


Epidemiological Trends of Breast Cancer in Southern Ethiopia: A Seven-Year Retrospective Review

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Abstract

Introduction: African women are affected by cancer at an early age of their productivity. However, the exact prevalence and incidence of cancer, including breast cancer is not known in most sub-Saharan African countries, including Ethiopia because of lack of well-established cancer registry. This study aims to assess the epidemiology of breast cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH), the biggest referral hospital with cancer treatment center serving the southern part of the country.

Methods: Retrospective review of charts of all patients with a diagnosis of breast cancer between 2013 and 2019 at HUCSH was conducted. A standardized questionnaire was used to collect relevant data that include sociodemographic, symptoms, type of diagnosis, treatment, and outcomes. Data were entered using epidata version 3.1 and analyzed using MS Excel and SPSS version 20.

Results: Five hundred fifty-nine (18.6%) breast cancer cases were retrieved in 7 years between 2013 and 2019. Of this, 548 (98%) were women. The median ages of the patients were 38 years. Invasive ductal carcinoma was the leading 309 (55.3%) histologic type followed by 185 (33.1%) lobular carcinoma. One hundred seventy-seven (31.7%) were moderately differentiated and 155 (27.7%) were poorly differentiated. Three hundred seventy-two (66.5%) were advanced breast cancer (Stages III and IV). Trends of breast cancer showed the case load is continuously increasing except with a slight reduction of cases in between 2015 and 2016. The majority were advanced breast cancer occurring at an early age by the time diagnosis made. Invasive ductal carcinomas were the predominant one. The trend also showed a continuous increment of cancer case load. Therefore, cancer registration center establishment, community awareness creation, and intensive early detection strategy are mandatory.

Keywords

breast cancer, Hawassa, Southern Ethiopia

Introduction

The epidemiologic trend of cancer diseases is globally increasing over time.^{1,2} African women are primarily affected by cancer at an early age of their productivity.^{3,4} Breast cancers is one of the leading cancers among women in developing countries including Ethiopia.⁵⁻⁸ It is one of the major causes of morbidity and mortality in developing countries.¹ Breast cancer affects the quality of women's health at younger ages and aggravates the deep rooted economic problem of women in low income country including Ethiopia.^{9,10}

Globally, more than two million women are affected by breast cancer each year. Around one third of these women die

of whom three fifth are from low income countries. The exact prevalence and incidence of cancer, including breast cancer is not known sub-Saharan Africa, including Ethiopia because of

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lack of well-established cancer registry.¹¹ However, some hospital based studies showed that the prevalence of breast cancer ranges from 18.3 to 33% of all diagnosed cancer cases.^{12,13}

There are limited studies done to describe epidemiology of breast cancer in southern Ethiopia. Therefore, the aim of this study was to assess the epidemiology of breast cancer at Hawassa University Comprehensive Specialized Hospital (HUCSH).

Methods and Materials

Study Place and Setting

This study was conducted at Hawassa University Comprehensive Specialized Hospital (HUCSH) in Hawassa city. This hospital is a government-owned, specialized hospital in Southern Nation Nationalities People Region (SNNPR). The hospital serves for more than 18 million people from the SNNPR, Oromia region, and other regions. The hospital recently established an oncology department in 2013, which is staffed by senior oncologist, general practitioners, nurses and supportive staffs. The department has outpatient clinics and inpatient services patients with solid tumors. This hospital is the only hospital serving as cancer treatment and diagnostic center in the southern part of Ethiopia. Currently the hospital provides chemotherapy and hormonal treatments. Expansions to start radiotherapy services in the near future are ongoing. The oncology unit receives patients referred from surrounding health centers, primary and general hospitals.

Diagnosis of cancer is done mainly using tissue biopsy. There is a well-equipped pathology unit providing this service. Staging, prognostication and treatment decision is made by the cancer team, which is led by the oncologist. All patients with cancer seen at the cancer unit (clinics and wards) of the hospital are registered in the unit's dedicated registration book which includes their name, age, sex, hospital number, data of the visit diagnosis/type of cancer and place of residence.

