

# Evaluation of pathological response to Neoadjuvant Chemotherapy in Locally Advanced Breast Carcinoma

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**Abstract-** Locally advanced breast cancer (LABC) is not a common occurrence and presents a significant challenge to medical professionals. Despite employing combined-modality therapy and new drugs, the chances of achieving long-term disease-free survival only range from 50% -70%. This suggests that there is still a need to determine the most effective therapeutic approach for these patients. A multimodality program that incorporates neoadjuvant systemic therapy is the current standard of care for LABC. The effectiveness of neoadjuvant chemotherapy is directly related to the patient's pathological response, which impacts disease-free survival. Hence, the purpose of this study was to investigate this correlation.

**Index Terms-** locally advanced breast cancer, neoadjuvant therapy, oncology.

## I. INTRODUCTION

Locally advanced breast cancer is a varied and diverse category of breast carcinoma, constituting roughly 10-20% of diagnosed cases in developed nations. However, in India, this group accounts for approximately 60% of breast cancer cases [1,2] In the past, radical mastectomy was the primary method of treating LABC until the middle of the last century. Stout et al identified skin ulceration, edema, and tumor fixation as markers of poor outcome, but this did not lead to a change in treatment approach [3,4]. However, the Oxford review highlighted the effectiveness of systemic therapy in addressing micrometastasis, which has greatly reduced the risk of recurrence and mortality. Neoadjuvant therapy is a modern treatment approach that has developed over the past thirty years and is now widely used globally. The treatment is aimed at reducing the size of locally advanced breast cancers that would otherwise be deemed inoperable, with the goal of making them operable prior to surgery. Neoadjuvant chemotherapy has become the norm for treating locally advanced breast cancer, with differing rates of pathological response [5]. A strong correlation has been noted between the extent of pathological response and the long-term outcomes of disease-free survival (DFS) and overall survival (OS) [6]. The purpose of this study is to evaluate the pathological response to neoadjuvant therapy in cases of breast cancer that had progressed to a locally advanced stage.

## II. OBJECTIVE

The goal of this study is to evaluate the effectiveness of neoadjuvant chemotherapy for patients with locally advanced breast cancer.

## III. MATERIAL AND METHODS

### Study

This prospective observational study was conducted from January 2022 to February 2023.

### Inclusion Criteria

- Age > 18 years
- Locally advanced carcinoma
- Willing for follow up

### Exclusion Criteria

- Prior Breast Surgery
- Prior radiotherapy to the breast
- Metastatic disease

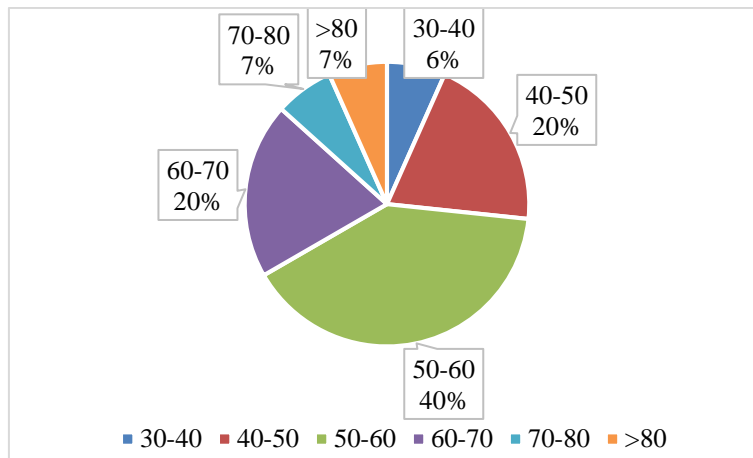
### Methodology

- Patients aged >18 years presenting with malignant breast lumps were evaluated.
- Diagnosis confirmed by core needle biopsy and grade and hormonal status assessed and metastatic workup done.
- Patients were followed up and the response of the tumour was assessed clinically and a modified radical mastectomy was done.

- Specimen was analysed for pathological response and observations made.
- Sample Size:15

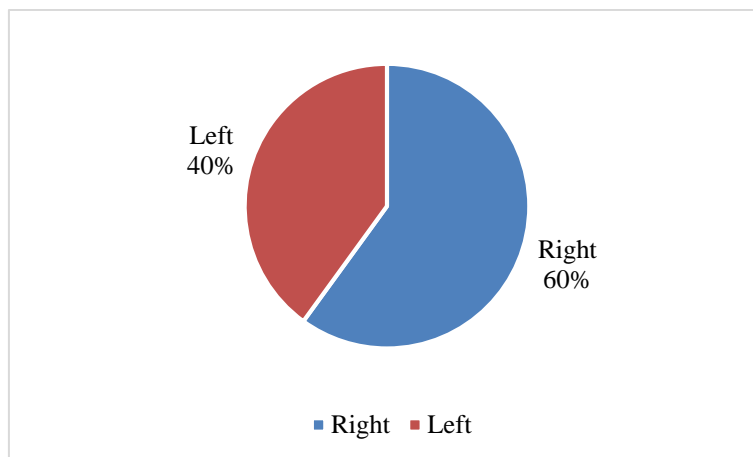
**IV. RESULTS**

Majority of patients were of 50-60 years. The age distribution graph is shown in Fig.1.



