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Clinicopathological response and breast conservation in locally advanced breast cancer cases treated with neoadjuvant chemotherapy

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Abstract. Neoadjuvant chemotherapy is crucial for enhancing surgical outcomes and enabling breast conservation in locally advanced breast adenocarcinoma, which is often inoperable. This prospective cohort study aimed to evaluate the clinic-pathological response and breast conservation rates in patients with locally advanced breast cancer undergoing neoadjuvant chemotherapy. The patients were administered chemotherapy according to a standard protocol and were followed until their surgical outcome. Out of a total of 90 patients with locally advanced breast cancer, 78 were eligible for neoadjuvant therapy. These patients, with a mean (SD) age of 47.5 (9.4) years, were included in the study. Nearly half (52.6%) were post-menopausal; 55% (n = 43) had right breast involvement, and 57.7% (n = 45) had invasive lobular carcinoma. Approximately 47.43% of patients demonstrated a complete clinical response. In comparison, only 37% achieved a pathological complete response, which was not associated with the oestrogen receptor, progesterone receptor, or human epidermal growth factor receptor-2 status ($p > 0.05$). Patients who achieved a complete clinical response had a higher likelihood of undergoing breast conserving surgery ($p < 0.05$). The study observed that breast conservation rates were improved with neoadjuvant chemotherapy. These findings may assist clinicians in improving treatment outcomes for patients with locally advanced breast cancer

Keywords: advanced cancer; invasive breast carcinoma; oncological outcomes; breast-conserving surgery

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Introduction

The advanced stage and unpredictable presentation of locally advanced breast cancer (LABC) make it a formidable challenge for treatment and prone to surgical difficulties, requiring a multidisciplinary approach for optimal management [1]. The diagnosis of LABC is characterised by a primary breast tumour (TM) that is larger than 5 cm or classified as T3, along with fixed (matted) axillary lymph nodes, skin or chest wall involvement (T4), or spread of the disease to ipsilateral internal mammary nodes or supraclavicular nodes, without distant metastases [2].

Among Indian women, breast cancer is the most frequent malignancy, with an age-adjusted incidence rate of 25.8 per 1,000,000 [3]. LABC represents a subset of breast cancer patients who present with unique clinical characteristics and treatment considerations. LABC accounts for 5% of breast cancer cases in developed countries [4], while its prevalence is notably higher in resource-limited countries such as India [1]. LABC constitutes nearly 40% of breast cancer cases, with a survival rate of 13-24% following surgical intervention, and a recurrence rate of approximately 27% [3, 5].

L. Cuniolo *et al.* [1] and M.E. Akbari *et al.* [6] revealed that LABC is a complex tumour that requires a multi-pronged approach. They highlighted that optimal management necessitates well-coordinated care by medical, surgical, and radiation oncologists, involving radiation therapy, surgery, and chemotherapy.

Neoadjuvant chemotherapy (NACT) has been instrumental in managing LABC, as noted in studies by L.A. Korde *et al.* [7] and M. Dhanushkodi *et al.* [3]. NACT has recently been employed to reduce pre-operative tumours. A study by V. Pandurangappa *et al.* [8] demonstrated that NACT may increase the likelihood of achieving a pathologic complete response (pCR) in 91% of patients and reduce the mean tumour size; however, it may not lead to a significant increase in overall survival. Additionally, a partial or complete response to NACT results not only in a better prognosis but also in improved disease-free survival (DFS), distant disease-free survival (DDFS), and overall survival (OS), as evidenced by a case report by L. Cuniolo *et al.* [1]. Thus, patients who achieve a pCR after NACT exhibit a significantly better prognosis compared to those who do not.

Despite these advancements, several questions remain regarding the prognostic significance of NACT response and its implications for clinical practice. Furthermore, the impact of different chemotherapy regimens on treatment outcomes remains an area of ongoing investigation. In addressing these questions, this study was undertaken to gain insights into optimising treatment strategies and improving outcomes for patients with LABC. Therefore, this study aimed to assess the clinicopathological response of NACT in LABC patients and to evaluate the effect of different chemotherapy regimens on patient outcomes.

