Early onset, delayed diagnosis and laterality of breast carcinoma: Evidence from a tertiary care hospital

Bickes Wube Sume[1] 🅘🅓, **Wubshet Assefa[2]** 🅘🅓
and Yoseph Merkeb Alamneh[1] 🅘🅓

Abstract

Objectives: To assess age at onset, delayed diagnosis and laterality of breast carcinoma among women at Debre Markos Comprehensive Specialized Hospital, North West Ethiopia.

Methods: Hospital-based descriptive study was conducted on 120 breast carcinoma cases at pathology department of Debre Markos Comprehensive Specialized Hospital, from October 2019 to December 2021. The women aware of symptoms until first medical consultation time was asked. The height and weight of the women were measured using the height and weight scale. The attending physician examined both breasts and regional lymph nodes. Pathological features of breast carcinomas were recorded when biopsy results arrived at the pathology department. Data were entered in Epi data version 3.1. Then, it was exported to SPSS version 25.0 statistical software for analysis.

Results: Mean age of women was 39.9 ± 11.6 years, and median age was 38 years. Most women, 87 (72.5%) were aged less than 46 years. One hundred three (85.8%) women had complained breast lump pain for greater than 3 months before diagnosis. About 61 (50.8%) women had left breast carcinomas; 44 (36.7%) had right breast carcinomas and 15 (12.5%) had bilateral breast carcinomas. Of total, 53 (44.2%) cases were invasive ductal carcinomas; 41 (34.2%) had ductal carcinoma in situ; 14 (11.7%) were invasive lobular carcinomas; 8 (6.7%) were lobular carcinoma in situ and only 4 (3.3%) cases were mixed carcinomas.

Conclusion: In this study, about two-third of the cases had early onset breast carcinoma. Most of the cases had delayed diagnosis of breast carcinoma. More than half of the cases had left breast carcinoma.

Keywords

Early onset, delayed diagnosis, laterality, breast carcinoma

Introduction

Among women, breast lump is the most common presenting symptom to outpatient department because of anxiety for patients and their families due to fear of carcinoma of breast.[1] Previous studies mainly from Western and Central Africa revealed that breast cancer had occurred at younger ages with aggressive features.[2]

Breast cancer that develops between the ages of 18 and 45 years known as early onset breast cancer. Early onset breast cancer accounted for 10.3% of all new female breast cancer cases between 2012 and 2016. Furthermore, women under the age of 45 years accounted for 5.6% of all breast cancer deaths in the United States.[3]

Breast cancer diagnosed before the age of 45 years accounted for approximately 15% of all deaths from diseases.

Women with early onset breast cancer face unique survivorship challenges, including contraception, menopausal symptom management, fertility preservation and pregnancy.[4]

Delayed diagnosis of breast cancer can be either patient delay, provider delay or health system delay. The long patient

[1]Department of Biomedical Sciences, School of Medicine, Debre Markos University, Debre Markos, Ethiopia
[2]Department of Pathology, School of Medicine, Debre Markos University, Debre Markos, Ethiopia

Corresponding author:
Bickes Wube Sume, Department of Biomedical Sciences, School of Medicine, Debre Markos University, P.O. Box: +269, Debre Markos, Ethiopia.
Email: bkswbe123@gmail.com

delay time is more than or equal to 3 months (90 days) from the time a patient became aware of symptoms until first medical consultations, whereas short patient delay time is less than 3 months (<90 days).[5–7]

Because of its nature, cancer is a great challenge to control and eradicate at the community level. However, it is possible to reduce the consequences of cancer on the community if powerful measures are taken to manage the risk factors associated with cancer, provoke early detection and provide best services for those with cancer. In keeping with Globocan 2012 estimates, approximately 40% of cancer cases are preventable.[8] Widespread urbanization, environmental factors, overweight, decreased physical exercise and raised life expectancy are among many salient factors implicated for breast cancer incidences throughout low-income countries.[9–11]

In Addis Ababa, capital city of Ethiopia, breast cancer is the commonest malignant tumor among women. The cancer registry report in Addis Ababa revealed that breast cancer accounts about 34% of all feminine cancers and 16% were cervical cancers.[11] Even though most breast cancer cases have a markedly increased incidence in developed countries, half of all new breast cancer cases and 60% of breast cancer deaths happened in developing countries.[11,12] Thus, this study aimed to assess age at onset, delayed diagnosis and laterality of breast carcinoma among women at pathology department, Debre Markos Comprehensive Specialized Hospital (DMCSH).

