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Clinicopathological Profile and Treatment Outcomes of Locally Advanced Breast Cancer: A Hospital-Based Study from Eastern India

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ABSTRACT

Background: Locally advanced breast cancer (LABC) accounts for 40–70% of breast cancer cases in India, but institution-specific clinicopathological data from resource-limited settings remain limited. This study aimed to characterize the clinicopathological features, hormone receptor status, and treatment outcomes of LABC patients at a tertiary care center.

Methods: A descriptive cross-sectional study of 100 female patients with LABC was conducted at VIMSAR, Burla, over 24 months (April 2023–April 2025). Patients underwent detailed clinical evaluation, imaging, core needle biopsy, and immunohistochemical profiling for estrogen receptor (ER), progesterone receptor (PR), and HER2/neu status. Treatment outcomes and early postoperative complications were documented.

Results: The median age was 45 years, with 60% of patients aged 40–60 years. Most patients (67%) presented at Stage IIIA–IIIB disease. IDC was the predominant histological type (84%). ER and PR positivity were observed in 60% and 53% of cases, respectively, whereas 27% were HER2/neu-positive and 20% were triple-negative. Eighty percent of patients received neoadjuvant chemotherapy (NACT), achieving partial or complete response in 74% of cases. Modified radical mastectomy was performed in 87% of surgically treated patients, with 69% experiencing uncomplicated postoperative recovery.

Conclusion: The predominance of advanced-stage disease at presentation underscores the need for early detection initiatives in India. The molecular heterogeneity of LABC and favorable response rates to NACT support the feasibility of multimodal treatment even in resource-limited settings. Institution-specific data facilitate evidence-based management and prognostication for this high-burden disease subset.

Key-words: Locally advanced breast cancer, Hormone receptors, HER2/neu, Neoadjuvant chemotherapy, Clinicopathological profile

INTRODUCTION

Breast cancer remains the most frequently diagnosed malignancy among women globally, with approximately 2.3 million new cases and 685,000 deaths reported annually according to GLOBOCAN 2020.[1]

In India, the epidemiological landscape of breast cancer has undergone a significant transformation, with the disease now surpassing cervical cancer as the leading malignancy in women. The estimated incidence in the Indian population stands at 25.8 per 100,000 women, with mortality rates around 12.7 per 100,000 women, contributing to nearly 14% of all cancer diagnoses.[2] Beyond its high incidence, the disease burden in India is compounded by patterns of late presentation; a substantial proportion of Indian women are diagnosed at advanced stages (Stage III or IV), in stark contrast to developed nations, where early-stage detection predominates.[3]

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A defining feature of breast cancer epidemiology in India is the extraordinarily high prevalence of locally advanced breast cancer (LABC). Whereas LABC accounts for only 10–20% of breast cancer cases in developed countries, it constitutes 40–70% of presentations in India and other low- and middle-income countries. LABC, defined by the AJCC TNM system as Stage IIB (T3 N0), Stage IIIA (T2–T3 N2), Stage IIIB (T4 any N), or Stage IIIC (any T, N3) without distant metastasis, represents a clinically heterogeneous spectrum of locally extensive tumors.[4] These include large primary tumors exceeding 5 cm, those with skin or chest wall involvement, and/or extensive regional lymph node involvement (fixed axillary, supraclavicular, or infraclavicular nodes). The high LABC burden in India is attributable to multiple interconnected factors: limited public awareness of breast cancer symptoms, sociocultural stigma, absence of organized mammographic screening programs, and significant gaps in healthcare accessibility, particularly in rural and semi-urban regions.[5]

The management of LABC has evolved considerably with advances in systemic therapy and molecular profiling. Multimodal approaches incorporating neoadjuvant chemotherapy (NACT), surgery, radiotherapy, and targeted therapies based on hormone receptor and HER2/neu status have improved locoregional control and survival outcomes.[6] Increasingly, immunohistochemical (IHC) assessment of estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2/neu) status is recognized as fundamental to treatment stratification. Luminal tumors (ER/PR-positive) respond to endocrine therapy, HER2-positive cases benefit from anti-HER2 agents, and triple-negative breast cancer (TNBC) remains challenging, relying primarily on chemotherapy and emerging immunotherapies.[7] Despite this progress, institution-specific clinicopathological data from resource-limited tertiary centers in India remain sparse, particularly from regions outside metropolitan cancer centers. Such localized data are essential for understanding regional disease patterns, informing treatment protocols, and optimizing patient outcomes.