Study Design

Retrospective hospital-based patient chart record analysis of patients diagnosed with cancer between January 2013 and January 2019.

Data and Data Collection

The oncology unit registration book was used to identify patients with diagnosis of breast cancer during the study period. Using the hospital number from the registration book, their hospital charts were retrieved. The hospital chart which is normally kept in the hospital patient archive rooms contains the details of the patient information, physician's history and physical examination, the lab. results, treatment decisions, medications, and treatment outcomes.

Relevant data were extracted from the charts using data collection tool designed to collect uniform data from the patients' charts for this study. The collected data included sociodemographic, clinical manifestations, diagnosis, and type of cancer, stage, treatment, and outcomes.

Data Entry and Analysis

Data were entered using epidata version 3.1 and analyzed using MS Excel and SPSS version 20. Descriptive analysis was shown the frequencies and percentages. Medians and interquartile ranges were calculated. The data were illustrated with tables and graphs.

Result

Over a period of 7 years, January 2013–January 2019, there were 3002 new patients with cancer registered in the oncology unit of HUCSH. Of which five hundred fifty-nine (18.6%) were patients with breast cancer. Of this, 548 (98%) were women. The median ages of the patients were 38 (IQR: x1–x3) years. The peak age of incidence of breast cancer in this study was between 3rd and 5th decades (30–49 years) which accounts 321 (57.4%) of all cases. [Figure 1](#).

The geographic distribution of breast cancer patients was 327 (59%) from SNNPR and 217 (39%) from Oromia region and the remaining 5 (2%) from other regions. The majority of the patients were from Hawassa town, 131 (23.4%) followed by 91 (16.3%) from the Sidama zone in SNNPR; 130 (23.2%) from West Arsi, and 34 (6%) from Guji zones in the Oromia region. [Figures 2 and 3](#) and [map 1](#).

The tumor site was in the left breast in 302 (54%) and in the right in 218 (39%) of the patients. The median duration of first symptoms to diagnosis was 12 months. Diagnosis was made by fine needle aspiration cytology (FNAC) in 335 (60%) of patients and by biopsy in 212 (37.9%). Invasive ductal carcinoma was the leading 309 (55.3%) histologic type followed by 185 (33.1%) lobular carcinoma. With regards to staging, 372 (66.5%) had advanced breast cancer (Stages III and IV) at the time of diagnosis. The pathology results showed moderately differentiated in 177 (31.7) and poorly differentiated histology type in 155 (27.7%). [Table 1](#). The post-surgery pathological stage for those who underwent surgery were 16 (8.2%) Stage I, 63 (32.1%) Stage II, and 117 (59.7%) Stage III.

As [Figure 4](#) shows, the trends of breast cancer in the hospital are increasing over the years. There was a slight reduction of cases in 2015 and 2016. In the first year of the hospital establishment that was in 2013 only 69 (12.3%) case were seen then yearly the caseloads were increased and in 2019 106 (19%) cases were diagnosed and treated in the hospital.

All patients with stage I- to stage III took chemotherapy drugs which were doxorubicin, cyclophosphamide and paclitaxel every 3 weeks for 8 cycles and for stage IV doxorubicin and cyclophosphamide every 3 weeks for 6 cycles. Hormonal

