none were positive).[8] Triple negative tumors contributed for 16% of all cases. ER, positivity was proportionately more among premenopausal women (63.33% vs 47.5%), whereas PR positivity was proportionately more among postmenopausal women (36.25% vs 30%). Her2/neu receptors were equally distributed among both the groups (32.5%).[9,10]

CONCLUSION

The incidence of Estrogen receptor positivity was found to be 57%. It was higher in premenopausal women (63.33%), whereas in postmenopausal women it was 47.5%. The incidence of Progesterone receptor positivity was 32.5%. It was higher in postmenopausal women (36.25%) compared to premenopausal women (30%). The incidence of Her2/neu receptor positivity was found to be 32.5%. It was equally distributed in premenopausal and postmenopausal women (32.5%). The most common receptor subtype was ER+ve, PR-ve, Her2/neu-ve contributing 31.5%. The least common receptor subtype was Triple positive constituting 4%. The incidence of Triple negative receptor status was found to be 16%.

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