Materials and Methods

This was a prospective cohort study conducted among female breast cancer patients registered at the institute between 2021 and 2023. A total of 90 female patients diagnosed with LABC, according to the criteria established by the American Joint Committee on Cancer (8th edition) [9], were included in the study. Of these, only 78 were eligible for neoadjuvant therapy. The follow-up of the patients was conducted during their regular hospital visits for chemotherapy on a monthly basis. Data were recorded up to the final outcome (i.e. surgery) as per the study objective.

Patients diagnosed with LABC, as defined below, were included in the study. Exclusion criteria were patients who did not give consent and those with metastases. All patients diagnosed with LABC were informed about neoadjuvant chemotherapy and were given the regimen as decided by the oncologist. All patients received external beam radiation therapy (EBRT) as adjuvant therapy, followed by hormonal therapy depending on their hormonal status.

Diagnosis. The patients were diagnosed based on relevant clinical history, mammography, and a pathologically confirmed biopsy. Chest X-rays, abdominal ultrasonography, bone scans, and PET-CT scans were performed to identify distant metastases. Immunohistochemistry (IHC) was used to determine the hormonal and HER2/neu receptor status.

Pre-operative therapy. Neoadjuvant chemotherapy is employed to achieve local control and enable surgery with clear resection margins. The response to neoadjuvant chemotherapy includes tumour downstaging by reducing the size of the tumour and the extent of local disease [9-11], improving surgical outcomes by increasing the chances of achieving clear surgical margins, identifying non-response to initial chemotherapy, reducing the likelihood of axillary lymph node involvement, thereby facilitating surgery, and achieving a pathological complete response [12, 13]. Response to neoadjuvant chemotherapy was monitored through clinical assessments such as changes in tumour size and symptoms [14], mammography for baseline assessments, ultrasound for real-time tumour size monitoring, magnetic resonance imaging (MRI) for detailed imaging of tumour response, and positron emission tomography (PET) imaging studies for evaluating metabolic response. Pathological evaluations were conducted with needle biopsies to assess histological response. In addition, biomarker analysis and patient-reported outcomes were undertaken [14, 15].

The 78 patients involved in the study were given different chemotherapy regimens such as AC followed by Taxol, Taxol followed by AC, Cyclophosphamide, Methotrexate, and 5-Fluorouracil (CMF regimen), and Fluorouracil, doxorubicin, and cyclophosphamide (FAC regimen) based on clinical discretion. The four most common regimens used are listed in Table 1.

Table 1. Chemotherapy regimens for LABC

Sr. No.	Chemotherapy regimen
1	Doxorubicin (Adriamycin 40 mg/m^2) and Cyclophosphamide (200 mg/m^2/day) also called AC. The patients received chemotherapy every four weeks for four cycles. After this, surgery was performed, followed by four cycles of Taxol.
2	In this regimen, four cycles of Doxorubicin (Adriamycin) and Cyclophosphamide were followed by four cycles of Taxol (175 mg/m^2). After these eight cycles, surgery was performed.
3	Cyclophosphamide 600 mg/m^2 IV infusion, Methotrexate 40 mg/m^2 IV bolus, and 5-fluorouracil 600 mg/m^2 IV bolus. The regimen was administered every four weeks for six to eight cycles.
4	Fluorouracil 500 mg/m^2, Doxorubicin 40 mg/m^2, and Cyclophosphamide 500 mg/m^2. This regimen was administered every four weeks for six months.

Source: compiled by the authors

Radiotherapy. Radiotherapy involved standard fractionation over 25-28 days, delivering a cumulative dose of 45-50.4 Gy. The standard fractionated dose was given five days a week, from Monday to Friday, with sessions lasting 15 to 30 minutes, varying from patient to patient. The most common fractionation schedule was 1.8 to 2.0 Gray (Gy) per fraction, with a total cumulative dose ranging from 45 to 50.4 Gy. The cumulative dose was chosen to be high enough to target and kill cancer cells, but not high enough to damage surrounding healthy tissues. Smaller fractions of these doses would also allow effective treatment by taking advantage of the differential repair rates of cancer and normal cells [16, 17].