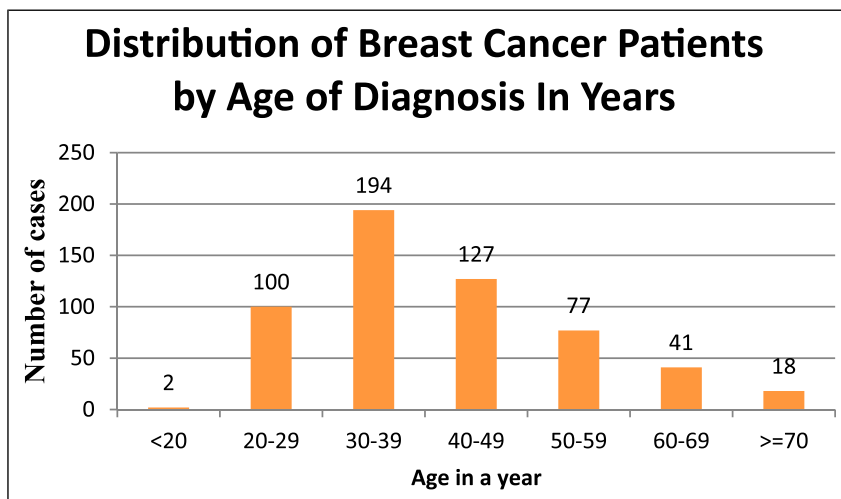


Figure 1. Distribution of breast cancer by age of the patients in years between 2013 and 2019.

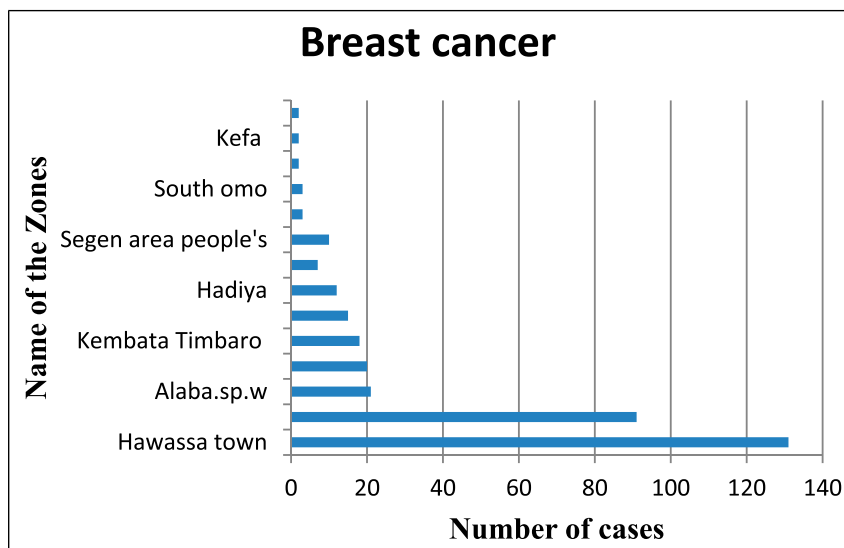


Figure 2. Geographical distribution of breast cancer patients who treated in HUCSH by zones and special Woredas of SNNPR between 2013 and 2019.

therapy, for those premenopausal women and men were taken tamoxifen 20 mg PO per day and for those patients who were post-menopausal received anastrozole 1 mg PO/day after chemotherapy. 363 (65%) of the cases were treated with chemotherapy alone, 112 (20%) patients were underwent modified radical mastectomy (MRM) surgery and chemotherapy, and the remaining 84 (15%) surgery plus chemotherapy and hormonal therapy. [Table2](#).

Although we do not know about the patient’s condition because there is no well-coordinated referral system, nearly half (274) of the patients were referred for radiotherapy treatment at a Tikur Anbessa specialized hospital in the capital city of Ethiopia. During the primary treatment, nearly 65% of the patients showed partial response and stable disease.

Discussion

Breast cancer accounted for close of the one-fifth of the hospital cancer burden. The study showed that patients come on average after one year of symptoms with advanced stage of disease (Stages III and IV). Most affected are women of age group 30–50 years and a common site of tumor is left breast, invasive ductal carcinoma being the predominant histology type.

Moderately differentiated were the common types of tumor behavior. The trend showed that the case burden of breast cancer is continuously increasing.