The Department of General Surgery at VIMSAR, Burla, a semi-urban tertiary care institute in Odisha, East India, encounters a substantial caseload of LABC patients. However, systematic characterization of these patients—encompassing demographic features, clinical staging, histopathological subtypes, and molecular marker profiles—has not been previously undertaken. This study was designed to address this gap by conducting a comprehensive clinicopathological evaluation of LABC patients at this institution, thereby contributing localized evidence to support evidence-based management and prognostication in resource-constrained settings.

MATERIALS AND METHODS

Study Design and Setting- This was a descriptive, cross-sectional, hospital-based study conducted at the Department of General Surgery, Veer Surendra Sai Institute of Medical Sciences and Research (VIMSAR), Burla, Sambalpur, Odisha, India, from April 2023 to April 2025. The institution is a tertiary care teaching hospital serving a mixed urban and rural population across eastern Odisha. Patient recruitment occurred from both outpatient and inpatient departments, including surgical wards, operating theatres, and the pathology unit.

Study Population and Sample Size- The study population comprised female patients aged ≥18 years diagnosed with LABC as defined by AJCC TNM staging criteria (T3–T4 and/or N2–N3 without distant metastasis). Patients were included if they had clinical or radiological findings consistent with LABC, histopathological confirmation of breast carcinoma, and provided informed written consent. Exclusion criteria were: early-stage breast cancer (T1–T2, N0–N1), confirmed distant metastasis (Stage IV), patients deemed medically unfit for any active treatment, and those declining participation. A consecutive sampling technique was employed; all eligible patients presenting during the study period and meeting inclusion criteria were enrolled sequentially until the projected sample of 100 patients was achieved.

Clinical and Investigative Procedures- All enrolled patients underwent detailed clinical evaluation, including comprehensive history, menopausal status, family history, and symptom duration. Physical examination assessed tumor size, skin changes, nipple involvement, and regional lymphadenopathy. Imaging evaluation included bilateral mammography (BI-RADS classification), breast ultrasound with axillary assessment, and breast MRI in selected cases where chest wall or extensive skin involvement was suspected. Staging investigations (chest

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X-ray, abdominal ultrasound, and bone scan) were performed to exclude distant metastasis.

Tissue diagnosis was obtained via ultrasound-guided core needle biopsy (CNB), which is the gold standard for LABC. Tissue samples were preserved in 10% formalin and sent to the pathology laboratory for histopathological examination using H&E staining, histological grading, and immunohistochemical profiling. IHC for ER, PR, and HER2/neu was performed using standard protocols and interpreted according to ASCO/CAP guidelines. ER and PR positivity was defined as ≥1% nuclear staining (Allred score ≥3), while HER2/neu positivity was scored 3+ or confirmed as FISH-positive when IHC was equivocal (2+). Triple-negative status was defined as tumors that were ER-, PR-, and HER2/neu-negative.

Treatment and Outcomes Assessment- Treatment modalities were classified as follows: (1) neoadjuvant chemotherapy (NACT) followed by surgery; (2) primary surgery (Modified Radical Mastectomy or MRM); or (3) palliative/inoperable cases. Patients receiving NACT were evaluated for clinical response, categorized as complete response (CR), partial response (PR), stable disease (SD), or progressive disease (PD) based on imaging reassessment after chemotherapy completion. Surgical procedures were documented, including the type of surgery (MRM, breast-conserving surgery, or no surgery) and the extent of axillary lymph node dissection. Early postoperative complications, defined as events occurring within 30 days of surgery, were recorded and included surgical site infection, seroma, hematoma, and flap necrosis.

Statistical Analysis- Data were collected using a pre-designed pro forma and entered into password-protected Microsoft Excel spreadsheets with cross-verification for accuracy. Statistical analysis was performed using SPSS version 25.0 (IBM Corp.). Descriptive statistics (mean, median, standard deviation, percentages) characterized demographic and clinicopathological variables. Chi-square and Fisher's exact tests assessed associations between categorical variables (e.g., receptor status by age group). An independent sample t-test compared continuous variables across groups. $p<0.05$ was considered statistically significant. Patient confidentiality was maintained through the assignment of unique identification numbers and the removal of personal identifiers; physical records were locked, and digital files were password-protected.