Monitoring and evaluation of the radiotherapy were conducted through clinical assessments, imaging studies including CT scans, MRI, PET scans, and the response evaluation criteria in solid tumours (RECIST) [16, 18] criteria to assess tumour size and classify response as complete, partial, stable disease, or progressive disease. Blood tests and biomarkers were also used to evaluate the tumour's response to treatment. Patient-reported outcomes and feedback were also considered [19].

Local therapy (surgery). Following NACT, the tumour was surgically removed, thereby eliminating any locoregional spread. Depending on the patient's condition, various surgical techniques were employed, including modified radical mastectomy (MRM), total mastectomy, and breast-conserving surgery (BCS).

Adjuvant systemic therapy. Patients received post-operative systemic therapy tailored to their individual needs following surgery. Adjuvant endocrine therapy was administered to patients with expressed oestrogen and/or progesterone receptors. Patients requiring specialised therapy had harmful germline abnormalities in either BRCA1 or BRCA2. Overall, the strategy included a combination of adjuvant systemic therapy, radiotherapy, chemotherapy, surgery, and diagnostic imaging, all customised to the specific requirements and tumour characteristics of each patient.

Statistical analysis. The collected data were entered into MS Excel using passwordprotected files and analysed using SPSS software. Quantitative variables were described as the mean and SD after checking the normality of the data. Qualitative variables were described as frequency and percentage. The chi-square test was used as a test of significance, and for quantitative data, an unpaired t-test was used. A p-value of <0.05 was considered statistically significant.

Complete clinical response. The neoadjuvant chemotherapy clinical response was assessed using MRI and ultrasound scans, along with the RECIST version 1.1 [20].

MRI and ultrasound procedures in radiotherapy. MRI procedure. MRI scans were conducted to evaluate the response and detect the presence of any residual disease. These scans were performed using high-field MRI scanners, with magnetic field strengths ranging from 1.5 Tesla to 3 Tesla. Patients were instructed to fast or undergo bowel preparation. The scan duration ranged from 15 to 60 minutes, depending on the complexity and the number of sequences required. An intravenous gadolinium-based contrast agent was used to highlight differences between normal and abnormal tissues.

Ultrasound procedure. Ultrasound was less frequently utilised than MRI. Ultrasound imaging was carried out using a handheld transducer connected to an ultrasound machine. The frequency of the transducer varied, typically between 2 and 15 MHz, depending on the required depth and resolution. A gel was applied to the skin over the areas to be examined to facilitate the transmission of sound waves. The transducer was then moved over the skin to capture real-time images of the tissues. This procedure took 15 to 30 minutes. In some cases, contrast-enhanced ultrasound (CEUS) was employed, where microbubble contrast agents were injected to improve image quality and assess blood flow.

Pathological complete response. The absence of the primary tumour and any lymph node metastases in the surgical specimen was defined as a pathological complete response [21-23].

Histopathological analysis procedure. Samples were collected through biopsies and surgical resections, all performed under sterile conditions. Fixation was undertaken to preserve the tissue morphology, using 10% neutral buffered formalin, followed by standard fixation procedures. Staining was carried out using haematoxylin and eosin (H&E) stains, and antigen determination followed standard procedures. The analysis was conducted under a light microscope to observe cellular morphology and tissue structures.

Written informed consent was obtained from the patients before including them in the study. The study adhered strictly to the principles outlined in the Declaration of Helsinki [24], ensuring that all participants provided informed consent voluntarily and comprehensively. Confidentiality and privacy were meticulously safeguarded throughout the study, with data anonymised to prevent identification.

Results

Of the total 90 LABC patients in the study, only 78 were eligible for neoadjuvant therapy. The mean (SD) age of the patients was 47.5 (9.4) years. More than half (52.6%) were post-menopausal, while 44.8% (n = 35) were pre-menopausal. Additionally, 55% (n = 43) had right breast involvement, 57.7% (n = 45) had invasive lobular carcinoma, and 42.3% (n = 33) had invasive ductal carcinoma. In terms of staging, the most common stage was IIIB, observed in 39.7% (n = 31) of patients, followed by IIIA in 34.6% (n = 27) and IIIC in 17.9% (n = 14), with stage IV breast carcinoma being the least common, seen in only one patient (1.3%). There were 52.7% ER-positive cases (n = 30), while progesterone receptor-positive cases constituted 40.5% (n = 30), and 45.7% (n = 32) of cases were Her2neu-positive (Table 2).