This study revealed that breast cancer case burden accounts to 18.62%, which was the leading from all cancer types registered at HUCSH. This finding is in line with studies done

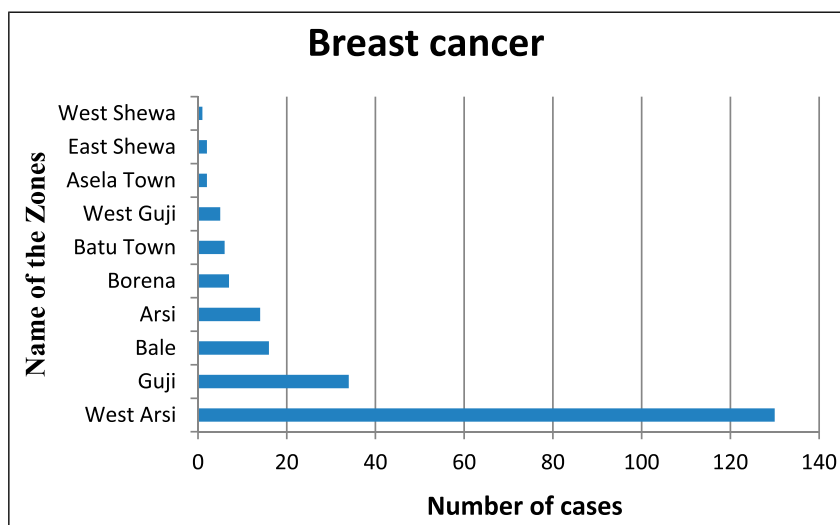


Figure 3. Geographical distribution of breast cancer patients who treated in HUCSH by zones and special Woredas (Districts) from the Oromia region between 2013 and 2019.

Table 1. Characteristics, Histopathological Subtypes, Tumor Behavior, Stage, and Histological Grade of BC Among Study Participants Between 2013 and 2019.

Variable	Count	Percent
Site	Left breast	302 54
	Right breast	218 39
	Both	39 7
Duration of symptoms	1–6 months	283 50.6
	7–12 months	114 20.4
	13–23 months	128 22.9
	≥24 months	34 6.1
Means of diagnosis	FNAC	335 60
	Biopsy	212 37.9
	Unknown	12 2.1
Histologic types	Invasive ductal carcinoma	309 55.3
	Lobular	185 33.1
	Papillary	34 6.1
	Mixed	23 4.1
	Not stated	8 1.4
Clinical Stage	Stage I	21 3.8
	Stage II	82 14.7
	Stage III	192 34.3
	Stage IV	180 32.2
	Not stated	84 15
Tumor behavior	Well-differentiated	76 13.6
	Moderately differentiated	177 31.7
	Poorly differentiated	155 27.7
	Undifferentiated	42 7.5
	Not stated	109 19.5

in Tikur Anbessa specialized hospital (TASH) 18.3%¹² and lower than studies done in Saint Paulos hospital 29.3% and from population-based cancer registry in Addis Ababa and other 6 regions of the country 33%.^{14,15} The difference might be Saint Paulo's hospital is primarily established for breast cancer

treatment and our finding might be representative of the few women who are capable of reaching care at a regional cancer center. The majority of the patients were at the age between 3rd and 5th decades. This is consistent with studies done in Tikur Anbessa specialized hospital (TASH) and University of Gondar Hospital cancer center and India.^{6,13,16,17} This might be the majority of the population demography is young, who afford the health care cost unlike the old population.

Left breast was the most common site of cancer lesion. The finding is in line with studies done in central Africa and America. Excessive risk of developing cancer lesion remains on the left side. The possible reason for this is not yet clear.^{18,19}

FNAC was the dominant means of diagnosis of breast cancer; this finding was in line with the study done in Jimma.²⁰ This could be the technique is easy and affordable. The presentation of a breast lump is also accessible for FNAC procedure.

Majority of the cases were diagnosed late at Stages III and IV. This finding is similar to studies done in 3 hospitals in Addis Ababa, University of Gondar Hospital cancer center, central Africa, and India.^{5,16,17} Most African women were presenting hospital at late stage of the diseases. This is might be because of undermining symptoms, lack of treatment seeking behavior, lack of awareness of the community about the diseases, being afraid and not wanting to know, poor health care system, no routine screening program of breast cancer, shortage of oncology health care services and oncology professionals in the country, and economic challenge of the population to access the services.²¹ In addition, it is also due to lack of population-based screening program in the community.

