Original Article

Clinicopathological Study of Carcinoma Breast — A Study of 50 Cases

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ABSTRACT

Introduction: The study of carcinoma of the breast, a prevalent malignancy affecting women worldwide, is crucial for advancing medical knowledge and improving patient outcomes. This study aims to explore the various clinical presentations, risk factors, and histopathological features associated with breast carcinoma. Methods & Materials: This descriptive, cross-sectional study was conducted over one year from January 2023 to December 2023 at a tertiary care hospital in a rural area to assess the clinico-pathological characteristics of carcinoma breast among female patients. The study included 50 female patients diagnosed with carcinoma breast. Data were entered into a database and analyzed using statistical software (SPSS version 26.0). Results: In a study of 50 breast carcinoma patients, 60% of cases occurred in the left breast and 40% in the right. The most common symptom was a breast lump (50%), followed by lumps with ulceration (20%), pain (12%), axillary swelling (8%), and skin fixation (4%). Nipple retraction was observed in 40% of cases, and the upper outer quadrant was the most frequently involved area (62%). Tumor sizes were predominantly T2 (46%), with 36% of patients showing no palpable axillary lymph nodes. FNAC diagnosed 95.3% as malignant with 100% specificity and 95.3% sensitivity. Histopathological analysis found 100% of poorly differentiated tumors had positive lymph node involvement, compared to 70% of moderately and 50% of well-differentiated tumors. Conclusion: This study underscores a predominance of late-stage diagnosis, with many patients presenting with advanced disease, highlighting the need for early detection strategies.

Keywords: Carcinoma Breast, Clinical feature, Lymph node, Menarche, Menopause

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INTRODUCTION

Breast carcinoma remains a major public health concern worldwide. According to the World Health Organization (WHO), it is the most frequently diagnosed cancer among women, with over 2 million new cases reported annually[1]. The incidence rates vary significantly across different regions, with higher rates in developed countries. Several risk factors have been identified, including genetic predisposition (BRCA1 and BRCA2 mutations), hormonal influences (early menarche, late menopause, hormone replacement therapy), lifestyle factors (obesity, alcohol consumption, sedentary lifestyle), and reproductive history (nulliparity, late age at first childbirth)[2,3]. Breast carcinoma encompasses a wide range of histological subtypes, each with distinct pathological features and clinical implications. The most common subtype is invasive ductal carcinoma (IDC), which accounts for approximately 70-80% of all cases[4]. Other notable subtypes include invasive lobular carcinoma (ILC), mucinous carcinoma, tubular carcinoma, and medullary carcinoma. These subtypes are further categorized based on hormone receptor status (estrogen receptor [ER], progesterone receptor [PR]) and human epidermal growth factor receptor 2 (HER2) status, which are critical for determining prognosis and guiding treatment[5]. The clinical presentation of breast carcinoma can vary widely, ranging from asymptomatic cases detected through routine screening to advanced disease with significant symptoms. Common clinical manifestations include a palpable breast lump, changes in breast shape or size, skin dimpling, nipple discharge, and axillary lymphadenopathy[6]. Early detection through mammography screening has been shown to significantly improve survival rates, highlighting the importance of regular screening programs, especially in high-risk populations[7]. Accurate diagnosis of breast carcinoma requires a multidisciplinary approach, integrating clinical examination, imaging studies, and pathological evaluation. Imaging modalities such as mammography, ultrasound, and magnetic resonance imaging (MRI) play a pivotal role in detecting and characterizing breast lesions[8]. Fine-needle aspiration cytology (FNAC), core needle biopsy, and excisional biopsy are commonly used techniques for obtaining tissue samples for histopathological examination. Immunohistochemical (IHC) staining for ER, PR, and HER2 is

essential for determining the molecular subtype of the tumor, which guides therapeutic decisions[9]. The management of breast carcinoma is highly individualized, taking into account the tumor's stage, histological subtype, molecular profile, and patient preferences. Treatment modalities include surgery, radiation therapy, chemotherapy, hormone therapy, and targeted therapy. Surgical options range from breast-conserving surgery (lumpectomy) to mastectomy, often accompanied by sentinel lymph node biopsy or axillary lymph node dissection [10]. Adjuvant therapies, such as radiation and chemotherapy, are tailored based on the risk of recurrence and the presence of specific molecular targets. Hormone therapy (e.g., tamoxifen, aromatase inhibitors) is indicated for hormone receptor-positive tumors, while HER2-positive tumors benefit from targeted agents like trastuzumab[11]. This study aimed to assess the clinico-pathological study of carcinoma breast

