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Demographic and Clinical Profile of Early Breast Cancer Patients: A Study in A Tertiary Care Hospital in Bangladesh

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Abstract
Background: *Examining early-stage breast cancer patients involves analyzing demographic and clinical aspects like age, gender, BMI, and clinical parameters. This is vital for tailoring interventions, predicting prognosis, and guiding decisions in managing early-stage breast cancer.*
Aim of the study: *This study aimed to assess the demographic and clinical profile of early breast cancer patients.*
Methods: *This cross-sectional study was conducted at the Department of General Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from August 2021 to July 2022. In this study, 32 patients with histopathologically core biopsy-proven breast carcinoma, clinically negative for axillary nodes, were purposively enrolled as study subjects. Data analysis was conducted using MS Office tools.*
Results: *The study included breast cancer patients with a mean age of 47.9 ± 10.5 years, and the majority (65.7%) fell within the 38-57 years age group. A significant portion (68.8%) had a body mass index (BMI) >25. Carcinoma was predominantly located on the left side (59.4%), with the upper outer quadrant being the most frequent site (37.5%). Clinically, 71.9% of patients presented with lesions sized between 2.1 and 4.9 cm. Axillary ultrasound (AUS) revealed that half of the patients (16) had no nodes. Suspicious nodes had a statistically significant larger size (1.5 cm) compared to non-suspicious nodes (0.72 cm) (p=0.010).*
Conclusion: *Early breast cancer is more prevalent in middle-aged overweight individuals, with a higher occurrence on the left side. The prevalent lesion size falls within the range of 2.1 to 4.9 cm, and suspicious nodes exhibit a statistically significant larger size compared to non-suspicious nodes.*
Keywords: *Demographic profile, Clinical, Early breast cancer, Carcinoma, Axillary nodal status*

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I. INTRODUCTION

Breast cancer is the most common malignancy affecting women worldwide, second only to cervical carcinoma [1,2]. It is the most frequent cause of cancer death in women in low-middle-income countries like Nigeria (324,000 deaths, 14.3% of total deaths) [3]. The incidence rate varies worldwide, ranging from 27 per 100,000 in central Africa to 96 per 100,000 in Western Europe [4]. Various types of research explore the etiology, socio-demographic patterns, knowledge attitude, and practice of breast examination, along with treatment modalities for managing women with breast cancer [5]. Epidemiological studies have identified various etiological factors for breast cancer, with the disease reported to be rare before the age of 20 [5,6]. Subsequently, the incidence doubles every decade after the age of 30 until menopause. Early clinical diagnosis is pivotal for reducing patient distress and facilitating effective treatment, including surgery, chemotherapy, hormonal therapy, targeted therapy

(e.g., Trastuzumab), radiotherapy, or palliative/supportive care in advanced stages. Timely biopsy of breast lesions is crucial for prompt histopathological assessment to rule out malignancies [6,7]. Axillary nodal status and tumor size emerge as crucial prognostic factors in primary breast cancer, playing a significant role in predicting overall and disease-free survival [8]. The management of axillary nodes for early-stage breast cancer patients is evolving to balance optimal oncologic safety with reduced surgical morbidity [9]. However, preoperative determination of axillary lymph node (ALN) involvement solely by clinical examination remains unreliable, with up to 45% of patients with clinically negative (cN0) axillae exhibiting nodal metastases [10]. Given its impact on prognosis, ALN evaluation is paramount, influencing the development of an effective breast cancer treatment plan [11].

II. METHODOLOGY

This cross-sectional study was conducted at the Department of General Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from August 2021 to July 2022. The study involving 32 patients with histopathologically confirmed breast carcinoma and clinically negative axillary nodes was conducted. Ultrasonographic evaluation categorized patients into axillary lymph nodes (ALNs) and no ALNs groups. The ALNs group underwent ultrasound-guided fine needle aspiration (US-FNA), while the other group underwent sentinel lymph node biopsy (SLNB) and US-FNA for cytology-negative patients. The study received ethical approval from the hospital's committee, and written consent was obtained from all participants before data collection. The study included female patients aged >18 years with histopathologically confirmed primary invasive early breast cancer (T1-3) ipsilateral (cN0). Exclusion criteria comprised patients with a history of previous axillary surgery, recurrent breast cancer, neoadjuvant chemotherapy, bilateral breast cancer, other malignancies, distant metastatic disease, tuberculosis in the breast, mastitis, and upper limb infections or malignant diseases. Data analysis and dissemination were conducted using MS Office tools.

