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ASSESSMENT OF PROGESTERONE RECEPTOR EXPRESSION IN CARCINOMA BREAST CASES PRESENTING TO A TERTIARY CARE HOSPITAL IN ANDHRA PRADESH

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ABSTRACT: Breast carcinoma is the most common malignant tumor and the leading cause of death, in women, worldwide.¹ it accounts for 15 % of all cancer deaths.² various protocols are in use for the assessment of prognosis, and also to assist in planning further management of these cases. Of various parameters, expression of Progesterone receptors (PR) is significant.³ the literature includes several studies showing association between the presence of progesterone receptors apart from other indicators of good prognosis like small tumor size, low histological grade, low nuclear grade and low mitotic activity.³ It is also a powerful predictive factor for the likelihood of benefit from adjuvant hormonal therapy. All cases of Carcinoma breast presenting to S.V.R.R.G.G. Hospital, are evaluated for Progesterone Receptor status using immunochemistry, indirectly assessing the prognosis of individuals presenting to the Hospital and in turn the prognosis of the disease in the region. **AIMS AND OBJECTIVES:** 1. To study the occurrence of Progesterone receptor status in breast cancer patients attending tertiary care Hospital (S.V.R.R.G.G. Hospital, Tirupati). 2. To correlate the expression of prognostic factors like age at presentation, parity, tumor size, number of lymph nodes, metastasis, grading with Progesterone receptor status.

KEYWORDS: Breast carcinoma, Progesterone receptors, Predictive factor, Prognosis.

INTRODUCTION: Breast carcinoma is the most common malignant tumor and the leading cause of death, in women, worldwide¹. It accounts for 15 % of all cancer deaths². Various protocols are in use for the assessment of prognosis, and also to assist in planning further management of these cases. Of various parameters, expression of Progesterone receptors (PR) is significant.

The progesterone receptor 4 is a protein found inside cells. It is activated by the steroid hormone progesterone. When no binding hormone is present the carboxyl terminal inhibits transcription. Binding to a hormone induces a structural change that removes the inhibitory action. Progesterone antagonists prevent the structural reconfiguration. After progesterone binds to the receptor, restructuring with dimerization follows and the complex enters the nucleus and binds to DNA. There transcription takes place, resulting in formation of messenger RNA that is translated by ribosomes to produce specific proteins. Progesterone receptor antagonists mifepristone work as antiprogesterin.⁴

In India progesterone receptor expression is found to be low. In a study conducted by Tanuja Shet et al.⁵ hormone receptor expression in India, was found to be low. Their study was undertaken to know percentage of female breast cancers expressing estrogen receptor and progesterone receptor in the locality in different age groups.

METHOD OF REPORTING BY IHC: Progesterone Receptor status is evaluated by immune-histochemistry technique with monoclonal antibodies (DAKO). PR positivity is assessed using Allred

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Score system. The Allred score combines the percentage of positive cells and the intensity of the reaction product in most of the specimen. The 2 scores are added together for a final score with 8 possible values.

Proportion Score	% of Positive Cells
0	0
1	<1
2	1-10
3	11-33
4	34-66
5	67-100
Intensity Score	Intensity of Positivity
0	None
1	Weak
2	Intermediate
3	Strong

The proportion score and intensity score are added together for a total score. Total score: PS+ IS Interpretation: Score of 0-2 as Negative and 3-8 as Positive.

MATERIALS AND METHODS: This prospective study of carcinoma breast was carried out in patients admitted to SVRRGG Hospital, Tirupati during the period from January 2013 to August 2014. Hundred cases of breast carcinoma were taken into study. The clinical study done by interviewing, detailed examination and subjecting to relevant investigations and surgeries, depending upon the stage of the disease. Excised specimen is sent for Histopathological examination in 10% formalin. Reports of light microscopy (Hematoxylin and Eosin) and immunohistochemistry on tumor histology including MBR (Modified Bloom Richardson) grading and Estrogen receptor status was analysed.

RESULTS:

PR STATUS	FREQUENCY	PERCENTAGE
Negative	65	65
Positive	37	37
Total	100	100

Table 1: Distribution of PR Status

Progesterone receptor positivity was seen in 35% of cases where as receptor negativity was seen in 65% of cases.

