

Survival rates among breast cancer patients from a Hospital-Based Cancer Registry, Thrissur, and Kerala, India

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Abstract

Introduction: Breast cancer is a biologically heterogeneous disease and patients with the same diagnostic and clinical prognostic profiles can have markedly different clinical outcomes. This difference is possibly caused by the limitation of our current taxonomy of breast cancers, which groups molecularly distinct diseases into clinical classes based mainly on morphology.

Objectives: The study objective was to assess the survival rates of breast cancer patients of all immunohistochemical subtypes at a hospital-based cancer registry, Thrissur, Kerala.

Methodology: After obtaining Institutional Ethical Clearance we included 202 patients of histologically diagnosed breast carcinoma who had been diagnosed in the year 2016. Data was obtained from the patient files. Associations between tumor subtypes and survival rates were examined.

Results: Of the 202 patients, 197 were females and 3 were males. The mean age of the study population was 55.9±11.8 years. The survival rate at three years was 76.5%.

Conclusions: It was found that the survival rate at three years for the study population was 76.5%. Community-based surveys will give a better outlook regarding the survival rates in the general population. More studies from developing countries like India are appreciated to understand the burden of disease.

INTRODUCTION

Breast cancer is a biologically heterogeneous disease. The difference in disease progression and outcome of therapy can be attributed to its heterogeneity¹. A decline in mortality rates has been observed in breast cancer patients in recent decades and this decline

has been attributed to widespread mammography screening, systemic therapy, and adjuvant endocrine therapy².

Breast cancer patients with tumors that are (ER)-positive and/or (PR)-positive have greater survival advantage after diagnosis than (ER)-negative and/or (PR)-negative disease and the survival advantage is enhanced by treatment with adjuvant hormonal and/or chemotherapeutic regimens^{3,4}. HR-negative tumors are more likely to be poorly differentiated, of higher histological grade, associated with a higher recurrence rate and a decreased overall survival and unresponsive to antioestrogens⁵. A widely accepted multidisciplinary approach to the management of breast cancer involves surgery, chemotherapy, radiotherapy, and hormonal therapy, and higher rates of these treatments taken together are likely to characterize services working efficiently and associated improved survival rates⁶.

Survival is a key index of the overall effectiveness of health services in the management of patients with cancer and survival patterns can be used to drive national cancer strategies, as have been used across several nations in the world⁷. The objective of this study was to assess the survival rates of breast cancer patients of all immunohistochemical subtypes at a hospital-based cancer registry, Thrissur, Kerala.

METHODOLOGY

2.1. Study Design

A retrospective cohort study was designed to collect data.

2.2. Study Setting

Hospital-Based Cancer Registry in Kerala, South India.

2.2.1. Study Population

Breast Cancer patients from hospital-based cancer registry centre in Kerala, South India whose IHC has been done in the year 2016. All cases in the cancer registry were identified by the coding system of the International Classification of Diseases for Oncology,

3rd Revision (ICD-03), from the World Health Organization.⁸ To confirm the diagnosis of breast cancer and examine the changes in coding, we retrospectively collected and checked records of diagnosis and pathological reports of these cases.

2.2.2. Data Collection

A total of 202 cases of invasive breast cancer had been recorded in the IHC register during the year 2016 and were included in the study. Prior permission was obtained from the management of the institution to collect the required data from the patient data file. Permission was also taken from the Head of the Department of Pathology to access the data from the department register. The following variables were recorded at baseline for each patient including age, menopausal status, tumor grade, histological subtype, tumor size, nodal status, and metastatic involvement at presentation. Hormone receptor status including Estrogen receptor (ER), Progesterone receptor (PR), and Her-2 positivity was also documented. Type of surgery, chemotherapy received, be it neo-adjuvant, adjuvant or palliative, types of radiation received were also recorded. The development of locally recurrent disease and sites of distant metastasis was documented. In case if the data was not available, it was recorded as data not available. The observations were coded as numbers.

Estrogen receptor (ER), and progesterone receptor (PR) were defined according to Allred scoring as positive when the sum of proportion and intensity was two and above.⁹ Her-2 positivity was defined as more than 10% strong complete membrane staining or positive with fluorescent in situ hybridization technique (FISH).¹⁰

2.2.3. Data Analysis

The data were entered in Microsoft Excel and analyzed using SPSS version 23.0. Mean and standard deviation was computed for continuous variables and proportions were reported for categorical variables. The purpose of the analysis was to report overall survival at three years. A P-value of less than 0.05 was considered as statistically significant. The Log-rank test was assessed and Cox Proportional hazard ratios were computed to assess associations between survival and independent variables. The independent variables were menopausal status, tumor size, tumor grade, ER, PR, and Her 2 neu status, nodal involvement, and disease stage. By applying the non-parametric Kaplan-Meier survival curve technique, we estimated the overall survival rate.