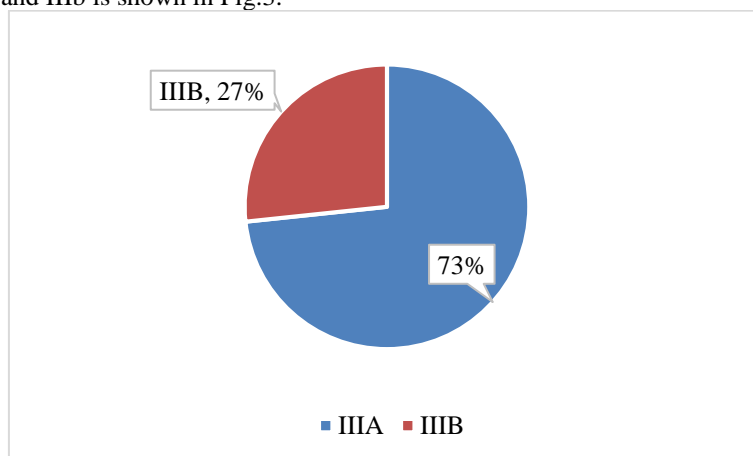
**Fig. 1: Age distribution**

The laterality of breast involvement is shown in Fig.2.



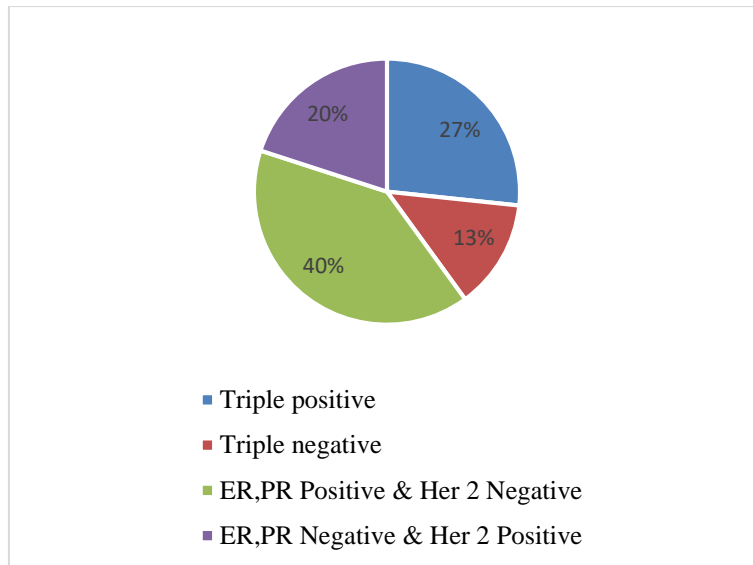
**Fig. 2: The side of the breast involved**

The percentage of Stage IIIa and IIIb is shown in Fig.3.



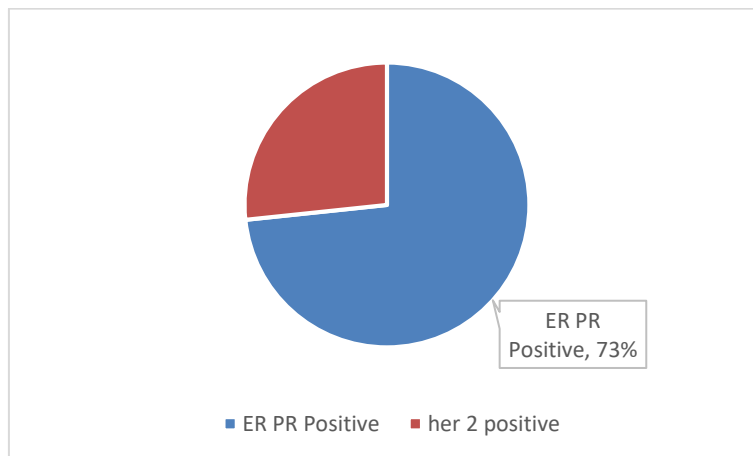
**Fig. 3: The Stage of the disease**

The Hormonal Status of patients shown in Fig. 4.