Ethical Approval- The study received approval from the Institutional Ethics Committee (VIREC, VIMSAR) with approval number 216-2022/I-S-T/166 dated 17 June 2023. Written informed consent was obtained from all participants after explanation of the study objectives in English and Odia.

RESULTS

The study cohort comprised 100 female patients with LABC. Age distribution revealed a peak incidence in the 41–50-year age group (33 patients, 33%), followed by the 51–60-year group (27 patients, 27%). Patients aged >60 years accounted for 17%, those aged 31–40 for 16%, and those aged <30 for only 7%. This pattern demonstrates a clear mid-life predominance, with 60% of patients aged 40–60 years, underscoring the need for targeted screening initiatives in this demographic.

Clinical staging using AJCC TNM criteria (Table 1) revealed that Stage IIIB (T4 any N) was the most common presentation, accounting for 43 patients (43%). Stage IIIA (T2–T3, N2) was observed in 24 patients (24%), whereas Stage IIIC (any T, N3) was observed in 20 patients (20%). Stage IIB (T3 N0) was the least represented, with 13 patients (13%). Collectively, 63% of patients presented at Stage IIIB or above, indicating substantial local disease advancement. The predominance of T4 staging (43%) reflected significant skin involvement or chest wall fixation. In comparison, extensive nodal involvement (N2 and N3) was documented in 64% of patients, with many showing fixed or matted axillary and/or supraclavicular lymphadenopathy (Table 1).

Table 1: Clinical staging of LABC according to AJCC TNM classification

Clinical Stage	Definition	Number of Patients (n)	Percentage (%)
Stage IIB	T3 N0	13	13
Stage IIIA	T2–T3 N2	24	24
Stage IIIB	T4 any N	43	43
Stage IIIC	Any T N3	20	20
Total		100	100

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Among the cohort, 52 patients (52%) reported no known chronic comorbidities. Hypertension was the most prevalent comorbidity, documented in 24 patients (24%), followed by Type 2 Diabetes Mellitus in 16 patients (16%), and hypothyroidism in 8 patients (8%). The presence of metabolic comorbidities in nearly half the cohort has direct implications for treatment tolerance, perioperative risk, and long-term outcomes.

Histological examination (Table 2) revealed Invasive Ductal Carcinoma (IDC) as the predominant subtype, affecting 84 patients (84%). Invasive Lobular Carcinoma (ILC) accounted for 9 patients (9%), while other rare variants (mucinous and medullary carcinomas) comprised 7 patients (7%). This distribution aligns with global epidemiological patterns, with IDC being the most frequent subtype and typically associated with more aggressive behavior when presenting at advanced stages.

Table 2: Histopathological classification of LABC tumors

Histological Type	Number of Patients (n)	Percentage (%)
Invasive Ductal Carcinoma (IDC)	84	84
Invasive Lobular Carcinoma (ILC)	9	9
Other variants (Mucinous, Medullary)	7	7

Immunohistochemical profiling (Table 3) demonstrated substantial molecular heterogeneity within the LABC cohort. ER positivity was observed in 60 patients (60%), while PR positivity was documented in 53 patients (53%). HER2/neu positivity was found in 27 patients (27%), with the remaining 73 patients HER2/neu-negative. Triple-negative breast cancer (ER-negative, PR-negative, HER2/neu-negative) accounted for 20 patients (20%). This molecular distribution reveals that approximately 60% of the cohort would benefit from endocrine therapy, while HER2-positive cases represent potential candidates for targeted biological therapies. The 20% incidence of TNBC aligns with reported prevalence in Indian populations and underscores the therapeutic challenges posed by this subset.