III. RESULT

The mean age of the cases in this study was 47.9 ± 10.5 years, with almost two-thirds (65.7%) belonging to the 38-57 years age group. Additionally, 22 (68.8%) patients had a body mass index (BMI) greater than 25. In terms of clinical presentations, 59.4% of patients had carcinoma on the left side, and the most frequent location was the Upper Outer Quadrant (UOQ) with 12 (37.5%) cases. Clinically, 23 (71.9%) patients had lesions ranging in size from 2.1 to 4.9 cm. According to axillary ultrasound (AUS), half of the patients (16) had no node, while 9 (28.1%) had multiple nodes and 7 (21.9%) had a single node. Axillary ultrasound (AUS) detected axillary lymph nodes in 16 patients. Among them, 6 (37.5%) were identified as suspicious nodes, while 10 (62.5%) were identified as non-suspicious nodes. The size of suspicious nodes was 1.5 (1.1 – 1.7) cm, whereas in non-suspicious nodes, it was 0.72 (.54 - 1.10) cm, showing statistical significance (p=0.010). In our study, 5 patients (83.33%) showed US-FNA positivity with suspicious nodes in axillary ultrasound, whereas 2 (20.0%) were US-FNA positive among 10 patients with non-suspicious nodes in axillary ultrasound. Out of the 25 patients who underwent SLNB, 5 (20.0%) had ≤3 nodes, while 3 (12.0%) had >3 nodes.

Table 1: Baseline characteristics of participants (N=32)

Characteristics	n	%
Age (years)		
28- 37	4	12.50%
38-47	11	34.40%
48-57	10	31.30%
≥ 58	7	21.90%
Mean ± SD (range)	47.9± 10.5 (28.0-70.0)	
Body mass index		
Normal (18.5-24.9)	10	31.30%
Overweight (25.0-29.9)	16	50%
Obese (≥30.0)	6	18.80%

Table 2: Clinical presentation of the respondents

Variable	n	%
Side involvement		
Right	13	40.60%
Left	19	59.40%
Quadrant		
Upper outer	12	37.50%
Upper inner	10	31.30%

Lower outer	5	15.60%
Lower inner	3	9.40%
Central	2	6.30%
Clinical breast lump size		
Up to 2.0 cm	7	21.90%
2.1-4.9 cm	23	71.90%
5.0 cm	2	6.20%

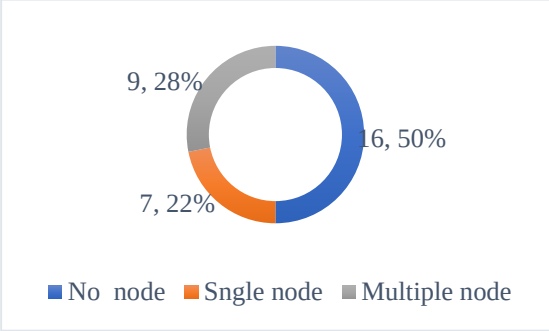

Figure 1: Distribution of patients by number of axillary lymph nodes in axillary ultrasound

Table 3: Axillary nodal characteristics according to axillary ultrasound (AUS) (n=16)

Axillary LN status	Suspicious node	Non-suspicious node	P value
Size, median (IQR)	1.5 (1.1 – 1.7) cm	0.72 (.54 - 1.10)cm	0.01
Frequency (%)	6 (37.5)	10 (62.5)	*NA

IQR=Inter-quartile range, *NA= not applicable

Table 4: Nodal status of the axilla in patients with ultrasound-guided fine needle aspiration cytology (US-FNA) (n=16)

Axillary nodal status	US-FNA positive	US-FNA negative
Suspicious LN in AUS (n=6)	5 (83.33%)	1 (16.67%)
Non-suspicious LN in AUS(n=10)	2 (20.0%)	8 (80.0%)

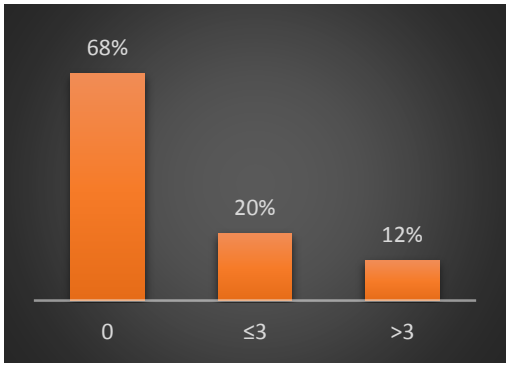

Figure 2: Axillary nodal status among patients who underwent SLNB (n=25)