RESULTS

The hospital records containing IHC reports and biopsy report of 202 breast cancer patients who presented to this hospital in the year 2016 was obtained, which included representation from 10 districts of Kerala, India. The mean age of the study population was 55.9 with a standard deviation of 11.84. The majority were in the age group 46-55 (32.7%). 199 cases in our study were females (98.5%) and 3 were males (1.5%). 191 (94.6%) of the cases were invasive breast carcinoma and regarding the nodal status 115 (56.9%) were node-negative and 85 (42.1%) were node-positive. 188 (93.1%) of the cases were multiparous and 11 (5.4%) were nulliparous. Regarding the menopausal status, 137 (67.8%) of the cases were

post-menopausal and 59 (29.2%) were pre-menopausal. The receptor status proportion is nearly equally distributed among cases. ER, PR and Her-2 status of the study population are depicted in Table 1. The survival rate according to the immunohistochemical subtype has been assessed but found to have no statistical significance.

The proportion of cases receiving different modalities of treatment combinations, such as surgery, chemotherapy, radiation, and hormonal therapy is given in Table 2. Figure 1 shows the mean survival of total cases at three years which is 76.5% and Figure 2 shows the mean survival of cases depending on the combination of treatment undergone, in which cases underwent surgery along with chemotherapy, radiation, and hormonal therapy has better survival when compared to the combination of other modalities.

Table 1. Receptor status of the study population.

Receptor status	Positive	Negative	Equivocal
ER	120(59.4%)	80(39.6%)	-
PR	95(47%)	103(51%)	2(1%)
HeR-2	71(35.1%)	100(49.5%)	24(11.9)

Table 2. Log-rank test to assess the proportional hazard assumptions

Number of treatment modalities	mean	Std. Error	95% confidence interval		P-value
			Lower bound	Upper bound	
1	49.242	.547	36.026	45.261	0.023
2	48.786	.885	48.169	50.315	
3	47.628	.368	47.052	50.520	
4	49.051	.527	46.907	48.349	

- 1- Patients have undergone only surgery.
- 2- Patients who have undergone surgery and chemotherapy
- 3- Patients who have undergone surgery and chemoradiation
- 4- Patients who have undergone surgery, chemoradiation and hormonal therapy

Figure 1. Patient status with a mean survival

Figure 2. Mean survival based on the combination of treatment modality underwent.

DISCUSSION

In women, breast cancer is the most frequently diagnosed malignancy and the leading cause of cancer death in both developed and developing countries¹¹. The stage at diagnosis in our study is

late when compared to developed countries and previous studies from India show the same¹².

Regarding survival in breast cancer cases mean and cumulative survival is lower in cases who underwent only surgery and it is better and higher in the case who had completed other treatment modalities along with surgery. Previous studies have shown combining surgery with chemoradiation and hormonal therapy has greatly improved the survival rate¹³. A large population-based study shows that there is a greater negative effect at a young age, among those not receiving adjuvant treatment and age, did not have any significant effect¹⁴. The survival rate of our study is 76.5% which is comparable to the study conducted by Vettuparambil et al¹⁵ in Kerala (71.4%) and Raina et al in New Delhi (73%).¹⁶

The mean survival rate of our study population was 76.5% at three years. In our study, we found that the stage of cancer at diagnosis is late which can be attributed to lesser screening practices and awareness among our study population. In our study, it was highlighted that cases who underwent other modalities of treatment in addition to surgery had better survival than cases who underwent only surgery. In the study population, 147(72.8%) were diagnosed in grade 2.

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Figure 1. Patient status with mean survival

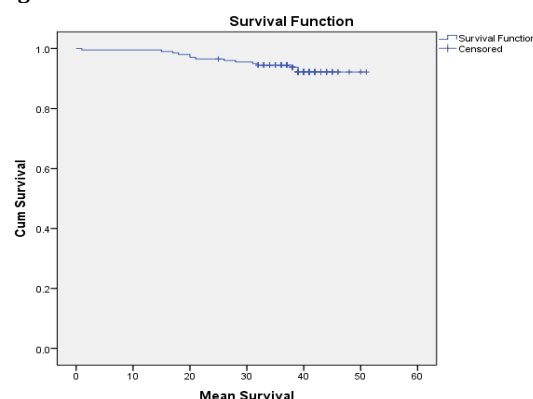
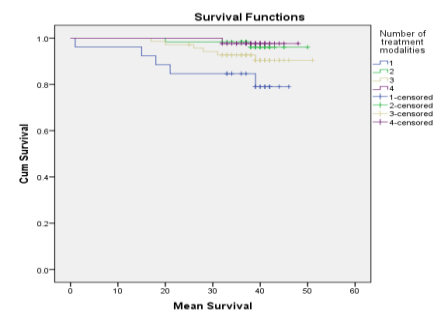


Figure 2. Mean survival based on the combination of treatment modality underwent.



Patients have undergone only surgery. Patients who have underwent surgery and chemotherapy. Patients who have underwent surgery and chemo radiation. Patients who have underwent surgery, chemo radiation and hormonal therapy