Table 3: Hormone receptor and HER2/neu status distribution

Receptor Status	Number of Patients (n)	Percentage (%)
ER Positive	60	60
PR Positive	53	53
HER2/neu Positive	27	27
Triple Negative (ER–/PR–/HER2–)	20	20
Total Sample	100	100

Among the 100 patients, 80 (80%) received neoadjuvant chemotherapy followed by surgery—the current standard approach for LABC management. Primary surgery (Modified Radical Mastectomy) was performed in 17 patients (17%), representing cases that were either operable at presentation or for whom neoadjuvant chemotherapy was deemed inappropriate. Three patients (3%) were deemed inoperable due to extensive disease burden or poor general condition and were referred for palliative therapy or lost to follow-up.

Of the 97 patients who underwent or were indicated for surgery, Modified Radical Mastectomy (MRM) was performed in 87 patients (87% of the total cohort). Breast-Conserving Surgery (BCS) was achieved in only 8 patients (8%), reflecting the challenges of achieving adequate margins in LABC despite successful neoadjuvant downstaging. Five patients (5%) did not undergo surgery due to inoperability or loss to follow-up. The predominance of MRM reflects the practical reality of managing LABC in resource-limited settings, where large tumor burden, late-stage presentation, and limited access to postoperative radiotherapy infrastructure often preclude breast conservation.

Early postoperative outcomes were favorable, with 69 patients (69%) recovering without significant complications. Seroma was the most common complication, occurring in 13 patients (13%), followed by surgical site infection in 11 patients (11%). Hematoma and flap necrosis occurred in 4 patients (4%) and 3 patients (3%), respectively. These complication rates are acceptable for complex mastectomy procedures in a resource-limited setting and reflect appropriate surgical technique and perioperative care.

Among the 80 patients receiving neoadjuvant chemotherapy, tumor response was categorized using

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standard response evaluation criteria based on imaging reassessment. Partial response was observed in 46 patients (57.5% of chemotherapy-treated cohort), representing tumor reduction of >30% but <100%. Complete clinical response, defined as complete or near-complete tumor resolution on imaging, was achieved in 13 patients (16.3%). Stable disease, indicating <30% reduction, was documented in 17 patients (21.3%). Progressive disease, defined as an increase in tumor size despite chemotherapy, occurred in 4 patients (5%). Collectively, 59 patients (73.8% of those receiving NACT) demonstrated partial or complete response, indicating favorable chemosensitivity of the cohort.

Analysis of receptor status by age group revealed that ER/PR positivity was relatively consistent across age groups (56–65%), with a slight increase in patients >60 years (64.7%). HER2/neu positivity ranged from 23–31% across age groups, with the highest rates in the 41–50-year group (30.3%). Histological grade analysis demonstrated that ER/PR positivity remained stable at 60% across Grades 1–3, whereas HER2/neu positivity showed a trend toward higher prevalence in higher-grade tumors (Grade 3: 27.5% vs. Grade 1: 25%). These patterns support the notion that hormone receptor status is preserved across histological grades in LABC, while HER2 overexpression increases with tumor grade, necessitating more aggressive therapeutic approaches in higher-grade, HER2-positive cases.

