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"CLINICOPATHOLOGICAL STUDY OF NEOADJUVANT CHEMOTHERAPY IN BREAST CANCER"

General Surgery

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ABSTRACT

Aim And Objectives: To study the response to neoadjuvant chemotherapy, clinically and pathologically in breast carcinomas **Materials And Methods:** The study is a prospective study done at ASRAM Hospital over 18 months (DEC 2023 - MAY 2025) on patients who received neoadjuvant chemotherapy in breast cancer with a sample size of 30 patients. **Results:** 8 (26.7%) patients had complete clinical response, 11 (36.7%) patients had partial clinical response, 7 (23.3%) patients had no response and 4 (13.3%) patients had progressive disease. 4(13.3%) patients had complete pathological response. Response to neoadjuvant chemotherapy found to be better in ER positive PR positive and HER 2 positive patients. Response to neoadjuvant chemotherapy is better in 51-60 yrs age group and in post-menopausal patients. **Conclusion:** Many patients experienced a significant reduction of the locoregional disease after Adriamycin, Cyclophosphamide and in turn had less morbid surgical treatment. So preoperative chemotherapy downstage the primary tumour and axillary metastasis in patient with locally advanced breast carcinoma making inoperable locally advanced breast carcinoma operable.

KEYWORDS

neoadjuvant chemotherapy, locally advanced breast carcinoma

INTRODUCTION

Locally advanced breast carcinoma (LABC) remains a major clinical challenge across the globe. It is characterized by a large primary tumor involving the chest wall, with or without axillary lymph node involvement, often accompanied by matted axillary and/or internal mammary nodes[1]. Metastatic disease confined to the supraclavicular nodes has shown improved outcomes with multi-modality treatment approaches[2], leading to its inclusion in the stage III LABC classification[3].

Despite undergoing radical surgery, patients face reduced long-term survival due to frequent loco-regional recurrences[4]. In this setting, neoadjuvant systemic therapy—also referred to as primary or induction therapy—has gained traction as a key treatment modality. Yet, response rates to neoadjuvant chemotherapy (NACT) remain limited, with only about 30% of patients experiencing partial or complete remission. The early administration of chemotherapy targets micro-metastatic disease, enhancing therapeutic control[5].

An observed response at the primary site serves as a surrogate marker of the regimen's systemic efficacy. NACT can also convert inoperable tumors into operable ones, thereby increasing the feasibility of breast-conserving surgeries and improving overall survival in women with LABC[6].

Prognostic outcomes are notably better in patients diagnosed at an earlier stage, particularly those without axillary lymph node involvement[7]. Conversely, survival declines with increasing lymph node burden and tumor size[7,8]. According to Valagussa et al.[8], five-year survival rates correlate inversely with tumor dimensions—65% for tumors under 5 cm, 36% for those between 5–10 cm, and just 16% for tumors exceeding 10 cm.

Use of neoadjuvant chemotherapy does result in loss of standard and well validated pathological prognostic markers such as initial tumor size and the number of axillary lymph node involved. Most importantly the survival rates of women treated with adjuvant / Neoadjuvant chemotherapy are equivalent, making either approach reasonable for a woman with operable breast cancer[9,10].

Aim Of The Study:

- To study the clinical and pathological response to neoadjuvant chemotherapy in carcinoma breast.

Objectives Of The Study:

- To assess the clinical response rate
- To evaluate the pathological response
- To determine the influence of age group
- To compare treatment outcomes between pre-menopausal and post-menopausal patients.

MATERIALS AND METHODS

- **Study Method:** Prospective Study
- **Study Area:** ASRAM hospital
- **Study Period:** DEC 2023 – MAY 2025(18 MONTHS)
- **Study Population:** Patients presenting to ASRAM medical college hospital with breast cancer
- **Sample Size:** 30 patients

Inclusion Criteria:

- All the patients who received neoadjuvant chemotherapy for carcinoma breast and underwent modified radical mastectomy post neo adjuvant chemotherapy.

Exclusion Criteria:

- Early breast carcinoma.
- Metastatic carcinoma breast
- Who missed follow up & not willing for study.

