

Survival of early-stage breast cancer: a study in a tertiary care hospital in Bangladesh

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Abstract

Background: Breast cancer is the most frequent cancer in women worldwide, posing a significant health burden. Breast cancer survival outcome are improving in affluent countries, but remain low in impoverished countries. There is less research in Bangladesh on the survival rates of people with early-stage breast cancer.

Aim of the study: The goal of this study was to assess the survival outcome of female patients with early-stage breast cancer.

Methods: The current study was a hospital-based prospective observational study. This study was carried out at Delta Medical College & Hospital, Dhaka, Bangladesh between January 2013 to January 2023. The study subjects consisted of 145 female patients with early-stage (Stages I-IIIa) breast cancer who met the inclusion and exclusion criteria. All collected data was analyzed descriptively using SPSS 11.5.

Results: The majority of the participants ranged in age from 31 to 40. The total survival rate was determined to be 79.31% (N=115). At the time, the mortality rate was 20.69%. Among the 115 patients who survived, 85% were above the age of 40, with the remaining 15% being 40 or younger. Patients with tumor stages I, II, and III had higher 10-year overall survival rates (52.10%, 35.40%, and 12.50%, respectively). We found that tumor grade-wise 10-year overall survival rates were 27%, 61%, and 12% for tumor grade I, II, and III patients, respectively (115 survivors). Among the 115 surviving patients, 51.40% had positive node status, whereas 35.20% had negative node status, and information on the other patients' node status was absent.

Conclusion: Early detection and treatment of breast cancer significantly improves survival rates. The study concluded that early detection and extensive screening are crucial for improving survival rates for breast cancer.

Keywords: Early-stage breast cancer, Survival, Outcome, Health burden.

I. INTRODUCTION

Breast cancer is the most frequent cancer among women globally, posing a significant health cost. Cancer is a leading cause of death in women globally, accounting for nearly 1 million of the estimated 10 million neoplasms diagnosed annually [1]. The prevalence in industrialized nations, such as the United States and the United Kingdom, is substantially higher, ranging between 50 and 100 per 100,000 people [2], accounting for around 375 000 deaths in the United States in 2000 [3]. Breast cancer death rates have decreased in North America, Europe, and Australasia during the 1990s. Mammographic screening, therapeutic advances, and healthcare system efficiency have all contributed to the drop in cases [4,5]. Breast cancer patients now have a considerably better long-term prognosis than 50 years ago. In Spain, estimated 10-year survival rates exceed 80% [6]. This progress could be summarized by the combination of earlier diagnosis and the developments with superior treatments [7]. In developing countries like India, 5-year survival rates are roughly 77%, comparable to Latin American countries like Puerto Rico (71.2%). Breast cancer hospital-based survival studies in southern and southeastern Brazil found higher 5-year survival rates, ranging from 75% in Rio de Janeiro, RJ to 87.7% in Santa Maria, RS [8,9]. In a Brazilian study, prognostic factors such as age (<50 vs >50), tumor size (T2-3 vs T1), stage (III-IV vs I-II), number of nodes, immunohistochemical markers (HER-2, ER, PR receptors, and p53), and treatment (surgery, radiation, immunotherapy, chemotherapy, and combinations thereof) were found to be statistically associated with breast cancer survival [10]. This study aimed to assess female patients with early-stage breast cancer and their survival outcome.

II. METHODOLOGY

The current study was a prospective observational study carried out in a hospital. This study was conducted at Delta Medical College & Hospital in Dhaka, Bangladesh, from January 2013 to January 2023. The study included 145 female patients with early-stage (Stages I–III A) breast cancer who met the inclusion and exclusion criteria. Inclusion criteria: Patients over 18 years old, tumor stages I to III A, and HPR-duct cell carcinoma. Exclusion criteria; Patients with age <18 years and >70 years, tumor stage IV, patients with serious illnesses (Diabetes mellitus and hypertension) and if not given consent were excluded from the study. All collected data was analyzed descriptively using SPSS 11.5.