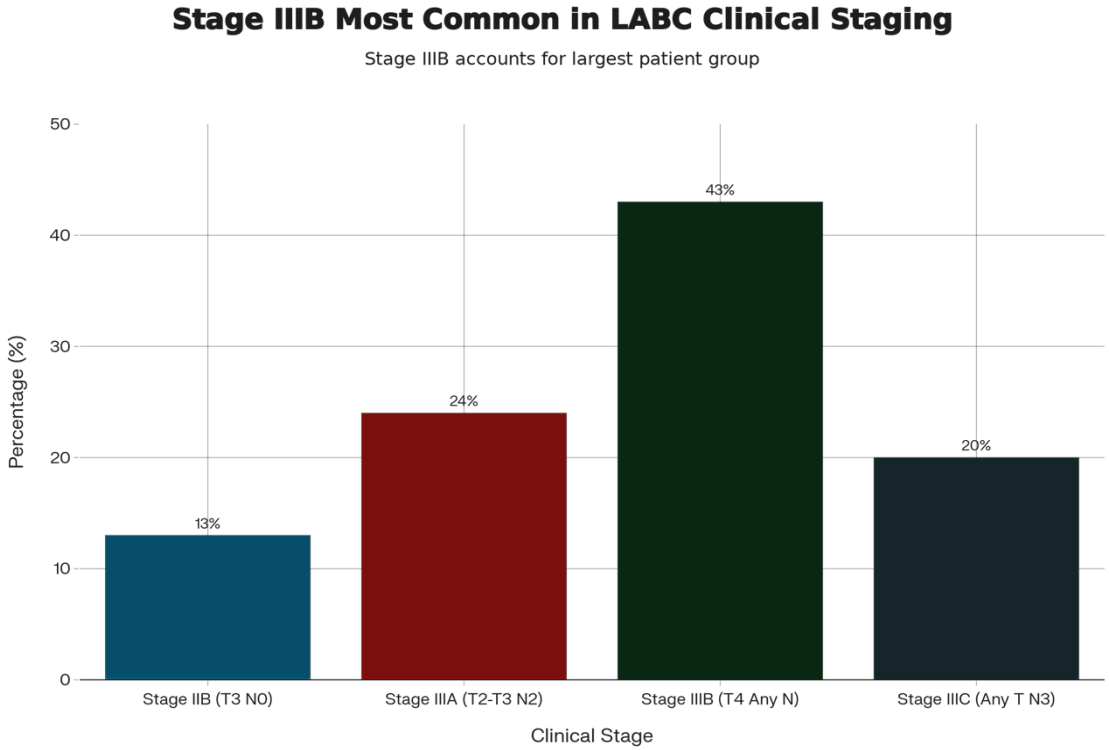

Fig. 1: Clinical staging distribution of LABC cases according to AJCC TNM classification

Chart demonstrates that Stage IIIB (T4 any N) was the most common presentation in 43% of cases (n=43), followed by Stage IIIA in 24% (n=24), Stage IIIC in 20% (n=20), and Stage IIB in 13% (n=13). This shows that 67% of patients presented at Stage IIIB or above, indicating substantial local disease advancement at the time of diagnosis.

The chart displays the distribution of LABC tumors by molecular subtype based on immunohistochemical profiling. Luminal tumours (ER/PR-positive) accounted for 53% of cases (n=53), indicating potential benefit from endocrine therapy. HER2-positive tumours accounted for 27% (n=27) and were candidates for anti-HER2 targeted therapies. Triple-negative breast cancer (ER-/PR-/HER2-) comprised 20% (n=20) of cases, presenting with aggressive biology and limited targeted treatment options beyond chemotherapy. This molecular heterogeneity necessitates receptor-based stratification for optimal treatment planning.

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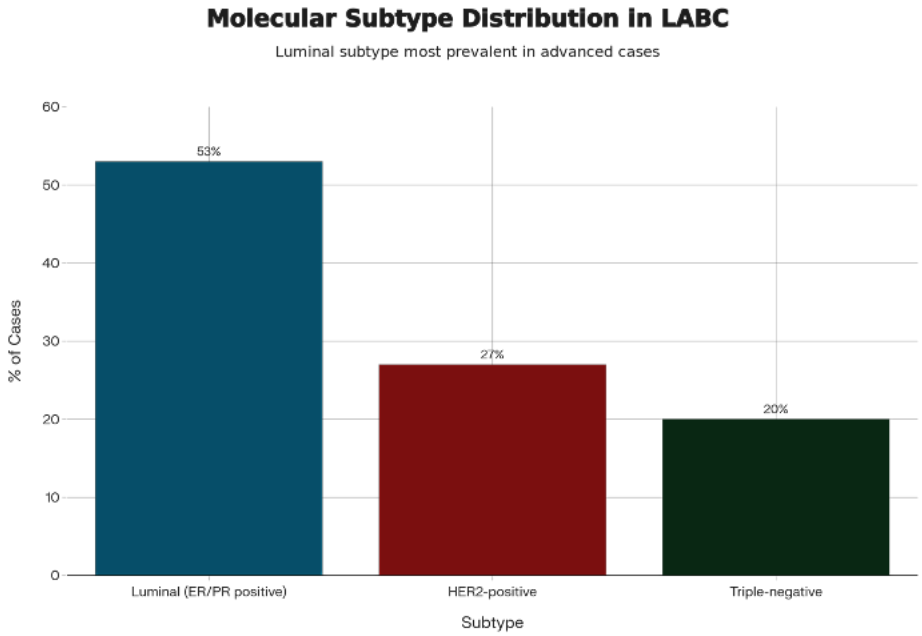

