



## ESTROGEN RECEPTOR, PROGESTERONE RECEPTOR AND HER-2 RECEPTOR STATUS OF BREAST CANCER PATIENTS OF SOUTHERN INDIA: A SINGLE INSTITUTIONAL STUDY

Rajasekaran Pooruli Neelakantan and \*Jebasingh joseph

Department of Medical Oncology, Madurai Medical College, Madurai, Tamilnadu, India

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### ABSTRACT

**Context:** There is a paucity of any significant data on the estrogen receptor (ER), Progesterone receptor (PR) and Her-2 receptor status of breast cancer patients from the eastern part of India.

**Aims:** This study aims to document the ER, PR and Her-2 status of breast cancer patients in the south Indian population, as catered by a premier tertiary care hospital in Madurai.

**Subjects and Methods:** All breast cancer patients registered between January 1, 2016 and December 31, 2018, in the Department of Medical Oncology, of Government Rajaji Hospital, Madurai, who had at least undergone a core biopsy or surgery, were analyzed retrospectively for documentation of their ER, PR and Her-2 status, using the 2010 American Society of Clinical Oncology/College of American Pathologists (ASCO/CAP) interpretation guidelines.

**Results:** Over a period of 2 years, a total of 427 patients were included for the study. A total of 395 (92.5%) patients had their ER, PR and Her-2 data available for evaluation. ER and PR positive was seen in 138 (32.5%) patients, ER and PR negative in 179 (42%) patients, ER positive and PR negative in 29 (6.7%) patients, and ER negative and PR positive results was found in 17 (3.98%) patients. Her-2 was positive in 89 patients (20.8%). Triple Negative status was seen in 158 patients (37%)

**Conclusions:** This is one of the first single-institutional documentation of ER, PR and Her-2 status from southern India, having a modest number of patients and one of the earliest documentations using the latest ASCO/CAP interpretation guidelines. These findings resemble the data from other parts of India and also reiterate the fact that majority of the Indian breast cancer patients are still ER and PR negative and close to 40% of them are Triple-negative which carries a poor prognosis.

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### INTRODUCTION

In view of an unmet need, both in terms of estrogen receptor (ER) progesterone receptor (PR) and Her-2 receptor status reporting from the southern part of, this study was envisaged for a single-institutional documentation of the hormone receptor status of breast cancer patients of the southern region of the country, following the 2010 ASCO/CAP interpretation guidelines.

### SUBJECTS AND METHODS

The study was undertaken in a tertiary care hospital in Madurai, Government Rajaji Hospital. A nonfunded and epidemiological nature of the study deemed an ethical committee clearance unnecessary, as per the institutional protocols. The center was so chosen that its draining patient population was representative of the entire southern part of

and December 31, 2018, who had at least undergone a core biopsy or surgery for their disease were included in this study. They were analyzed retrospectively for documentation of their ER and PR status, using the 2010 ASCO/CAP interpretation guidelines. The data were prepared on an Excel sheet and analyzed manually for the interpretation of the results.

### RESULTS

Over a period of 2 years, 427 breast cancer patients were analyzed. Out of these, 269 (62.9%) patients underwent surgery and 158 (37.01%) patients had a core biopsy. ER, PR and Her-2 data of 395 (92.5%) patients were available for evaluation. The ER and PR evaluations were done in the Departments of Pathology by immunohistochemistry. The kits used for assay were the standard approved kits, as available in the respective teaching hospitals over the concerned study period. The results were interpreted as positive when more than or equal to 1% of tumor cells showed positive nuclear staining, as per the ASCO/CAP interpretation guidelines 2010.