III. RESULT

The study included 145 people, all of whom had duct cell carcinoma based on exclusion and inclusion criteria. The majority of the participants ranged in age from 31 to 40 [Table-1]. The majority of the participants had a stage II tumor, which was observed in 48.97% of them. The remaining 33.10% and 17.93% of individuals had stage I and III cancer receptors, respectively [Table-2]. In this investigation, we discovered that most of the patients had grade 1 cancer [Table-3]. N1 node status was detected in 56.55% of patients. The remaining 17.24% of participants had N2 status, whilst 26.21% had N0 status [Table-4]. Finally, at the follow-up, the total survival rate was determined to be 79.31% (N=115). At the time, the mortality rate was 20.69% [Figure 1]. Among the 115 patients who survived, 85% were above the age of 40, with the remaining 15% being 40 or younger [Figure 2]. The study indicated that patients with tumor stages I, II, and III had higher 10-year overall survival rates (52.10%, 35.40%, and 12.50%, respectively) [Figure 3]. In this study, we found that tumor grade-wise 10-year overall survival rates were 27%, 61%, and 12% for tumor grade I, II, and III patients, respectively (115 survivors) [Figure 4]. Among the 115 surviving patients, 51.40% had positive node status, whereas 35.20% had negative node status, and information on the other patients' node status was absent [Figure 5].

Table -1: Age range of the participants (N=145)

Age Range (years)	Frequency	Percent
21-30	27	18.62
31-40	58	40.00
41-50	46	31.72
51-60	12	8.28
>60	2	1.38
Total	145	100
Mean ± SD	42.75 ± 9.89	

Table-2: Tumor stage of the participants (N=145)

Tumor stage	Frequency	Percent
Stage I	48	33.10
Stage II	71	48.97
Stage III	26	17.93
Total	145	100

Table-3: Tumor grade of the participants (N=145)

Tumor grade	Frequency	Percent
Grade 1	79	54.48
Grade 1	38	26.21
Grade 1	28	19.31
Total	145	100

Table-4: Node status of the participants (N=145)

Node status	Frequency	Percent
N0	38	26.21
N1	82	56.55
N2	25	17.24
Total	145	100

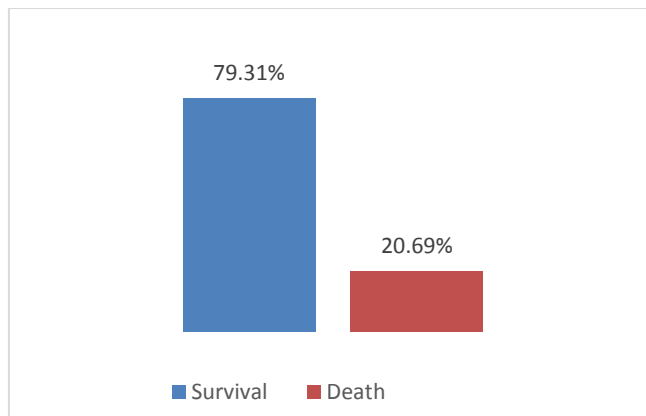


Figure 1: Survival among the participants (N=145).

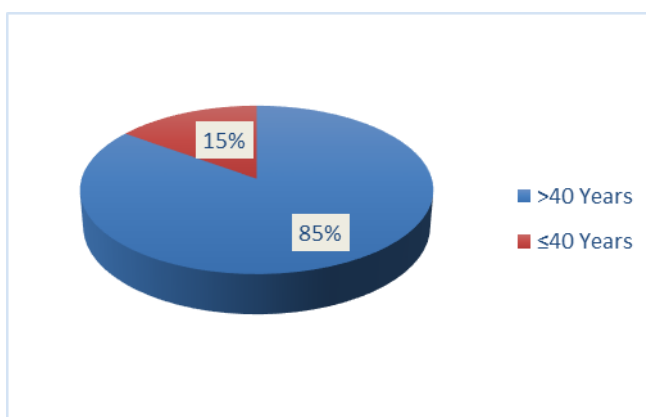


Figure 2: Age distribution of surviving participants (N=115).

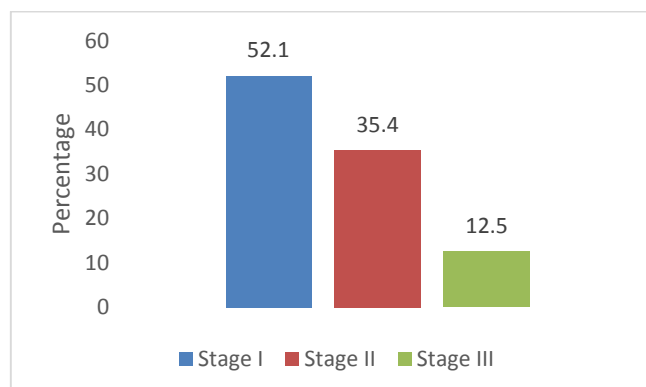


Figure 3: Tumor stage of the surviving participants (N=115)