METHODS & MATERIALS

This descriptive, cross-sectional study was conducted over one year from January 2023 to December 2023 at a tertiary care hospital in a rural area to assess the clinico-pathological characteristics of carcinoma breast among female patients. The study included 50 female patients diagnosed with carcinoma breast, selected consecutively as they presented to the outpatient and inpatient departments. Women aged 18 years and above with a confirmed histopathological diagnosis of breast carcinoma were included, while those with recurrent breast cancer, prior treatment for breast cancer, or other malignancies were excluded. Data collection involved a structured questionnaire. Tumors were staged according to the American Joint Committee on Cancer (AJCC) TNM staging system, incorporating clinical and radiological assessments such as mammography, ultrasound, and computed tomography (CT) scans to determine the TNM stage. Data were entered into a database and analyzed using statistical software (SPSS version 26.0).

RESULTS

The age distribution of the patients showed that the majority were between 30 to 39 years old (30.0%), followed closely by those aged 40 to 49 years (28.0%). Patients under the age of 30 comprised 12.0% of the cohort, while those aged 50 to 59 represented 10.0%. Patients aged 60 and above accounted for 20.0% of the cases. The mean age of the patients was 43.64 years, with a standard deviation of 14.41 years, indicating a broad age range among the participants Regarding the place of residence, a significant majority of the patients (78.0%) were from rural areas, whereas 22.0% resided in urban locations. This disparity highlights a potential geographic variation in the incidence or reporting of breast carcinoma cases. Marital status data revealed that an overwhelming 96.0% of the patients were married, with only 4.0% being

Socio-economic status of the patients indicated that a substantial proportion (62.0%) belonged to the poor socio-economic class. Those from the middle socio-economic class made up 32.0% of the study population, and a small fraction (6.0%) were categorized as well-off. These figures suggest that breast carcinoma affects individuals across different economic strata, with a notable prevalence among those with lower socio-economic status (Table I).

Table – I: Demographic characteristics of the study patients (*n*=50)

Demographic characteristics	Frequency	Percentage
Age (years)		
<30	6	12.0
30-39	15	30.0
40-49	14	28.0
50-59	5	10.0
≥60	10	20.0
Mean age	43.64	±14.41
Residence		
Rural	39	78.0
Urban	11	22.0
Marital status		
Married	48	96.0
Unmarried	2	4.0
Socio-economic status		
Poor	31	62.0
Middle	16	32.0
Well-off	3	6.0

Parity status revealed that a vast majority of the patients (94.0%) had given birth (primi), while 6.0% were nulliparous, indicating that childbirth is common among those diagnosed with breast carcinoma. Regarding the menopausal state, 64.0% of the patients were pre-menopausal, whereas 36.0% were post-menopausal, suggesting a higher prevalence of breast carcinoma in pre-menopausal women within the study group. When considering the age at first pregnancy among the 48 women who had children, 75.0% had their first pregnancy at or before the age of 25, and 25.0% had their first pregnancy after the age of 25. This data points towards early age of first pregnancy being a common characteristic among the patients. Breastfeeding practices showed that an overwhelming 90.0% of the mothers practiced exclusive breastfeeding, whereas 4.0% used artificial feeding methods. Additionally, 6.0% of the patients had no children. Family history of breast cancer was reported in 6.0% of the patients, indicating a relatively low incidence of familial breast cancer in this cohort. The use of oral contraceptives was reported by 46.0% of the patients, suggesting a notable prevalence of contraceptive use among the women diagnosed with breast carcinoma. Lastly, 10.0% of the patients had concomitant illnesses, reflecting the presence of other health conditions alongside breast cancer (Table II).

unmarried. This high percentage of married individuals might reflect the demographic patterns of the population studied.

Table – II: Risk factors of the study patients (*n*=50)

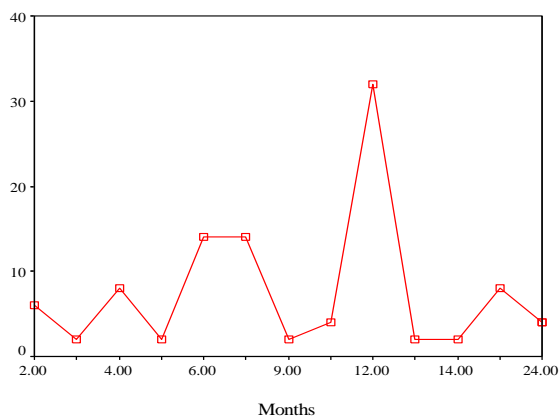| Parity	Frequency	Percentage
Nulli	3	6.0
Primi	47	94.0
Menopausal state		
Pre-menopausal	32	64.0
Pos-menopausal	18	36.0
Age at first pregnancy (n=48)		
≤25	36	75.0
>25	12	25.0
Breast feeding		
Exclusive breast feeding	45	90.0
Artificial feeding	2	4.0
No child	3	6.0
Family history of breast cancer	3	6.0
Use of oral contraceptives	23	46.0
Concomitant illness	5	10.0

Figure – 1: Duration of symptoms of the study patients

The median duration of the presenting symptom on admission was 9.92±5.13 months with range from 2 to 24 months (figure 1).