Materials and methods

Study area and period

This study was conducted at pathology department, DMCSH, from October 2019 to December 2021. DMCSH is located in Debre Markos town, East Gojam zone, Amhara regional state, Ethiopia. Debre Markos town is far from 300 km from Addis Ababa, the capital city of Ethiopia, and 265 km from Bahir Dar, the capital city of Amhara regional state. This hospital provides health services for more than 5 million people living within the catchment area.

Study design

It is a hospital-based descriptive study.

Source population and study population

All women who had breast lump pain and appointed for breast biopsy result at pathology department considered as a source population of the study. All women who had breast lump pain and came for breast biopsy result at pathology department within the study period taken as a study population.

Inclusion and exclusion criteria

We have recruited all women who had breast carcinoma and voluntary to participate in the study. However, those who had benign breast biopsy result and involuntary to participate were excluded from the study. Thus, all breast carcinoma cases within the study period were included in the study.

Data collection procedures

Pre-tested, structured and interviewer–based Amharic version questionnaire was used to collect socio-demographic data and other reproductive history. The questionnaire was developed after reviewing related literatures.[3,4,6,13] Before data collection, it was tested in 5% of study participants at Lumame hospital. Stadiometer and weight balance were used to measure height and weight of study subjects. The attending physician required to fill a form containing age, educational background, occupation, duration of symptoms, reproductive history and findings on physical examination of tumor and regional lymph nodes. Pathological features of breast carcinomas were also recorded when biopsy results arrived at the pathology department. The Nottingham grading system (NGS) was used to grade the tumor. All data collections were carried out when the woman came to receive the biopsy result.

Statistical analysis

Data were entered in Epi data version 3.1, and analyzed using SPSS version 25.0 statistical software. Frequencies and percentages were used to describe the study participants. Narratives and tables were also used to present the findings.

Results

Socio-demographic characteristics

About 120 women who had breast carcinoma were participated in the study. Mean age of women were 39.94 ± 11.6 years, and median age were 38 years. About 48.3% of women were aged 31–45 years. Majority of women (55.8%) came from urban areas (Table 1).

Anthropometric measurements

The height of study subjects was ranged from 145 to 172 cm with mean height 159.19 ± 6.04 cm. Their weight also ranged from 35 to 74 kg with mean of 52.32 ± 6.44 kg (Table 2).

Reproductive history and duration of breast lump pain

About 91.7% of study subjects' age of menarche ranged from 12 to 16 years. However, 52.5% of women having breast cancer had irregular history of menstruation. Whereas 67.5% of

Table 1. Socio-demographic characteristics of study subjects at Debre Markos Comprehensive Specialized Hospital, North West Ethiopia, 2021 (N = 120).

Characteristics	Frequency	Percent (%)
Age group		
15–30	29	24.2
31–45	58	48.3
46–75	33	27.5
Religion		
Orthodox	86	71.7
Muslim	24	20.0
Protestant	10	8.3
Residence		
Urban	67	55.8
Rural	53	44.2
Marital status		
Single	28	23.3
Married	68	56.7
Divorced	18	15.0
Widowed	6	5.0
Educational status		
No education	60	50.0
Primary education	28	23.3
Secondary education	24	20.0
Tertiary education	8	6.7
Occupation		
Housewife	73	60.8
Employed	19	15.8
Unemployed	28	23.3

Table 2. Anthropometric measurements of study subjects at Debre Markos Comprehensive Specialized Hospital, North West Ethiopia, 2021 (N = 120).

Parameters	Minimum	Maximum	Mean	Standard deviation (SD)
Height (cm)	145	172	159.19	6.04
Weight (kg)	35	74	52.32	6.44
BMI	13	27	20.62	2.03

BMI: body mass index.

Table 3. Reproductive history and duration of breast lump pain of study subjects at Debre Markos Comprehensive Specialized Hospital, North West Ethiopia, 2021 (N = 120).

Characteristics	Frequency	Percent (%)
Give birth		
Yes	85	70.83
No	35	29.17
Age at first live birth		
≤20 years	28	23.3
>20 years	57	47.5
Breast feeding		
Yes	54	45.0
No	31	25.83
Age at menarche		
≤11 years	3	2.5
12–16 years	110	91.67
>16 years	7	5.83
Menopause status		
Premenopause (≤45)	87	72.5
Menopause (>45)	33	27.5
Menstrual status		
Regular	24	20
Irregular	63	52.5
Family history of breast cancer		
Yes	22	18.3
No	98	81.7
Oral contraceptive use		
Yes	90	75.0
No	30	25.0
History of breast disease		
Yes	81	67.5
No	39	32.5
Breast lump pain duration		
<3 months	17	14.2
3–6 months	50	41.7
>6 months	53	44.1

women having breast cancer had history of breast disease, 18.3% had family history of breast cancer, and 75% had history of oral contraceptive use. Of total, 50 (41.7%) had history of 3–6 months breast lump pain before diagnosis. Whereas 53 (44.1%) women had breast lump pain for greater than 6 months before diagnosis (Table 3).