IV. DISCUSSION

This study aimed to assess the demographic and clinical profile of early breast cancer patients. In this study, the mean age of the patients was 47.9 ± 10.5 years, with two-thirds (65.7%) being between the ages of 38 and 57. Hasan et al. conducted a study and found that the largest population was between the ages of 31 and 50 years, with a mean age of 46.1(SD 12) [12]. According to the GLOBOCON study, the mean age in India was 45 years [13]. The findings of this study were similar to those studies. This study found that 22 (68.8%) patients had a BMI greater than 25. Berclaz et al. revealed that having a higher BMI is associated with a worse prognosis of breast cancer, particularly in premenopausal and perimenopausal women [14]. Another study observed that having a higher BMI (BMI 25.8 kg/m2) was associated with an increase in mortality in premenopausal patients [15]. Left-sided breast carcinoma 19 (59.4%) was more observed than right 13 (40.6%). In Pakistan, Shah et al., [16] discovered that left-sided breast cancer was much more common than right-sided breast cancer. The cause of the increased occurrence of left-sided breast cancer is unknown. Several researchers proposed a possible link with

significantly larger left breast size, diagnostic bias attributable to dominant right-handedness, unilateral lactation, or denser left breast. When compared to other quadrants, the upper outer quadrant (UOQ) had 12 (37.5%) breast carcinomas, 10 (31.3%) upper inner quadrant (UIQ), and 5 (15.6%) lower outer quadrants. Rummel et al. revealed that tumors were more common in the UOQ (51.5%) than the UIQ (15.6%), lower outer quadrant (LOQ, 14.2%), central (10.6%), or lower inner quadrant (LIQ) (8.1%) [17]. The upper outer quadrant was also found to be the most common site of tumors in the Shah et al. study [16] Our findings were consistent with previous research. Clinically, 25 (78.1%) patients had lesions measuring 2.1-4.9 cm in size, while 7 (21.9%) had lesions measuring ≤2cm. A study on Iranian women with breast cancer, >60% of the women had a tumor between 2 cm and 5 cm in size, while approximately 80% of the tumors were larger than 2 cm [16]. AUS was able to detect ALNs in 16 patients among 32. It identified a suspicious node in 6 (37.5%) of the patients and non-suspicious node in 10 patients, and a thick cortex in 2 subjects among 16. The size of the suspicious node was 1.5 (1.1 – 1.7) cm versus 0.72 (.54 - 1.10) cm for the non-suspicious node with statistical significance (p=0.01). A study conducted by Obwegeser et al., [18] found the probability of metastatic involvement 40% of nodes were >20 mm. Alvarez et al. conducted a systematic review in 2006 and revealed that when size criteria were used to identify metastases in patients with nonpalpable axillary nodes, the sensitivity and specificity averaged 60.9 and 75.2%, respectively [19]. With suspicious axillary nodes on AUS and US-FNA positive patients, 7 (21.88%) patients underwent ALND and could spare SLNB. Gipponi et al., [20] observed that 14% of the total population of patients (56/400) could avoid SLNB and undergo immediate ALND. A meta-analysis of 31 studies on US-guided biopsies of ALNs in breast cancer patients by Houssami et al., [21] showed that ALND was done in 19.8% of patients directly. After histopathological evaluation of the cN0 axilla, this study found 6 (18.75%) patients in the pN1 stage and 9 (28.12%) in the pN2-3 stage. In SLNB-positive patients (n=8), 5 patients had pN1 disease and 3 patients had pN2-3 disease with statistical significance (p<0.001). On the other hand, among US-FNA+ (n=7) patients, only 1 (14.29%) had pN1, while 6 (85.7%) had pN2-3 disease. Schipper et al. looked at the nodal disease burden in 40 women with cN0 breast cancer who had an abnormal AUS and a positive lymph node needle biopsy and revealed that 25 (62.5%) had pN1 disease, while 15 (37.5%) had pN2-3 disease on final histopathology [22].

Limitation of the study:

The study's limitations include a small, non-representative sample size, operator-dependent procedures, and a focus on a single hospital in Dhaka city. These factors may restrict the generalizability of results to the entire population of Bangladesh.

V. CONCLUSION & RECOMMENDATION

This study sheds light on key patterns and characteristics within the cohort of early breast cancer patients. The higher prevalence observed in a middle-aged overweight population underscores the relevance of considering demographic factors in breast cancer screenings and interventions. Notably, the elevated occurrence of early breast cancer on the left side and the range in prevalent lesion size from 2.1 to 4.9 cm emphasize the intricacies of tumor localization and sizing. Moreover, the statistically significant larger size of suspicious nodes compared to non-suspicious nodes highlights the potential utility of nodal assessment in predicting disease severity. These nuanced insights contribute valuable information to the understanding of early breast cancer demographics and presentation, informing future diagnostic and therapeutic strategies for this patient population.

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