It was found that breast cancer occurred more frequently in the left breast, with 60.0% of the cases (30 patients) being diagnosed on this side. In contrast, 40.0% of the cases (20 patients) were diagnosed in the right breast. The predominant symptom reported was the presence of a breast lump, specifically, 50.0% of the patients presented with a breast lump only. Additionally, 20.0% of the patients had a breast lump accompanied by ulceration, and 12.0% experienced breast lump with associated breast pain. A breast lump with axillary swelling was reported by 8.0% of the patients, while 4.0% had a breast lump with skin fixation. Nipple retraction was observed in 40.0% of the cases, while nipple deviation was noted in 20.0%. Ulceration was present in 20.0% of the patients, and 24.0% exhibited skin fixation over the breast lump. The upper outer quadrant of the breast was the most frequently involved area, with 62.0% of the cases (31 patients) presenting malignancy in this region, while the axillary tail was the least commonly involved area, with 2.0% of the cases. [Table III].

Table – III: Distribution of patients based on clinical features of Breast cancer (*n*=50)

Side of breast	Frequency	Percentage
Right	20	40.0
Left	30	60.0
Symptoms	**Frequency**	**Percentage**
Breast lump only	25	50.0
Breast lump with Ulceration	10	20.0
Breast lump with Breast pain	6	12.0
Breast lump with axillary swelling	4	8.0
Skin fixed with Breast lump	2	4.0
Breast lump with Nipple discharge	1	2.0
Axillary swelling only	1	2.0
Breast lump with low back pain	1	2.0
Signs	**Frequency**	**Percentage**
Breast mass	49	98.0
Palpable axillary lymph node	32	64.0
Nipples retraction	20	40.0
Nipples deviation	10	20.0
Ulceration	10	20.0
Fixity to the skin	12	24.0
Puckering	8	16.0
Peau d'orange	3	6.0
Axillary swelling only	1	2.0
Nodules	1	2.0
Fixity to deep structures	1	2.0
Area of breast involved	**Frequency**	**Percentage**
Upper outer	31	62.0
Upper inner	6	12.0
Lower outer	8	16.0
Lower inner	2	4.0
Central	2	4.0
Axillary tail	1	2.0

Regarding tumor size, the most common tumor size was T2, with dimensions between 2 and 5 cm, found in 46.0% of the patients (23 cases), Larger tumors, classified as T3, which are greater than 5 cm, were observed in 16.0% of the patients (8 cases). Additionally, 28.0% of the patients (14 cases) presented with T4 tumors, During clinical examination, 36.0% of the patients (18 cases) were found to have no clinically palpable axillary lymph nodes (N0). The majority, 48.0% (24 cases), had clinically palpable lymph nodes classified as N1, indicating involvement of movable ipsilateral level I, II axillary lymph nodes. Per-operative findings revealed a different distribution. N1 lymph nodes were found in 30.0% of the patients (15 cases), while 24.0% (12 cases) were classified as N2. Stage I breast cancer was observed in 10.0% of the cases (5 patients), Stage IIa was identified in 20.0% of the cases (10 patients), denoting a tumor size larger than 2 cm but not exceeding 5 cm, and/or spread to 1-3 nearby lymph nodes. Stage IIb was diagnosed in 22.0% of the cases (11 patients), Stage IIIa, IIIb, and IV breast cancers were observed in 18.0% (9 patients), 26.0% (13 patients), and 4.0% (2 patients) of the cases, respectively. [Table IV].