Table 2. Clinical history of the patients (n = 78)

Variable	Frequency (%)
Menstrual Status	
Pre-menopausal	35 (44.8)
Peri-menopausal	02 (02.6)
Post-menopausal	41 (52.6)
Breast Involvement	
Right	43 (55.0)
Left	35 (45.0)
Morphology of Breast Carcinoma	
Invasive Ductal Carcinoma	33 (42.3)
Invasive Lobular Carcinoma	45 (57.7)
Clinical Stage	
IIa	02 (02.6)
IIb	03 (03.9)
IIIa	27 (34.6)
IIIb	31 (39.7)
IIIc	14 (17.9)
IV	01 (01.3)
ER (n = 74)*	
Positive	39 (52.70)
Negative	35 (44.87)
PR (n = 74)*	
Positive	30 (40.54)
Negative	44 (59.45)
Her2neu (n = 70)#	
Positive	32 (45.71)
Negative	38 (54.28)

Notes: * – only 74 patients were evaluated for ER-PR receptor status; # – only 70 patients Her2neu status evaluated
Source: compiled by the authors

Patients had been given various neoadjuvant chemotherapy regimens as per the four regimens described in Table 3 below. Forty-six patients were given the 4#AC-4#Tx-Sx regimen, twenty were given the 4#AC-Sx-4#Tx regimen, ten patients received the 6#FAC regimen, and two patients were treated with the 6-8#CMF – Sx regimen. A complete clinical response was observed in the 4#AC-4#Tx-Sx regimen (n = 23/46), followed by the 4#AC-Sx-4#Tx regimen (n = 11/20). A pathological complete response was also observed in similar proportions in these two regimens. There was no statistically significant difference in the clinical or pathological response concerning the different NACT regimens (Table 3).

Almost an equal proportion of pre-menopausal and post-menopausal patients exhibited a complete clinical response (n = 18/35 and n = 19/41, respectively). Less than half of the patients with invasive ductal carcinoma achieved a complete clinical response. Almost equal numbers of ER-positive and ER-negative carcinoma patients demonstrated a complete clinical response, while a greater proportion of PR-positive (17/30) patients compared to PR-negative (16/44) patients, and more Her2neu-positive (17/32) patients, achieved a complete clinical response. No statistical association was observed between the clinical characteristics of patients and their

clinical or pathological responses ($p > 0.05$) (Table 2). The clinical response was significantly associated with the type of surgery involved ($p < 0.05$); however, the different neoadjuvant chemotherapy regimens were not statistically significantly associated with complete clinical or pathological responses ($p > 0.05$). Table 4 shows the association of clinical characteristics with clinical and pathological responses.

Table 3. Clinical and pathological response to different NACT (n = 78)

Regimen	CR	NR	PD	PR	Total	p-value
Clinical response						
4#AC-Sx-4#Tx [1]	11	01	00	08	20	10.50 (0.31)
4#AC-4#Tx-Sx [2]	23	04	01	18	46	
6-8#CMF – Sx [3]	01	01	00	00	02	
6#FAC [4]	02	01	01	06	10	
Pathological response						
4#AC-Sx-4#Tx [1]	09	01	00	18	20	10.05 (0.35)
4#AC-4#Tx-Sx [2]	15	04	01	26	46	
6-8#CMF – Sx [3]	01	01	00	00	02	
6#FAC [4]	02	02	01	05	10	

Notes: CR – complete response; NR – no response; PD – progressive disease; PR – partial response; # – Chi-square test with Yate's correction; the dosages of chemotherapeutic agents are detailed in Table 1
Source: compiled by the authors

Table 4. Clinical characteristics and their association with clinical and pathological response (n = 78)