Laterality of breast carcinoma, location and lymph node involvement

About 50.8% of study subjects had left breast carcinoma whereas 36.7% had right breast carcinoma. In clockwise direction, breast carcinoma at central quadrant of breast was high (56.7%) in both breasts. However, breast carcinoma at inferolateral quadrant of breast was low (0.83%) as compared to other quadrants of breast. About 54.2% of women having breast carcinoma had axillary lymph node involvement whereas 30.8% of women having breast carcinoma had no nodal involvement at all (Table 4).

Pathological features of breast carcinoma

About 44.2% of study subjects had invasive ductal carcinoma, and 34.2% had ductal carcinoma in situ. Majority of study subjects (50.8%) were grade II tumors whereas 18.3% were grade III tumors at the time of diagnosis. About 47.5% of study subjects had tumor (T2) size 2–5 cm whereas 50.0% of study subjects had tumor size (T1) ≤2 cm (Table 4).

Table 4. Pathological features of breast carcinoma and its laterality, location and lymph node involvement of breast carcinoma among study subjects at Debre Markos Comprehensive Specialized Hospital, North West Ethiopia, 2021 (N=120).

Variable	Frequency	Percent (%)
Pathological features		
Invasive ductal carcinoma	53	44.2
Invasive lobular carcinoma	14	11.7
Ductal carcinoma in situ	41	34.2
Lobular carcinoma in situ	8	6.7
Mixed carcinoma	4	3.3
Tumor size		
Tumor (T1) ⩽2 cm	60	50.0
Tumor (T2) >2 cm and ⩽5 cm	57	47.5
Tumor (T3) >5 cm	3	2.5
Tumor grade		
Grade I	37	30.8
Grade II	61	50.8
Grade III	22	18.3
Laterality		
Right breast carcinoma	44	36.7
Left breast carcinoma	61	50.8
Bilateral breast carcinoma	15	12.5
Location/quadrant		
Superomedial	32	26.7
Inferomedial	6	5.0
Superolateral	13	10.8
Inferolateral	1	0.83
Central	68	56.7
Lymph node involvement		
Axillary	65	54.2
Parasternal	13	10.8
Supraclavicular	5	4.2
No involvement	37	30.8

Discussion

Breast cancer is a major challenge in developing countries for diagnosis and management especially due to low awareness, late presentation and lack of advanced technology to explore its pathological and clinical behavior early.[14] This study conducted on 120 breast cancer cases to assess age at onset, delayed diagnosis and laterality of breast carcinoma among women presenting at pathology department, DMCSH.

In this study, mean and median age of patients were 39.94 and 38 years, respectively. About 24.2% and 48.3% of patients belong to age group 15–30 and 31–45 years, respectively. This was in line with the study conducted by Hadgu et al.[11] at Tikur Anbessa Specialized Hospital (TASH) on 114 breast cancer patients (mean age=43 years and median age=40 years). Another study done by Shenkutie et al.[15] at TASH on 137 breast cancer cases (mean age=47 years and median age=46.7 years) was also in line with the current findings. Similar studies from Libya and Rwanda research

groups were also reported that median age of 45 and 49 years, respectively, which were not considerably far away from this study.[6,7] Furthermore, comparison of the age of onset and presentation of breast cancer between Sudanese and Italian women presented at mean age of 52 years and 63 years, respectively, that showed remarkable differences from this study.[16] This might be due to differences in life expectancy among countries or it could be early community-based health education, which prevents predisposing factors for early onset breast carcinomas.

Findings of this study (median age=38 years) also contrasted to other studies of breast cancer patients in Canada (median age=54 years), Germany (median age=58 years) and Belgium (median age=58 years)[17–19] (Additional File). Early onset breast cancer in this study might be due to poor life quality in developing countries as compared to developed countries. However, it might be due to its aggressive nature that would be a reflection of African cancer biology.[20]

This study revealed majority of patients (85.8%) presented and delayed diagnose at health institutions. It took about greater than 3 months to claim breast pain at health institutions. These findings agreed with studies conducted in other settings of Ethiopia (7 up to 12 months), Yemen (18 months) and University of Pittsburgh (greater than 9 months).[21–23] Findings of this study were also considerable consistent with study findings done in Los Angeles which revealed late stage diagnosis and long duration of symptoms of breast cancer.[24] However, late presentation in this study contrasted with study findings done in developed countries like Germany.[25] It might be due to lack of screening program, poor access to health facilities including pathology service in this study. The other plausible discrepancy could be low awareness of breast cancer symptoms, poverty, lack of affordability of medical expenses and geographic distance to screening services. Early diagnosis and improved survival in Western countries reported in several studies attributed to screening programs.[26]