Table – IV: Distribution of patients according to size of tumor and lymph node status (*n*=50)

Size of tumour	Frequency	Percentage
T_1 (<2 cm)	5	10.0
T_2 (2-5 cm)	23	46.0
T_3 (>5 cm)	8	16.0
T_4	14	28.0
Lymph node status	**Frequency**	**Percentage**
Clinical examination		
N0	18	36.0
N1	24	48.0
N2	08	16.0
Per-operative findings		
N0	01	2.0
N1	15	30.0
N2	12	24.0
Not examined	22	44.0
Stage	**Frequency**	**Percentage**
I	5	10.0
IIa	10	20.0
IIb	11	22.0
IIIa	9	18.0
IIIb	13	26.0
IV	2	4.0

Table V illustrates the relationship between clinical stage of breast cancer and age groups among the 50 patients in the study. The data is segmented by age groups (<30 years, 30-39 years, 40-49 years, 50-59 years, and ≥60 years) to examine the distribution of clinical stages within each group. For patients aged less than 30 years, 20.0% (1 out of 5) were diagnosed with Stage I breast cancer, while 9.5% (2 out of 21) were at Stage II, 9.1% (2 out of 22) were at Stage III, and 50.0% (1 out of 2) were at Stage IV. In the age group of 30-39 years, none of the patients were diagnosed with Stage I breast cancer. Instead, 28.6% (6 out of 21) were at Stage II, 40.9% (9 out of 22) were at Stage III, and none were at Stage IV. Among patients aged 40-49 years, 40.0% (2 out of 5) were diagnosed with Stage I breast cancer, 33.3% (7 out of 21) were at Stage II, 18.2% (4 out of 22) were at Stage III, and 50.0% (1 out of 2) were at Stage IV. In the 50-59 years' age group, none were diagnosed with Stage I breast cancer. Instead, 19.0% (4 out of 21) were at Stage II, 4.5% (1 out of 22) were at Stage III, and none were at Stage IV. For patients aged 60 years and above, 40.0% (2 out of 5) were diagnosed with Stage I breast cancer, 9.5% (2 out of 21) were at Stage II, 27.3% (6 out of 22) were at Stage III, and none were at Stage IV.

Table – V: Relation between clinical stage and age group (*n*=50)

Stage		<30 years (n=6)		30-39 years (n=15)		40-49 years (n=14)		50-59 years (n=5)		≥60 years (n=10)	
	n	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
I	5	1	20.0	0	0.0	2	40.0	0	0.0	2	40.0
II	21	2	9.5	6	28.6	7	33.3	4	19.0	2	9.5
III	22	2	9.1	9	40.9	4	18.2	1	4.5	6	27.3
IV	2	1	50.0	0	0.0	1	50.0	0	0.0	0	0.0

Out of 43 patients, two (4.7%) patients were reported benign and 41(95.3%) patients were diagnosed as malignant by FNAC. In histopathology report all patients were diagnosed as malignant. Two cases therefore were false negative. Specificity of FNAC was calculated to be 100.0% and sensitivity was 95.3%. Forty-three (86.0%) patients confirmed malignancy by FNAC, 5(10.0%) by incisional Biopsy and 2(4.0%) by excisional Biopsy (Table VI).

Table – VI: Comparison between FNAC and histopathology report in malignant (*n*=50)

Report	FNAC		Histopathology	
	n	%	*n*	%
Benign	2	4.7	0	0.0
Suggestive	1	2.3	0	0.0
Malignant	40	93.0	43	100.0
Total	43	100.0	43	100.0

Table VII explores the relationship between histopathological grades and histological lymph node involvement among 50 patients. For the 2 patients with well-differentiated tumors, 50.0% (1 patient) had positive lymph node involvement, and 50.0% (1 patient) had negative lymph node involvement. Among the 20 patients with moderately differentiated tumors, 70.0% (14 patients) had positive lymph node involvement, while 30.0% (6 patients) had negative lymph node involvement. For the 6 patients with poorly differentiated tumors, all 100.0% (6 patients) had positive lymph node involvement, with none having negative lymph node involvement.

Table – VII: Relation of histological lymph node involvement with grade (*n*=50)

Histopathological grade		Histological lymph node involvement			
		Positive (n=21)		Negative (n=7)	
n		*n*	%	*n*	%
Well differentiated	2	1	50.0	1	50.0
Moderately differentiated	20	14	70.0	6	30.0
Poorly differentiated	6	6	100.0	0	0.0