Fig. 2: Molecular subtype distribution of LABC based on hormone receptor and HER2/neu status

DISCUSSION

This hospital-based clinicopathological study provides institution-specific data on LABC presentation, molecular characteristics, and treatment outcomes at a tertiary care center in eastern India. The findings offer valuable insights into disease patterns in resource-limited settings and support evidence-based management strategies tailored to this population. The predominance of LABC in patients aged 40–60 years, accounting for 60% of the cohort, aligns with national epidemiological patterns indicating earlier onset of breast cancer in Indian women compared to Western populations. The median age of approximately 45 years reflects accelerated disease presentation, plausibly related to reproductive factors (early menarche, fewer children, shorter breastfeeding duration), obesity, and genetic predisposition in the Indian population.[8] Notably, 7% of patients were <30 years, underscoring the occurrence of breast cancer in younger cohorts, potentially indicating genetic susceptibility or aggressive tumor biology in this subgroup.

The overwhelming predominance of Stage IIIA–IIIB disease (67% of the cohort) represents a critical finding reflecting substantial diagnostic delays in the Indian healthcare system. This pattern is consistent with multiple published reports documenting that 40–70% of Indian breast cancer patients present with LABC at diagnosis, in stark contrast to developed nations, where early-stage disease predominates due to mammographic screening.[9] Contributing factors include inadequate awareness of breast cancer symptoms, fear and social stigma surrounding cancer diagnosis, absence of organized screening programs, and geographic barriers to accessing diagnostic and treatment facilities in rural and semi-urban regions.[10] The clinical implication is that future efforts to reduce LABC burden must address these upstream determinants through enhanced public health messaging, training of primary care providers in clinical breast examination, and establishment of tiered referral pathways for diagnostic confirmation.

The predominance of IDC (84%) reflects the histological spectrum observed in population-based cancer registries worldwide and supports the expectation that histologically aggressive types are overrepresented in LABC cohorts. The presence of ILC (9%) is clinically significant given its known propensity for late diagnosis due to subtle imaging features and higher risk of bilateral and contralateral involvement, necessitating careful contralateral breast surveillance in these patients.[11]

The receptor status distribution in this cohort—60% ER-positive, 53% PR-positive, and 27% HER2-positive—reflects the molecular heterogeneity of LABC and has direct therapeutic implications. The 60% ER/PR positivity rate is favorable, indicating that most patients are potential candidates for endocrine therapy as part of adjuvant or maintenance regimens. This is economically

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relevant in resource-limited settings, as hormone therapies (tamoxifen, aromatase inhibitors) are more affordable and accessible than targeted biological agents. The 27% HER2/neu positivity identifies a substantial subset requiring anti-HER2 therapies; however, access to trastuzumab and other HER2-directed agents remains limited in many Indian institutions due to cost, with generic biosimilar versions offering a more accessible alternative.[12]

The 20% incidence of triple-negative breast cancer (TNBC) in this cohort is notable and consistent with reports indicating higher TNBC prevalence in Indian women compared to Western populations.[13] TNBC is characterized by aggressive biology, early recurrence, and absence of targeted therapeutic options beyond chemotherapy. The recognition of TNBC in the diagnostic workup is thus imperative, as these patients may benefit from clinical trials evaluating immune checkpoint inhibitors or PARP inhibitors if BRCA mutations are identified—emerging options that require institutional capacity for genetic testing and specialized oncology support.

The observation that 74% of patients receiving NACT (partial or complete response) demonstrates reasonable chemosensitivity of LABC tumors in this cohort, supporting the standard practice of neoadjuvant approaches for downstaging. Notably, only 5% experienced progressive disease, suggesting that the chemotherapy regimens employed were well-tolerated and effective. Complete pathological response (CR: 16.3%) is associated with improved disease-free survival in published literature, particularly in HER2-positive and triple-negative subtypes, and these patients represent a favorable prognostic group.[14] The partial response group (57.5%), while not achieving complete remission, still experienced substantial tumor regression facilitating surgical resection. These response rates validate the neoadjuvant strategy in LABC and underline the importance of accurate molecular profiling for tailoring systemic therapy regimens (e.g., addition of trastuzumab for HER2-positive cases, integration of taxanes for optimal response).