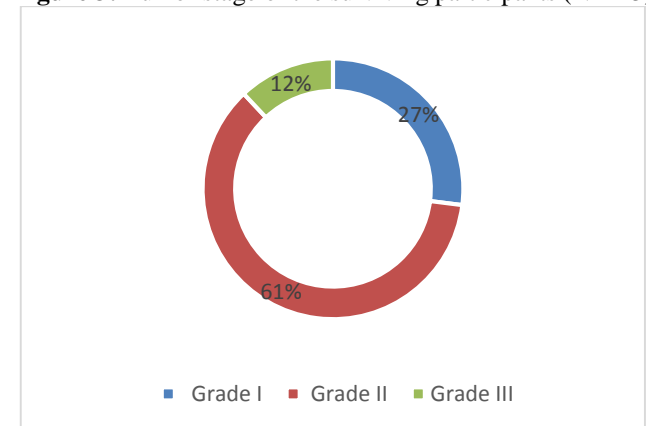


Figure 4: Tumor grade of the surviving participants (N=115)

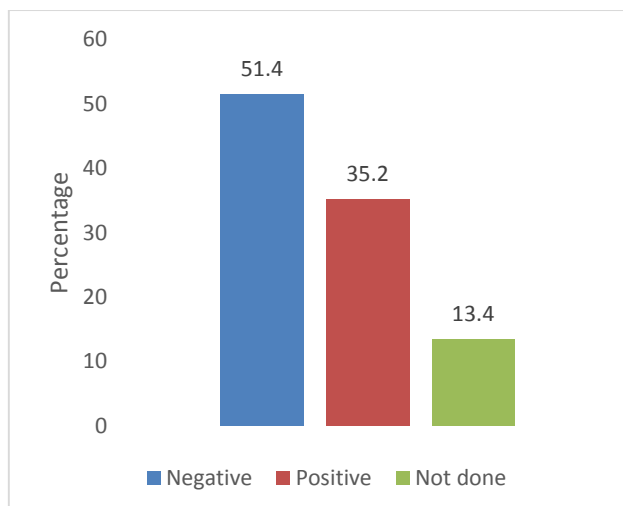


Figure 5: Nodal receptor status of the surviving participants (N=115)

IV. DISCUSSION

This study aimed to assess the survival rate of female patients with early-stage breast cancer (Stages I-III A) based on their age, tumor stage, tumor grade, and node status. In our study, all of the participants were duct cell carcinoma patients by selection. The current study found a 10-year breast cancer-specific survival rate. The rate of 79.31% (N=115) was comparable to that seen in other European nations such as Spain (>80%). Higher than in other developing countries, such as India (77%), and Puerto Rico (71.2%) [6,11,12]. Our study indicated a survival rate of 79.31%, comparable to that of Santa Maria, SC, and higher than Belo Horizonte (78.5%), Barretos (74.8%), and Florianópolis (76.2%) [9,10,13,14]. The study indicated that most breast cancer cases were diagnosed in the early stages (I-III A), similar to rates in affluent countries and Brazil's more developed districts [14]. Our investigation found that 48.97% of participants had stage II cancer. Approximately 33.10% and 17.93% of individuals had stage I and III cancer, respectively. Research indicates that late-stage diagnosis correlates with decreased global survival rates [14,15]. The study found that 85% of the 115 patients who survived were over 40 years old, whereas 15% were 40 years or younger. Breast cancer in women under 40 is uncommon, accounting for only 7% of all cases. It is often associated with a worse prognosis than in women over 40 [16]. Some studies suggest that younger women with early-stage disease may have a different prognosis [17]. Although breast-conserving surgery is the preferred treatment for early-stage breast cancer, the significance of surgical margins remains unclear and contested [18,19].

Limitation of the study:

This study was a single-center study with a small sample size, so these findings may not reflect the actual scenario.

V. CONCLUSION & RECOMMENDATION

Early detection and treatment of breast cancer significantly improves survival rates. The study concluded that early detection and extensive screening are crucial for improving survival rates for breast cancer. To obtain more detailed conclusions, we recommend doing additional studies with greater sample sizes in multiple locations.