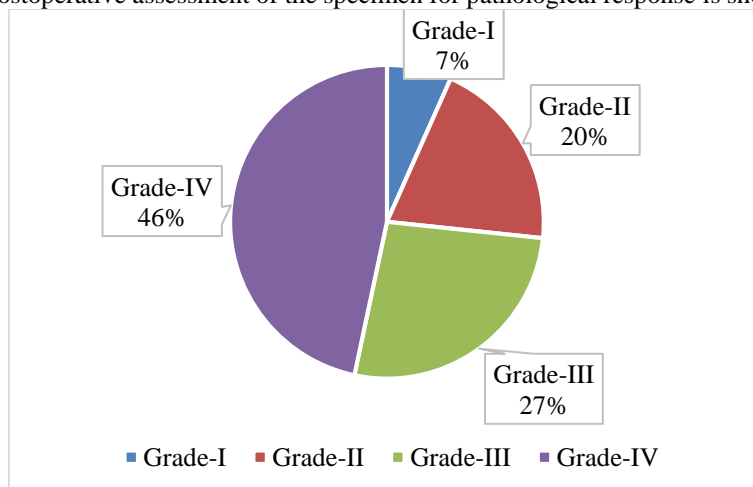
**Fig. 4: The Hormonal status of the Carcinoma**

The Prevalence of hormonal receptor status is shown in Fig. 5.



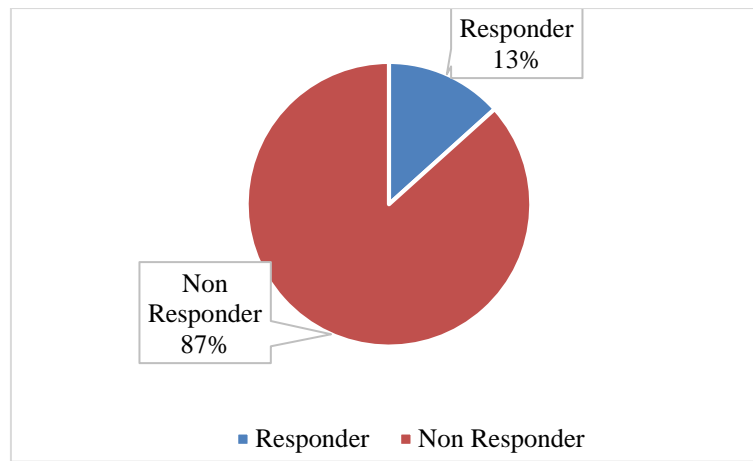
**Fig. 5: The Hormonal receptor Status**

Chevalier classification for Postoperative assessment of the specimen for pathological response is shown in Fig.6.



**Fig. 6: The Chevalier Classification**

The pathological response of neoadjuvant therapy is shown in Fig. 7.



**Fig. 7: The Pathological Response**

## V. DISCUSSION

In India, most patients are diagnosed with locally advanced or metastatic stages of breast cancer. Studies reveal that 45.7% of breast cancer cases in India report in advanced stages, while the majority of cases in the West report in stages I and II. This study aimed to evaluate the response of locally advanced breast cancer to neoadjuvant chemotherapy. The study population was mostly between the ages of 50-60, and the disease tends to peak at 40-50 years in Indian women [7]. The majority of patients had right-sided breast cancer, though studies did not find a statistically significant difference in incidence between left and right-sided lesions. Most patients (73%) belonged to stage IIIA, with the remaining 27% being in stage IIIB. Hormonal status revealed that 40% of patients were ER and PR positive with HER2 negative, 27% were triple positive, 13% were triple negative & 20% ER/PR negative but HER2 positive, while ER and PR-positive tumors were 73% each, and HER2 was 27%. The presence of ER and PR in invasive carcinoma has a positive correlation with survival and is an essential prognostic factor. Testing for ER, PR, and HER-2 in breast cancer has become the standard protocol. After post-MRM specimen assessment and classification of pathological response using Chevalier classification, 7% were Grade-I, 20% were Grade-II, 27% were Grade-III, and 46% were Grade-IV. Of the overall study population, only 17% showed complete pathological responses while 83% were non-responders, similar to a Cochrane study [8]. Early research by Lippman et al found that patients with low or absent ER values had higher response rates to chemotherapy in the metastatic breast cancer setting, and Bonadonna et al reported higher response rates in patients with ER-negative tumors in the neoadjuvant setting, which could explain the lower response rate to neoadjuvant chemotherapy observed in our study due to the higher prevalence of ER positivity [9,10].

## VI. CONCLUSION

Locally advanced breast cancer (LABC) is a rare yet challenging clinical condition. Despite the use of combination therapies and novel medications, the long-term survival rate of patients is only about 50%-70%. This suggests that optimal therapy for LABC has not been defined yet. The current approach to treating LABC involves neo-adjuvant systemic therapy integrated into a multimodality program. The ideal chemotherapy regimen and duration of treatment are still being debated and no consensus has been reached. One of the key considerations in neo-adjuvant chemotherapy is the response to initial treatment, which can help tailor subsequent treatment based on the response. However, a strong correlation between clinical and pathologic responses has not been established. Patients who achieve a pathological complete response (pCR) in the primary tumor and those without axillary lymph node metastases after neoadjuvant chemotherapy tend to have better disease-free survival rates. Identifying which tumors are likely to respond to specific treatments could significantly improve the prognosis for LABC patients. Advances in cancer biology and genomic profiling offer the opportunity to modify the clinical management of LABC and introduce highly effective individualized treatment approaches.

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