The preponderance of MRM (87%) reflects pragmatic surgical decision-making in a resource-limited setting, where factors such as large residual tumor size post-NACT, patient preference, surgeon expertise, and unavailability of reliable postoperative radiotherapy infrastructure limit breast-conserving approaches. While recent literature emphasizes that selected LABC patients with favorable response to NACT can safely undergo BCS followed by radiotherapy, implementation of this strategy requires infrastructure (postoperative breast MRI for margin assessment, facilities for frozen section analysis, and assured access to radiotherapy) that may not be universally available.[15] The 8% BCS rate, though modest, represents progress in expanding breast conservation in advanced disease when circumstances permit, and warrants continued efforts to expand this option through institutional capacity building.

Early postoperative complications (seroma 13%, surgical site infection 11%) are consistent with published rates for complex mastectomy procedures and reflect acceptable surgical outcomes in the cohort [8,12]. The 69% complication-free rate is reassuring and suggests effective perioperative care. However, minimization of seroma and infection through techniques such as meticulous hemostasis, routine axillary drainage, prompt drain removal, and infection prevention protocols remains essential to avoid delays in adjuvant therapy [9].

Several aspects of this study illuminate the challenges and opportunities for LABC management in resource-constrained environments. First, the effective incorporation of neoadjuvant chemotherapy—evident from favorable response rates and improved operability—demonstrates that multimodal oncology is feasible even in semi-urban tertiary centers lacking sophisticated infrastructure [4,6]. Second, the integration of immunohistochemical receptor profiling into diagnostic pathways, while requiring specialized expertise, has become increasingly accessible through training and quality assurance initiatives in Indian pathology services. Third, the study underscores the feasibility of performing high-complexity surgical procedures (MRM with axillary dissection) with acceptable morbidity in public hospitals serving mixed populations [7,11].

However, significant barriers remain. Financial constraints limit access to targeted therapies (trastuzumab, pertuzumab) and extended hormone therapy. Loss to follow-up, evident in the 3% inoperable/palliative cohort, reflects logistical challenges in patient retention through multimodal treatment sequences. Future initiatives should prioritize: (1) strengthening primary care capacity for early detection;

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(2) streamlining diagnostic pathways to reduce time from symptom to definitive diagnosis; (3) establishing affordability mechanisms for systemic therapies; and (4) implementing robust follow-up systems to ensure treatment completion.

This cross-sectional descriptive study captures baseline disease characteristics and short-term outcomes; long-term follow-up data on recurrence, disease-free survival, and overall survival were not available within the study timeframe. The single-institution design, while providing locally relevant data, limits generalizability to other regions or healthcare systems. Additionally, a small proportion of patients (3%) were inoperable or lost to follow-up, preventing comprehensive outcome analysis in the entire cohort. Future prospective studies with extended follow-up would provide valuable prognostic insights and treatment efficacy data.

This clinicopathological study characterizes LABC presentation and early treatment outcomes at a tertiary care center in eastern India, contributing institution-specific evidence to the literature on this high-burden disease subset. The predominance of advanced-stage disease at presentation (67% at Stage IIIA or higher) underscores the urgent need for earlier detection initiatives, enhanced public awareness, and strengthened referral pathways. The molecular heterogeneity of the cohort—with 60% hormone receptor-positive, 27% HER2-positive, and 20% triple-negative tumors—reflects the spectrum of treatment opportunities and challenges [5,10].

CONCLUSIONS

The present study demonstrates that multimodal management of breast cancer is feasible in resource-limited tertiary care settings, as reflected by the favorable response to neoadjuvant chemotherapy (74%) and acceptable surgical outcomes. However, the predominant use of mastectomy, early postoperative complications in some patients, and treatment interruptions in a small subset indicate persisting gaps in infrastructure, clinical resources, and system efficiency. These findings highlight the need for strengthening institutional capacity, improving surgical and perioperative care, and expanding access to breast-conserving treatment through better availability of radiotherapy services. Ensuring equitable access to targeted therapies and standardized institution-specific treatment protocols will also be important for optimizing patient outcomes. Long-term prospective studies with extended follow-up are required to evaluate disease-free survival, overall survival, and quality-of-life outcomes in this population. Overall, the findings of this study provide clinically relevant insights that may help inform regional oncology practices and support ongoing efforts to improve breast cancer management in similar resource-limited settings.