The trends of breast cancer showed a continuous increment of in case load. This is in line with studies done in TASH and Saint Paulo's hospital^{6,14} This could be as the result of expansion of the treatment center and oncology professionals.

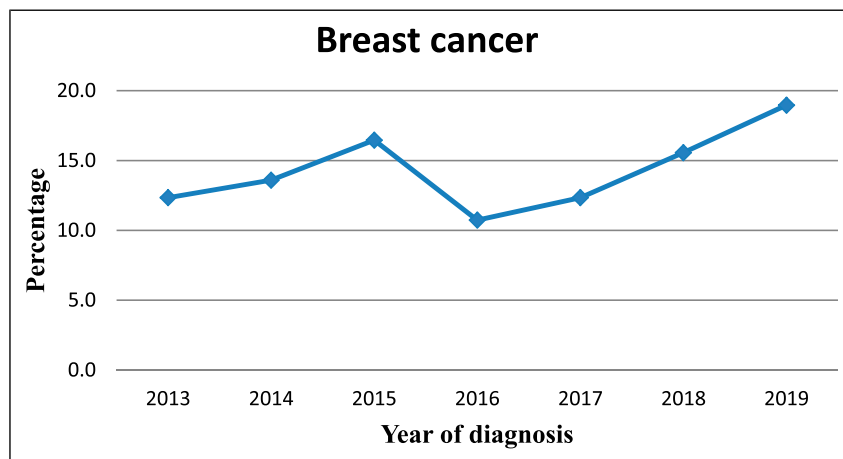
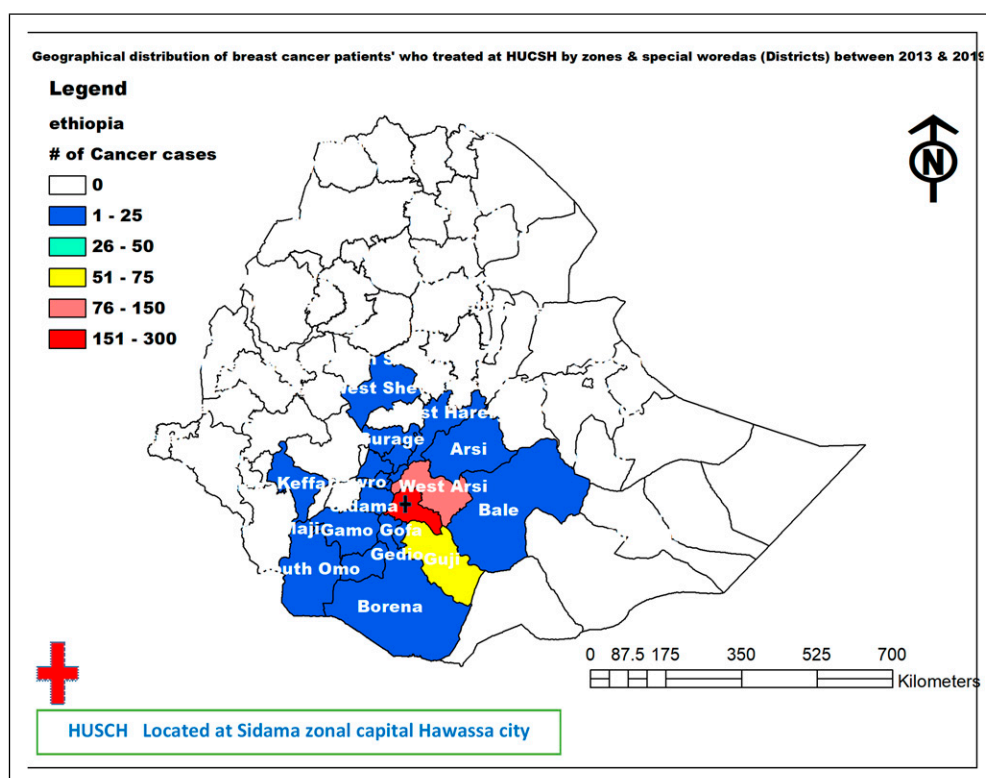


Figure 4. Trends of breast cancer from 2013 to 2019 at HUCSRH.