Variable	CR	NR	PD	PR	Total	p-value
Clinical response						
Menstrual status						
Pre-menopausal	18	6	1	12	35	5.45 (0.14)
Post-menopausal	19	1	1	20	41	
Morphology of breast carcinoma						
Invasive ductal carcinoma	38	7	2	38	85	0.79 (0.851)
Invasive lobular carcinoma	3	0	2	0	5	
ER status						
Positive	17	3	0	19	39	4.36 (0.628)
Negative	16	4	1	14	35	
PR status						
Positive	17	3	0	10	30	6.50 (0.369)
Negative	16	4	1	23	44	
Her2neu status						
Positive	17	3	1	11	32	5.53 (0.478)
Negative	15	4	0	19	38	
Pathological response						
Menstrual status						
Pre-menopausal	14	7	1	15	35	7.30 (0.062)
Post-menopausal	13	1	1	26	41	
Morphology of breast carcinoma						
Invasive ductal carcinoma	27	8	2	48	85	0.69 (0.874)
Invasive lobular carcinoma	2	0	0	3	5	
ER status						
Positive	9	3	0	27	39	6.30 (0.390)
Negative	14	4	1	16	35	
PR status						
Positive	8	3	0	19	30	2.87 (0.825)
Negative	15	4	1	24	44	
Her2neu status						
Positive	12	3	1	16	32	4.59 (0.596)
Negative	9	4	0	25	38	

Notes: CR – complete response; NR – no response; PD – progressive disease; PR – partial response; p-value <0.05 considered statistically significant
Source: compiled by the authors

Table 5 demonstrates the association of clinical characteristics with surgical intervention. It is important to note that clinical response had a significant impact on the choice of surgical intervention ($p < 0.05$), highlighting the importance of accurate assessment of the response to NACT for planning further treatment.

Table 5. Association of clinical characteristics with surgery (n = 78)

Drug therapy	Surgery				p-value
	BCS	MRM	Total mastectomy	Total	
Oestrogen receptor					
Positive	10	26	0	36	4.03 (0.402)
Negative	12	18	1	31	
Progesterone receptor					
Positive	8	21	0	29	3.46 (0.483)
Negative	14	23	1	38	
HER2 status					
Positive	10	19	1	30	2.96 (0.563)
Negative	12	21	0	33	
Drug therapy (n = 78)					
4#AC-Sx-4#Tx [1]	9	11	0	20	5.68 (0.460)
4#AC-4#Tx-Sx [2]	14	31	1	46	
6-8#CMF – Sx [3]	0	2	0	2	
6#FAC [4]	2	7	1	10	
Clinical response					
CR	15	22	0	37	80.47 (<0.0001)
NR	1	6	0	7	
PD	0	0	2	2	
PR	9	23	0	32	

Notes: CR – complete response; NR – no response; PD – progressive disease; PR – partial response; # – number of cycles; the dosages of chemotherapeutic agents are detailed in Table 1
Source: compiled by the authors

In a study of 90 LABC patients, 78 were eligible for neoadjuvant therapy with a mean age of 47.5 years. Clinical response rates were similar across the pre- and post-menopausal groups and varied slightly based on hormone receptor status. No significant association was found between clinical characteristics and response to treatment, but clinical response significantly influenced the choice of surgical intervention, emphasising the need for accurate assessment in treatment planning.

Discussion

Of the 90 LABC patients in this study, 78 were eligible for neoadjuvant therapy, with a mean age of 47.5 years. The majority were post-menopausal (52.6%), with right breast involvement (55%) and invasive lobular carcinoma (57.7%). Most patients were staged at IIIB (39.7%) or IIIA (34.6%). Complete clinical and pathological responses were highest in the 4#AC-4#Tx-Sx regimen and were similar across other regimens, with no significant differences observed based on therapy type. Clinical response significantly influenced surgical choice, but no strong associations were found between clinical characteristics and response outcomes.

The mean (SD) age of the patients was 47.5 (9.4) years in this study, which is comparable to the studies of P. Chidley *et al.* [25] and T. Bhattacharyya *et al.* [26]. In these studies, the majority of participants were in the post-menopausal state, which is consistent with the findings of this study. The mean age of patients in the study by C.E. DeSantis *et al.* [27] was around 50 years, with a significant proportion of post-menopausal women and right breast involvement. Invasive lobular carcinoma was less frequent compared to the findings of the Indian study. Similar to the Indian study, the one by A. van der Voort *et al.* [28] had an average age of 45 years, with a higher proportion of patients presenting with HER2-positivity.