CONTRIBUTION OF AUTHORS

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Research design- Rabinarayan Guru, Satya Brata Thakur
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Materials- Rabinarayan Guru, Satya Brata Thakur
Data collection- Rabinarayan Guru, Satya Brata Thakur
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Critical review- Kumuda Bandhu Sahoo
Article editing- Rabinarayan Guru, Satya Brata Thakur
Final approval- Kumuda Bandhu Sahoo

REFERENCES

[1] Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin., 2021; 71: 209-49.

[2] Mathur P, Sathishkumar K, Chaturvedi M, Das P, Sudarshan KL, et al. Cancer statistics, 2020: Report from National Cancer Registry Programme, India. JCO Glob Oncol., 2020; 6: 1063-75.

[3] Chopra R. The Indian scene. J Clin Oncol., 2001; 19(18 Suppl): 106S-11S.

[4] Eifel P, Axelson JA, Costa J, Crowley J, Curran WJ, et al. National Institutes of Health consensus development conference statement: Breast cancer screening for women ages 40–49. J Natl Cancer Inst., 2010; 102: 115-25.

[5] Bray F, Laversanne M, Weiderpass E, Soerjomataram I. The ever-increasing importance of cancer as a leading cause of premature death worldwide. Cancer, 2021; 127: 3029-30.

[6] Schmid P, Adams S, Rugo HS, Schneeweiss A, Barrios CH, et al. Atezolizumab and nab-paclitaxel in

doi: 10.21276/SSR-IIJLS.2026.12.2.10

advanced triple-negative breast cancer. N Engl J Med., 2018; 379: 2108-21.

[7] Dowsett M, Nielsen TO, A'Hern R, Bartlett J, Coombes RC, et al. Assessment of Ki67 in breast cancer: Recommendations from the International Ki67 in Breast Cancer Working Group. J Natl Cancer Inst., 2011; 103: 1656-64.

[8] Lin NU, Vanderplas A, Hughes ME, Theriault RL, Edge SB, et al. Clinicopathologic features, patterns of recurrence, and survival among women with triple-negative breast cancer. Cancer, 2012; 118: 5463-72.

[9] Bhattacharyya T, Sharma SC, Yadav BS, Singh R, Singh G. Outcome of neoadjuvant chemotherapy in locally advanced breast cancer: A tertiary care centre experience. Indian J Med Paediatr Oncol., 2014; 35: 215-20.

[10]Jain AK. Locally advanced breast cancer: Response evaluation to neoadjuvant chemotherapy by clinico-histopathological parameters and molecular imaging. Indian J Surg Oncol., 2023; 14: 279-87.

[11]Brackstone M, Fletcher GG, Dayes IS, Madarnas Y, SenGupta SK, et al. Locoregional therapy of locally advanced breast cancer: A clinical practice guideline. Curr Oncol., 2015; 22: S54-66.

[12]Miglietta L, Morabito F, Provinciali N, Canobbio L, Meszaros P, et al. A prognostic model based on combining estrogen receptor expression and Ki-67 value after neoadjuvant chemotherapy predicts clinical outcome in locally advanced breast cancer. Eur J Surg Oncol., 2013; 39: 1046-52. doi: 10.1016/j.ejso.2013.06.024.

[13]Sharma S, Rathore SS, Verma V, Kalyan M, Singh N, et al. Molecular subtypes as emerging predictors of clinicopathological response to neoadjuvant chemotherapy in locally advanced breast cancer. Cureus, 2022; 14: e25229. doi: 10.7759/cureus.25229.

[14]Stamatovic L, Susnjar S, Gavrilovic D, Minic I, Ursulovic T, et al. The influence of breast cancer subtypes on the response to anthracycline neoadjuvant chemotherapy in locally advanced breast cancer patients. J BUON., 2018; 23: 1273-80.

[15]Agrawal S, Banswal L, Saha A, Arun I, Datta SS, et al. Progesterone receptors, pathological complete response and early outcome for locally advanced breast cancer. Indian J Surg Oncol., 2016; 7: 397-406. doi: 10.1007/s13193-016-0523-3.