References

- [1]. Ferlay J, Bray F, Pisani P, Parkin DM (2001) Cancer Incidence, Mortality and Prevalence Worldwide GLOBOCAN 2000 IARC CancerBase No. 5 [10]. IARC: Lyon, France.
- [2]. Althuis MD, Dozier JM, Anderson WF, Devesa SS, Brinton LA (2005) Global trends in breast cancer incidence and mortality 1973 – 1997. *Int J Epidemiol* 34(2): 405 – 412.
- [3]. Bray F, McCarron P, Parkin MD (2004) The changing global patterns of female breast cancer incidence and mortality. *Breast Cancer Res* 6: 229 – 239.
- [4]. Hery C, Ferlay J, Boniol M, Autier P. Quantification of changes in breast cancer incidence and mortality since 1990 in 35 countries with Caucasian-majority populations. *Ann Oncol*. 2008;19(6):1187-94.
- [5]. Autier P, Hery C, Haukka J, Boniol M, Byrnes G. Advanced breast cancer and breast cancer mortality in randomized controlled trials on mammography screening. *JCO*. 2009;27(35):5919-23.
- [6]. Macià F, Porta M, Murta-Nascimento C, Servitja S, Guxens M, Burón A et al. Factors affecting 5- and 10- year survival of women with breast cancer: an analysis based on a public general hospital in Barcelona. *Cancer Epidemiol*. 2012;36(6):554-9.
- [7]. Peto R, Early Breast Cancer Trialists' Collaborative Group. The worldwide overview: new results for systemic adjuvant therapies. In: San Antonio breast cancer symposium. 2007;13-6.
- [8]. Mendonça GAS, Silva AM, Caula WM. Tumor characteristics and five-year survival in breast cancer patients at the National Cancer Institute, Rio de Janeiro, Brazil. *Cad Saude Publica*. 2004;20(5):1232-9.

- [9]. Moraes AB, Zanini RR, Turchiello MS, Riboldi J, Me-deiros RL. Survival study of breast cancer patients treated at the hospital of the Federal University in Santa Maria, Rio Grande do Sul, Brazil. *Cad Saude Publica*. 2006;22(10):2219-28.
- [10]. Schneider IJC, D'Orsi E. Five-year survival and prognostic factors in women with breast cancer in Santa Catarina State, Brazil. *Cad Saude Publica*. 2009;25(6):1285-96.
- [11]. Ganesh B, Talole SD, Dikshit R, Badwe RA, Dinshaw KA. Estimation of survival rates of breast cancer patients - a hospital-based study from Mumbai. *Asian Pac J Cancer Prev*. 2008;9(1):53-7.
- [12]. Ortiz AP, Frías O, Pérez J, Cabanillas F, Martínez L, Sánchez C et al. Breast cancer molecular subtypes and survival in a hospital-based sample in Puerto Rico. *Cancer Med*. 2013;2(3):343-50.
- [13]. Hosmer DW, Lemeshow S, May S. *Applied survival analysis: regression modelling of time-to-event data*. 2nd ed. Hoboken: John Wiley and Sons. 2008.
- [14]. Carnesecca EC, Mauad EC, Araujo MAA, Dalbó RM, Longatto Filho A, Vazquez VL. The Hospital de Cancer de Barretos Registry: an analysis of cancer survival at a single institution in Brazil over a 10-year period. *BMC Res Notes*. 2013;6:141.
- [15]. Höfelmann DA, Anjos JC, Ayala AL. Survival for ten years and prognostic factors for women with breast cancer in Joinville in the State of Santa Catarina, Brazil. *Cien Saude Colet*. 2014;19(6):1813-24.
- [16]. Hayes DF. Clinical practice. Follow-up of patients with early breast cancer. *New Engl J Med*. 2007;356(24):2505-13.
- [17]. Sundquist M, Thorstenson S, Brudin L, Wingren S, Nordenskjöld B. Incidence and prognosis in early onset breast cancer. *Breast* 2002; 11(1):30-35.
- [18]. Behm EC, Beckmann KR, Dahlstrom JE, Zhang Y, Cho C, Stuart-Harris R et al. Surgical margins and risk of locoregional recurrence in invasive breast cancer: an analysis of 10-year data from the breast cancer treatment quality assurance project. *Breast*. 2013;22(5):839-44.
- [19]. Ishida T, Takeda M, Suzuki A, Amari M, Moriya T, Ohuchi N. Significance of irradiation in breast-conserving treatment: comparison of local recurrence rates in irradiated and nonirradiated groups. *Int J Clin Oncol*. 2008;13(1):12-7.