\*Corresponding author: **Jebasingh joseph**

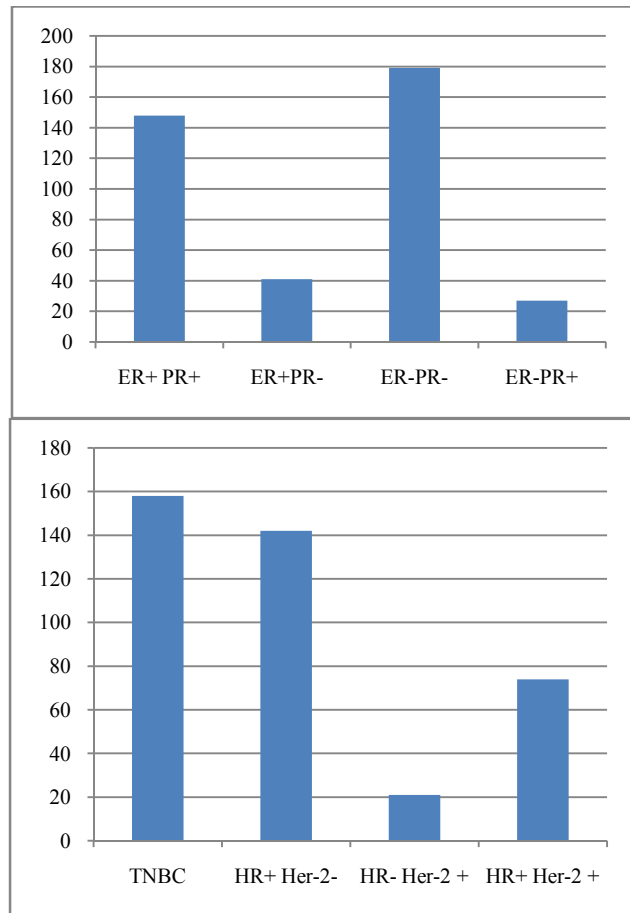
Department of Medical Oncology, Madurai Medical College, Madurai, Tamilnadu, India

The results of the ER and PR status were as shown in Table 1 and Figure 1.

**Table 1** Results of estrogen receptor/progesterone receptor status

Receptor	Gapstur <sup>15</sup> USA	Desai <sup>16</sup> India, West	Suvarchala <sup>14</sup> India, South	Kaul <sup>13</sup> India, North	Present study India, East
Patients	13,239	798	64	55	425
ER positive/PR positive (%)	44-59	25	32.81	16.6	37.92
ER negative/PR negative (%)	20-35	46.5	42.19	46.2	48.36
ER positive/PR negative (%)	12-14	7.4	14.06	-	8.6
ER negative/PR positive (%)	6-8	21.1	10.94	-	5.21

ER=Estrogen receptor, PR=Progesterone receptor



**Figure 1** Results of estrogen receptor/progesterone receptor status from Madurai. The reasons identified for the unavailability of ER and PR reports in 32 (7.49%) patients were financial constraints, loss of paraffin blocks, and poor embedding of tissue to the available blocks.

## DISCUSSION

The relevance of ER and PR status as a predictive marker in breast cancer patients has been established beyond doubt for the last few decades. As per the 2010 ASCO/CAP guidelines, nuclear staining of more than or equal to 1% cells is the current standard to interpret a positive result.[1]

Data from the US suggest that around 44%–59% patients were both ER and PR positive, and only 20%–35% were negative for both ER and PR.[2] The Indian data,[3,4,5,6] on the other hand, suggest a larger number of patients negative for both ER and PR status (42%–48%) [Table 2].

**Table 2** Comparative table showing estrogen receptor/progesterone receptor status reports from the USA and different parts of India (n=825)

Receptor status	Number of patients (%)
ER positive/PR positive	312 (37.82)
ER negative/PR negative	399 (48.36)
ER positive/PR negative	71 (8.6)
ER negative/PR positive	43 (5.21)

ER=Estrogen receptor, PR=Progesterone receptor

This study from Madurai is one of the first significant reporting of the ER, PR and Her-2 status of breast cancer patients from the south and perhaps the only major institutional reporting from south India. It is also one of the earliest of its kind to report the ER and PR status based on the 2010 ASCO/CAP interpretation guidelines. The study included a modest number of patients (n = 427), compared to the data from Tata Memorial Hospital, Mumbai, by Dinshaw (n = 1022).[6]

In this study, ER and PR positive was seen in 148 (37.46%) patients, ER and PR negative in 179 (45.31%) patients, ER positive and PR negative in 41 (10.37 %) patients, and ER negative and PR positive results was found in 27 (6.83%) patients. Her-2 was positive in 95 patients (24.05%). Triple Negative status was seen in 158 patients (40%). These values, as a percentage, are the highest ever reported from of India. These findings also reiterate the fact that the majority of the Indian breast cancer patients are still ER and PR negative in spite of the changes in the interpretation guidelines from the cut off of 10% to 1% nuclear staining. As far as the zonal comparison is concerned, this data from the south look similar to that from the other parts of south,[4] though not grossly different from the rest of the country.[3,5,6]

## CONCLUSIONS

This multi-institutional reporting of ER, PR and Her-2 status of 427 breast cancer patients from Madurai, based on the 2010 ASCO/CAP interpretation guidelines, suggest that the south is not grossly different from the rest of the country, with around half of the patients being negative for both ER & PR and nearly 40% of the patients having Triple negative breast cancer which carries a poor prognosis.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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