Clinicopathological profile and outcomes in young Indian patients with breast cancer: A single-center experience

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ABSTRACT

- Breast cancer is the most common malignancy in Indian women, with an earlier onset compared to Western countries. This retrospective study analyzed 102 breast cancer patients aged ≤40 years treated at HCG Aastha Cancer Center, Ahmedabad (January 2023–February 2025), to evaluate their clinicopathological features, treatment patterns, and outcomes. The median age at diagnosis was 36 years, invasive ductal carcinoma was the predominant histology (95.1%), stage II was most common at presentation (50%), Hormone receptor positive, HER2neu negative tumors were the most frequent subtype (41.1%), Genetic testing, performed in 39.2% of patients, identified pathogenic variants in 18.6%, primarily BRCA mutations. Breast-conserving surgery(BCS) and MRM were done in 33.3% and 32.4%, respectively. Neoadjuvant chemotherapy was given to 27.4% of patients, with pCR achieved in 17.8% of them. During follow-up, recurrence occurred in 10.8%, mainly bone and visceral sites.
- Overall, young Indian women often present with advanced, HR-positive disease and significant hereditary risk, highlighting the need for earlier detection, wider biomarker/genetic testing, and comprehensive multidisciplinary care.

INTRODUCTION

- Breast cancer is the most common malignancy among Indian women and often presents at ≤40 years of age, leading to distinct clinical, biological, and psychosocial challenges.[1,2]
- Despite improvements in diagnostics and therapy, variations exist in access to genetic testing, imaging, and multidisciplinary care, contributing to heterogeneous real-world outcomes in this population.[3]

MATERIALS AND METHODS

- **Study design:** Retrospective, single-center analysis (Jan 2023 – Feb 2025).
- **Population:** 102 female patients aged ≤40 years.
- **Data collected:** Demographics, histology, receptor status, germline mutations, staging, treatment modalities, recurrence outcomes.
- **Statistical analysis:** Descriptive statistics with percentage distribution.

Table 1. Patient demographics and clinicopathological profile (N=102)

Demographics & characteristics	n (%)
Median age, years (range)	36 (21-40)
Nulliparous	5 (4.9)
Family history of malignancy	25 (24.5)
Germline testing	
Germline mutation positive	19 (18.6)
Germline mutation-VUS	5 (4.9)
Germline mutation negative	16 (15.7)
Tumor Histology	
Invasive Ductal carcinoma (IDC)	97 (95.1)
Metaplastic	1 (0.9)
Mucinous	1 (0.9)
Paget's disease of nipple	1 (0.9)
N/A	2 (1.9)
Stage at Diagnosis	
Stage I	10 (9.8)
Stage II	52 (50.9)
Stage III	19 (18.6)
Stage IV	20 (19.6)

RESULTS

Demographics & characteristics	n (%)
Tumor receptor status	
HR positive/Her2neu- negative	42 (41.1)
HR positive/Her2neu- positive	31 (30.4)
HR negative/Her2neu-positive	9 (8.8)
Triple negative (TNBC)	15 (14.7)
Imaging on diagnosis	
3D Mammography with Tomosynthesis	92 (90)
MRI breast	5 (4.9)

Table 2. Therapeutic management and clinical outcomes

Parameter	Category	n (%)
Surgical management	Breast-conservating surgery (BCS)	34 (33.3)
	Modified Radical Mastectomy (MRM)	33 (32.4)
Systemic therapy	Neo-adjuvant chemotherapy (NACT)	28 (27.4)
	Pathological complete response (pCR)	5/28 (17.8)
Clinical outcomes and follow-up	No recurrence	48 (47.1)
	Recurrence	11 (10.8)
	Lost to Follow-up	41 (40.2)
Site of recurrence	Bone and visceral	5 (4.9)
	Bone only	2 (1.9)
	Brain only	2 (1.9)
	Visceral only	2 (1.9)

DISCUSSION

- This single-institution study describes the distinct clinicopathological features of breast cancer in young Indian women. The median age was 36 years, suggesting earlier onset compared to Western populations.[4]
- Most patients presented with stage II (50.9%) followed by de novo metastatic diseases(19.6%), reflecting poor awareness, limited screening, and socioeconomic barriers.
- Although young breast cancer is often assumed to be triple negative, this cohort showed predominance of HR- positive (71.5%) and Her2neu positive (39.2%) disease. Nulliparity was uncommon (4.9%) in this cohort of Indian patients.
- Germline mutations were detected in 18.6% of those tested, but only 39.2% underwent genetic testing, indicating major gaps in hereditary cancer screening.
- Digital breast tomosynthesis improved detection in dense breasts specially detecting multicentric and multifocal disease, while MRI and PET-CT enhanced assessment in selected patients.
- Treatment included both BCS and MRM, with pCR rate of 17.8% after NACT. Recurrence occurred in 10.8%, and high lost to follow-up remains a major limitation.

CONCLUSION

- Indian women with breast cancer show a unique pattern of younger onset and predominantly HR positive and Her2neu positive disease.
- Germline mutation detected in 18.6% patients highlighting need for genetic counselling and testing.
- 10.8% recurrence rate seen in short follow up time suggesting biologically aggressive disease, highlighting strengthening of multidisciplinary care and survivorship programs to improve outcomes.

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Abbreviations: BCS, breast-conserving surgery; HER2, human epidermal growth factor receptor 2; MRI, magnetic resonance imaging; MRM, modified radical mastectomy; NACT, neoadjuvant chemotherapy; pCR, pathological complete response; PET-CT, positron emission tomography–computed tomography; TNBC, triple-negative breast cancer; VUS, variant of uncertain significance.

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