The majority of the patients in this study received six cycles of chemotherapy, with Doxorubicin (Adriamycin) and Cyclophosphamide, also referred to as AC, used as the main regimen of treatment. Following this, AC with Taxol was administered as per institutional policy. No statistically significant difference was observed between the clinical and pathological responses to the different regimens. However, according to H.D. Bear *et al.* [12], the National Surgical Adjuvant Breast and Bowel Project (NSABP) trial, conducted by the National Cancer Institute, reported superior response rates with the sequential use of taxanes and doxorubicin, leading to superior partial and complete responses in both ER-positive and ER-negative patients.

In this study, nearly 47.43% of patients had a complete clinical response, while only 37% had a complete pathological response. This response is higher compared to the 26% complete clinical response and 13% complete pathological response in the study conducted by S.K.R. Kunnuru *et al.* [29]. A study by P. Choudhary *et al.* [30] showed

that the complete pathological response to NACT in LABC patients was 21%. Another study by A.A. Alawad [31] showed a complete clinical response of 11%. The possible reason for the differences in the response may be due to the different regimens administered to the patients in various studies. In the study by G. Curigliano *et al.* [32], NACT was shown to achieve a high rate of clinical and pathological complete responses (PCRs) in patients with HER2-positive and triple-negative breast cancers, resulting in significant downstaging and improved surgical outcomes. Meanwhile, in the study by Loibl *et al.* [33], it was highlighted that NACT led to increased rates of breast-conserving surgeries compared to pre-NACT scenarios, with better outcomes observed particularly in triple-negative and HER2-positive subtypes.

The clinical or pathological response was not dependent on other characteristics such as ER-positive status, PR-positive status, or Her2-neu status of the LABC. Conversely, the study by P. Choudhary *et al.* [30] demonstrated a positive correlation between Stage II and the absence of ER/PR expression, which showed a statistically significant correlation ($p < 0.05$) with the rate of pCR. The study conducted by O. Mermut *et al.* [34] also revealed that the T1 stage and N1 stage, along with negative oestrogen/progesterone receptor status, were significantly associated with NACT response. This limitation may be due to the use of different chemotherapy regimens.

Thirty-two per cent of the patients could undergo breast-conserving surgery (BCS) after NACT. The rates of BCS following NACT in this study are higher compared to those reported in the findings of Scientist S.K. Agrawal *et al.* [35]. These variations may be attributed to the variety of chemotherapeutic regimens and the differences in the study population. Similarly, the study by A. Soran *et al.* [36] showed increased rates of breast-conserving surgery after NACT, particularly in patients with a good clinical response. Mastectomies were still performed but were less frequent compared to pre-NACT rates. The study by M.R. Kwon *et al.* [37] found that NACT improved the feasibility of breast-conserving surgery, especially in patients who initially presented with indications for mastectomy.

Overall, patients with CR and pCR had a higher likelihood of undergoing breastconserving surgery compared to other responses. A meta-analysis by Y. Sun *et al.* [38] demonstrates similar findings. Therefore, it can be concluded that NACT resulting in complete clinical and pathological responses is associated with a greater likelihood of breast conservation. The study by L.M. Spring *et al.* [39] noted that patients with HER2-positive and triple-negative breast cancer types were more likely to achieve complete clinical responses, which correlated with a higher rate of breast-conserving surgery. Another study by A. Hennigs *et al.* [15] indicated that patients with lower clinical stages and higher response rates to NACT had a better chance of undergoing breast-conserving surgeries, while those with residual disease often required mastectomy.

Due to limited resources, BRCA status was not evaluated, which could facilitate more effective treatment strategies. Progression-free survival and overall survival after different NACT regimens were not evaluated, which could provide data regarding the long-term effects of the regimen. Therefore, this study highlights the response to NACT, wherein the clinical complete response was almost 50%, and the complete pathological response was 37%. No statistically significant associations were observed between age, menopausal status, tumour location, or tumour histology and the response; nor was there an association between the type of NACT and the response. The choice of surgical intervention significantly affected the clinical response.