DISCUSSION

This study's demographic profile of breast cancer patients predominantly features women aged 30-49, representing 58% of the cohort, with a mean age of 43.64 years. This is consistent with findings from other studies in low- and middle-income countries (LMICs), where breast cancer often affects younger women compared to high-income countries[12,13]. The high percentage of rural patients (78.0%) reflects the limited access to healthcare facilities and cancer screening programs[14]. The socio-economic status data reveals that 62.0% of patients were from a poor socio-economic class, a common finding in low- and middle- income countries where financial constraints often lead to delayed medical consultation and diagnosis[15]. The study reveals that 94% of patients were parous, with 64% being pre-menopausal. Early age at first pregnancy (≤25 years) was common (75%). Exclusive breastfeeding was practiced by 90%, and 46% used oral contraceptives. Only 6% had a family history of breast cancer, aligning with a prior study showing similar demographic trends. The median duration of symptoms before admission was 9.92 ± 5.13 months, ranging from 2 to 24 months. This aligns with a previous study indicating prolonged symptom duration before diagnosis in these patients, highlighting the need for earlier detection and intervention[16]. The predominant symptom among patients was a breast lump (50.0%), with 98.0% presenting with a palpable breast mass, mirroring previous study[17]. The analysis reveals that 46.0% of patients had T2 tumors (2-5 cm), the most common size at diagnosis. This finding is consistent with previous studies indicating a predominance of medium-sized tumors at presentation. Notably, 28.0% presented with advanced T4 tumors, underscoring the need for earlier detection strategies[18]. Clinical examination revealed that 48.0% of patients had N1 lymph nodes, while per-operative findings showed 30.0% with N1 and a higher detection of N2 lymph nodes (24.0%). This discrepancy highlights the importance of surgical evaluation for accurate nodal staging[19]. Stage distribution revealed 10.0% of cases at Stage I, indicative of localized disease, while Stage II and III accounted for 52.0%, representing locally advanced disease with varying lymph node involvement. Stage IV, indicating metastatic spread, was observed in 4.0% of cases. These findings are consistent with prior studies, emphasizing the importance of early detection for improved outcomes[20]. This study also highlights the distribution of surgical procedures concerning cancer staging, with a notable preference for mastectomy with axillary clearance in advanced stages, mirroring trends observed in previous studies[21]. This study

observed discrepancies between clinical and intraoperative findings, aligning with literature documenting challenges in accurate nodal staging[22]. A potential association was found between the duration of symptoms and the histopathological grade of breast carcinoma. Patients reporting symptoms for six months or more exhibited a notably higher prevalence of moderately and poorly differentiated tumors compared to those with symptoms lasting less than six months, similarly another research indicated that longer symptom duration may correlate with more advanced disease states and higher-grade tumors[23]. In this study patients with well-differentiated tumors often presented with a breast mass or breast pain, while those with moderately and poorly differentiated tumors exhibited more varied presentations, including advanced lesions and axillary masses. These findings emphasize the importance of considering histopathological grade alongside clinical features to tailor management strategies effectively [24]. Poorly differentiated tumors demonstrated a higher prevalence of positive lymph node involvement compared to well-differentiated and moderately differentiated tumors in this study. This finding highlights the aggressive nature of poorly differentiated tumors and highlights the importance of assessing lymph node status in treatment planning[25].

CONCLUSION

This study elucidated the clinico-pathological characteristics of carcinoma breast among female patients in a rural tertiary care hospital, revealing significant insights into the demographic patterns, clinical presentation, and pathological features of the disease in this setting. The findings underscore a predominance of late-stage diagnosis, with many patients presenting with advanced disease, highlighting the need for early detection strategies. Histopathological evaluation indicated that invasive ductal carcinoma was the most common type, and a substantial proportion of tumors were hormone receptor-negative, suggesting more aggressive disease and poorer prognosis. The data also highlighted the role of various risk factors, including age, family history, and lifestyle factors, in the development of breast cancer.

RECOMMENDATION

Given the findings, several recommendations are proposed to improve breast cancer outcomes in rural settings. First, there is an urgent need to implement robust breast cancer screening programs to facilitate early detection, which is critical for improving survival rates. Public health campaigns should be intensified to raise awareness about the importance of early screening, self-examination, and seeking prompt

medical attention for suspicious breast changes. Additionally, healthcare infrastructure should be strengthened to provide accessible and affordable diagnostic and treatment services, including the availability of mammography and biopsy facilities in rural areas. Training programs for healthcare professionals in rural areas should be enhanced to improve their ability to detect and manage breast cancer effectively. Furthermore, considering the high prevalence of hormone receptor-negative tumors, research into tailored treatment options for this subset of patients is necessary. Support services, including psychological counseling and patient support groups, should be established to address the emotional and psychological needs of breast cancer patients and their families. Finally, further large-scale, multicenter studies are recommended to validate these findings and explore additional factors influencing breast cancer characteristics and outcomes in diverse rural populations. These efforts collectively can lead to better management and improved prognosis for breast cancer patients in rural settings.

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