AGE RANGE	NUMBER OF INDIVIDUALS	PR STATUS +VE	PR STATUS -VE
21-30	3	0	3
31-40	22	10	12
41-50	32	5	27
51-60	18	5	13
61-70	22	15	7
71-80	3	0	3

Table 2: Distribution of Progesterone Receptors in Different Age Groups

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Majority of PR positivity was seen in elderly age group i.e, between 61–70 yrs. Patients between 31-40 form, the second most common PR positive age group. Majority of PR negativity is seen between 41-50yrs. The statistic analysis is done using fischer exact test according to which the p value is 0.3068 which is not significant.

PARITY	FREQUENCY	PR +ve	PR -ve
0	5(5%)	0	5
1-3	75(75%)	30	45
4+	20(20%)	5	15
Total	100(100%)	35	65

Table 3: Distribution of Progesterone Receptors Based on Parity Status

All the nulliparous patients were Progesterone receptor Negative.

Nulliparous women had PR negative tumors. Even in multiparous women, PR negativity predominates.

TUMOR	PR +VE	PR -VE	TOTAL
T1	3	0	3
T2	17	15	32
T3	12	20	32
T4	3	24	27
PAGETS	0	3	3
TX	0	3	3
Total	35	65	100

Table 4: Distribution of PR Status Based on Tumor Stage

About 90% of T4 tumors were PR negative. 61% T3 tumors were PR negative. 46% of T2 tumors were PR negative. p value is 0.13 hence not significant.

NODAL STATUS	PR +VE	PR -VE	TOTAL
N0	20	30	50
N1	10	32	42
N2	2	4	6
N3	2	0	2
Total	35	65	100

Table 5: Distribution of PR Status Based on Nodal Status

Among node negative patients 60% had PR negative tumors. Among N1 patients 76% had PR negative tumors. 66% of N2 cases had PR-ve tumors. All patients who had N3 were PR positive. p value is 0.2 hence insignificant.

METASTASIS	PR +VE	PR -VE	TOTAL
M0	35	62	97
M1	0	3	3
Total	35	65	100

Table 6: Distribution of PR Status Based on Metastatic Status

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62% of patients without metastasis had PR-ve status. 35% patients without metastasis had ER positive status. PR status was Negative in all the patients having metastasis. P value is 0.56 hence insignificant.

Mbr grading	Pr +ve	Pr -ve	Total
i	25	12	37
ii	9	41	50
iii	1	12	13
Total	35	65	100

Table 7: Distribution of Pr Status According to Modified Bloom Richardson Grading

Majority (92%) of grade III tumors were PR negative. Majority of Grade I tumors were PR positive. Probability is 0.0035 which is significant.

DISCUSSION: In the present study there were a total of 100 patients ranging from 30 to 72 yrs. The statistical analysis was made using Fischer exact test. Significant findings noted in the present study were:

1. PR receptor positivity is low in the population studied. Only 35% had receptor positivity.
2. Majority of PR positivity was seen in women >50yrs. Majority of PR negativity seen in women <50 yrs.
3. Only 5% cases were nulliparous. Both receptor positive and negative tumors are seen in multiparous women though receptor negative tumors predominate.
4. Majority (65%) presented with T2 and T3 tumors. There is no significant correlation between tumor size and receptor status.(p value=0.13)
5. 50% patients had no lymph node metastasis. There is no significant correlation with receptor status(p value= 0.2)
6. 97.5% patients had no distant metastasis. There is no significant correlation with receptor status(p value =0.56)
7. Majority presented at stage IIIB. Majority had PR negative tumors.
8. Majority of patients presented with Grade II tumors (50%) followed by

Grade I (37.5%) There is significant correlation with receptor status (p value=0.0035).

In accordance with the study of Thanuja shet et al⁵ progesterone receptor positivity status was low in the studied population. Though no significant relation was noted for majority factors studied, Grade of the tumor had some significant relation to the progesterone receptor status. Hence, the prognosis of Breast carcinoma in this region is likely to be poor, necessitating early diagnosis and intervention, in order to improve the survival rates.

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