Map 1. Cancer distribution map.

Previously, there was one cancer treatment center, which is located in the capital city of the country, but currently there are 8 regional cancer treatment centers which are providing diagnostic and treatment and follow up services and relative improvement of community awareness. The study found that all patients were treated with chemotherapy. This is due to the fact that the ER and PR status of the patients was not known and that the majority of the patients arrived at an advanced stage. This is consistent with the survey conducted in Ethiopia.²²

Modified radical mastectomy (MRM) was the type of surgical treatment for all women with Stage 1 to 3 breast cancer. This is because of the lack of radiotherapy and women are coming at a relatively advanced stage of breast cancer. This makes it very difficult to perform a lumpectomy or breast conservative surgery. This result is consistent with studies conducted in Ethiopia and other developing countries.^{22,23}

The limitation of this study was difficult to measure the treatment outcome of the patients. This is due to the absence of

Table 2. Types of Treatment Received at HUCSRH Between 2013 and 2019.

Types of Treatment	Count N = 559	Percent
Chemotherapy (Stage I–III)		
Doxorubicin, cyclophosphamide, and paclitaxel every 3 weeks for 8 cycle	330	59
Chemotherapy breast cancer Stage IV doxorubicin and cyclophosphamide every 3 weeks for 6 cycle	229	41
Surgery (modified radical mastectomy)	196	35.1
Hormonal therapy for premenopausal women and men		
Tamoxifen 20 mg po per day	64	76.7
Hormonal therapy post-menopausal women anastrozole 1 mg po/day after surgery	20	23.3
Chemotherapy alone	363	65
Chemotherapy plus surgery	112	20
Chemotherapy plus surgery and hormonal therapy	84	35

genetic tests such as BRCA 1 and BARCA2, ER, PR, HER2, and Ki67 in the study setting. In addition, no targeted or biological treatment such as trastuzumab and also no radiotherapy services in the hospital. If these were available, the treatment going to be specific and target full as per the breast cancer biology (ER/PR and HER2 status), which significantly reduce over treatment, unnecessary financial and treatment toxicity. It also basically improves the treatment outcome and quality of life of the patients. As well, it helps to understand the biology of breast cancer across the country which is very important for decision-makers to plan for targeted treatment depending on the proportion of receptors or the biological status of the cancer.

Further study, particularly on cancer biology, may be helpful in determining why women had cancer at an early age.

Conclusion

There is high breast Ca burden. Breast Ca affects young adult women (30–50 years), and they are coming late to the hospital for treatment, diagnosed with advanced stage, ductal invasive Ca being the commonest. So treatment has to be expanded, preventive strategies need to be designed like routine scheduled screening. Probably starting earlier age at age 30 years is important. Awareness creation about breast Ca, early detection, treatment seeking, service availability, and treatment modalities is so mandatory. Further study might be important to answer why younger adult women affected, to measure the risk factors and clinical pathologic features of the disease.

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Author Contributions

All the 3 authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content.

Authors' Note

This study approved by Hawassa University College of medicine and health science Institutional Review Board with the reference number of (No. IRB/047/11, dated February 26, 2019). The study was conducted in collaboration with the oncology unit staffs. Maximum precaution was made in terms of maintaining the confidentiality of patient records. Names or any other personal identifying data were not collected for the study. The study data was handled by the study team and saved on password protected computer that was accessed only by the study PI. The patient charts were returned to the hospital archives as soon as data extraction was completed. Individual patient consent was waived by the ethics committee as this was retrospective study based on routinely collected data.

Declaration of Conflicting Interests

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