Overall, the study conducted at this tertiary care centre aligns with international findings in many respects. The mean age and clinical characteristics in this Indian study are consistent with international trends, although some variations exist in histological types. The effectiveness of NACT in achieving downstaging and improving surgical options aligns with global studies, which demonstrate high rates of complete responses and increased rates of breast-conserving surgery.

The types of surgical interventions and their outcomes post-NACT are similar to those observed internationally, with an emphasis on breast-conserving surgery where possible. The correlation between clinical response to NACT and surgical options observed in the Indian study is consistent with international findings. Thus, this study contributes valuable insights into the effectiveness of NACT in a different demographic and clinical setting, reinforcing the general benefits observed globally while highlighting specific regional characteristics.

Conclusions

Of the initial 90 LABC patients considered, 78 were eligible for neoadjuvant chemotherapy. The mean age of the study patients was 47.5 years, and a significant portion of them were post-menopausal (52.6%). The majority had right breast involvement (55%) and invasive lobular carcinoma (57.7%).

The study aimed to assess both the clinical and pathological responses to neoadjuvant chemotherapy. A complete clinical response was observed in 47.43% of patients, while 37% exhibited a complete pathological response. However, no statistically significant associations were found between clinical characteristics (such as age, menopausal status, tumour location, and histological type) and either clinical or pathological response ($p > 0.05$). The findings did not reveal any statistically significant differences in clinical or pathological response based on the type of neoadjuvant chemotherapy regimen used ($p > 0.05$). This suggests that the effectiveness of different regimens in inducing tumour response was similar within the cohort studied. Although specific rates were not detailed, the study aimed to estimate breast conservation rates following neoadjuvant chemotherapy. This aspect

was likely impacted by the clinical response observed in patients, which significantly influenced the choice of surgical intervention ($p < 0.05$).

Importantly, clinical response to neoadjuvant chemotherapy significantly influenced the type of surgical intervention chosen for patients ($p < 0.05$). This underscores the critical role of accurately assessing treatment response to guide subsequent surgical decisions and optimise outcomes. In conclusion, while the study did not identify predictive clinical characteristics for treatment response to neoadjuvant chemotherapy in LABC patients, it highlighted the pivotal role of clinical response assessment in guiding surgical management decisions. Future research could further explore factors influencing response variability and refine strategies to enhance treatment outcomes in this patient population.

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Conflict of Interest

None.

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Клініко-патологічна реакція та консервація грудей у випадках місцево поширеного раку молочної залози з неоад'ювантною хіміотерапією

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Анотація. Неоад'ювантна хіміотерапія є важливою для покращення хірургічних результатів та можливості збереження грудної залози у випадках локально поширеного раку грудної залози, які в іншому випадку часто є неоперабельними. Метою цього проспективного когортного дослідження було оцінити клініко-патологічну відповідь та рівні збереження грудної залози у пацієнтів з локально поширеним раком грудної залози, які проходили неоад'ювантну хіміотерапію. Пацієнтам була проведена хіміотерапія за стандартним протоколом, і їхній стан було контролювано до отримання хірургічного результату. Із загальної кількості 90 пацієнтів з локально поширеним раком грудної залози в дослідженні лише 78 були допущені до неоад'ювантної терапії. Ці 78 пацієнтів з середнім віком 47,5 (9,4) років були включені в дослідження. Практично половина (52,6 %) пацієнтів перебували в постменопаузі; у 55 % (n = 43) було ураження правої молочної залози, а 57,7 % (n = 45) страждали на інвазивну лобулярну карциному. Практично 47,43 % пацієнтів показали повну клінічну відповідь, і лише 37 % мали повну патологічну відповідь, що не було пов'язано зі статусом естрогенових рецепторів, прогестеронових рецепторів та епідермального фактора росту людини ($p > 0,05$). Пацієнти з повною клінічною відповіддю мали вищі шанси на збереження грудної залози ($p < 0,05$). Було відзначено, що збереження грудної залози покращується завдяки неоад'ювантній хіміотерапії. Це дослідження допоможе лікарям покращити результати лікування пацієнтів з локально поширеним раком грудної залози

Ключові слова: поширений рак; інвазивний рак грудної залози; онкологічні результати; операція зі збереження грудної залози