OBSERVATIONS AND RESULTS

Table 1: Clinical Response (Recist Criteria)

Clinical Response	Frequency	Percent
Complete Response	8	26.7
Partial Response	11	36.7
No Response	7	23.3
Progressive Disease	4	13.3
Total	30	100.0

Table 2: Pre Chemotherapy Tumor Stage Compared With Post Chemotherapy Tumor Stage:

		Post Chemotherapy Tumor Stage					Total
		T0	T1	T2	T3	T4	
Pre Chemotherapy Tumor Stage	T2	0 0.0%	0 0.0%	1 3.3%	0 0.0%	0 0.0%	1 3.3%
	T3	4 13.3%	0 0.0%	3 10.0%	3 10.0%	2 6.7%	12 40.0%
	T4	4 13.3%	3 10.0%	3 10.0%	3 10.0%	4 13.3%	17 56.7%
Total		8 26.7%	3 10.0%	7 23.3%	6 20.0%	6 20.0%	30 100.0%

Table 3: Pre Chemotherapy Nodal Stage Compared With Post Chemotherapy Nodal Stage:

		Post Chemotherapy Nodal Stage			Total
		N0	N1	N2	
Pre	N0	4	0	0	4

Chemotherapy		13.3%	0.0%	0.0%	13.3%
Nodal Stage	N1	13 43.3%	7 23.3%	0 0.0%	20 66.7%
	N2	3 10.0%	1 3.3%	2 6.7%	6 20.0%
Total		20 66.7%	8 26.7%	2 6.7%	30 100.0%

Table 4: Assessment Of Clinical Response In Age Groups:

		CLINICAL RESPONSE				Total
		Complete Response	No Response	Partial Response	Progressive disease	
AGE RANGE	</=40yrs	0 0.0%	2 6.7%	1 3.3%	0 0.0%	3 10.0%
	41-50yrs	2 6.7%	1 3.3%	2 6.7%	2 6.7%	7 23.3%
	51-60yrs	5 16.7%	3 10.0%	5 16.7%	2 6.7%	15 50.0%
	>60yrs	1 3.3%	1 3.3%	3 10.0%	0 0.0%	5 16.7%
Total		8 26.7%	7 23.3%	11 36.7%	4 13.3%	30 100.0%

Table 5: Clinical Response With Menstrual Status:

		CLINICAL RESPONSE				Total
		Complete Response	No Response	Partial Response	Progressive disease	
Menstrual Status	Post menopausal	5 17.2%	5 17.2%	9 31.0%	2 6.9%	21 72.4%
	Pre menopausal	2 6.9%	2 6.9%	2 6.9%	2 6.9%	8 27.6%
Total		7 24.1%	7 24.1%	11 37.9%	4 13.8%	29 100.0%

DISCUSSION

We conducted this study of clinical and pathological response to neoadjuvant chemotherapy in carcinoma breast between DEC 2023 – MAY 2025.

30 patients received 4 cycles of neoadjuvant chemotherapy (Adriamycin, Cyclophosphamide) and underwent modified radical mastectomy post neoadjuvant chemotherapy

In our study,

- 50% of patients were between 51-60 years.
- 96.7% of patients were female and 3.3% were male.
- 70% of patients were postmenopausal.
- 93.3% of patients had infiltrating ductal carcinoma and 6.7% of patients had infiltrating lobular carcinoma.
- Majority (60%) of patients were grade 2

According to RECIST criteria, Complete clinical response is seen in 26.7% of patients, Partial Response in 36.7%, No response in 23.3%, Progressive Disease in 13.3%.

Alvarado et al[11] examined 205 patients and found that 40% showed a reduction in tumor size following neoadjuvant chemotherapy. Among them, 12% achieved complete clinical response and 28% had a partial response. However, only 8% showed complete pathological response, with no detectable invasive breast cancer or axillary lymph node metastases after four treatment cycles. These outcomes closely align with those from our study, where tumor shrinkage was observed in 63.3% of patients. Of those, 26.7% had a complete clinical response and 36.7% had a partial response, while 13.3% demonstrated complete pathological response.

In a related study, Gharbi et al[12] reported an overall clinical response rate of 63%, with 49% showing partial response and 14% achieving complete clinical response. However, the rate of complete pathological response was just 7%.

No patients are T0 stage and 56.7% of patients are T4 stage in prechemotherapy phase, and in post chemotherapy phase 26.7% of patients are T0 stage and 20% are T4 stage.

66.7% of patients are N1 stage in pre chemotherapy phase and 66.7% of patients are N0 stage in post chemotherapy phase.

In our study Response is better in 51-60 yr group and better in post-menopausal patients.

CONCLUSION

A substantial proportion of patients showed marked regression in locoregional disease following administration of Adriamycin and Cyclophosphamide, which subsequently enabled less invasive surgical interventions. Preoperative chemotherapy effectively downstaged both the primary tumor and axillary lymph node involvement in individuals with locally advanced breast carcinoma, rendering previously inoperable cases amenable to surgery. Tumor size reduction in regional disease emerged as a strong indicator of chemotherapy responsiveness. In our cohort, all patients were treated with Adriamycin and Cyclophosphamide, with 63.4% exhibiting clinical improvement. Looking ahead, the identification of reliable biological markers that forecast clinical and pathological outcomes to systemic therapy holds significant promise. Personalized neoadjuvant treatment approaches based on predictive biomarkers may define the future of breast cancer management.

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