In this study, about 91.7% of patients' age of menarche ranged from 12 to 16 years. Almost half of patients (52.5%) had irregular history of menstruation, and 67.5% of patients had history of breast disease whereas 18.3% of patients had family history of breast cancer. It was also found that two-third (75%) of patients had history of oral contraceptive use. These findings agreed with other studies conducted in Stanford University, Nashville Hospitals and cancer report in Geneva.[27–29]

In this study, patients had 50.8% left, 36.7% right and 12.5% bilateral breast carcinoma. About 56.7% and 26.7% of patients' had central and superomedial quadrants breast carcinoma, respectively. These findings were considerably comparable with other studies conducted in Ethiopia at TASH (axillary lymph node involvement=52.3%), at other three Hospitals in Addis Ababa (left breast=46.2%, right breast=53.8%) and (upper outer quadrant=78.2%, central=6.1%).[15,23]

This study revealed that left breast carcinoma (50.8%) was most common as compared to right breast carcinoma (36.7%). This was similar to study findings in Ghana which revealed that 50.9% of cases had left breast cancer and 49.1% of cases had right breast cancer.[30] Our findings also agreed with previous studies conducted in other centers, where left breast was reported as most commonly affected.[31] This might be due to breast cancer occurs more frequently in the left breast, which is typically due to left breast slightly larger than the right breast.[32]

However, findings of this study disagreed with a study reported by Gemta et al.[23] that right breast cancer was most commonly affected with upper outer quadrant involvement either separately or in combination with other parts of the breast. Some other studies explored that the effect of breast size was a risk factor for cancer, it is inconclusive, and not known whether laterality had any prognostic significance in breast cancer.[32] This study also revealed that the central quadrant mostly involved in breast carcinomas followed by superomedial quadrant. This disagreed with reported study in West Africa that upper outer quadrant was mostly affected in cancer.[31]

Histopathologic characteristics of tumor are a known factor influencing prognosis and predicting survival of patients with breast carcinomas. In this study, most of patients had ductal carcinoma (invasive = 44.2%, in situ = 34.2%) followed by lobular carcinoma (invasive = 11.7%, in situ = 6.7%). Only 3.3% of patients had mixed carcinomas (lobular and ductal). Similarly, other studies reported that invasive ductal carcinoma was most common histological variant of breast cancer. A study conducted at three hospitals in Addis Ababa, invasive ductal carcinoma accounts 79.2%, lobular carcinoma accounts 8.1% and mixed carcinoma accounts 3.6%.[23] Another study conducted in Ethiopia at Addis Ababa University Radiotherapy Center, invasive ductal carcinoma accounts 79.2% and lobular carcinoma accounts 5.1%.[33] In Ethiopia, another retrospective study done at oncology center in TASH, infiltrating ductal carcinoma accounts 60% and lobular carcinoma accounts 10%.[11] Other similar studies also reported from Tanzania (90%), Nigeria (95%) and Norway (81.4%) had most common ductal carcinoma.[31,34,35]

A study conducted at Queen Elizabeth Central Hospital in Malawi revealed breast cancer with ductal, mixed ductal and lobular carcinoma has been found to have a 10-year survival below 50%.[32] Another study conducted in Nigeria reported that tubulo-lobular and mucinous type have usually an excellent prognosis with a 10-year survival of >80%.[36]

In this study, 50% of patients had tumor size (T1) less than 2 cm followed by tumor size (T2 = 47.5%) greater than 2 cm and less than 5 cm. About 50.8% of patients and 18.3% of patients had grade II tumor and grade III tumor, respectively. Whereas 30.8% of patients had grade I tumor. These study findings were comparable with study done at TASH that 45% of cases had tumor size (T2 = 47.5%) greater than

2 cm and less than 5 cm; 51% had grade II and 35.4% grade III tumors.[15] Another previous study in Ethiopia by Gemta et al.[23] reported that 47.2% of case had tumor size (T2) and 17.3% and 46.2% of cases present with grade I and grade II tumors, respectively. In this study, only 2.5% of patients had tumor size (T3) greater than 5 cm. This was comparable in principle that tumor greater than 5 cm in diameter is at high risk of relapse of breast cancer.[34]

Limitation of the study

- This study could not assess the predisposing factors of breast carcinoma because it was a descriptive study.
- The study might be exposed to recall bias.

Conclusion

About two-third of the cases had early onset breast carcinomas. Most of the cases had delayed diagnosis of breast carcinoma. They took more than 3 months to seek health facilities for diagnosis. More than half of the study cases had left breast carcinoma whereas one-third of cases had right breast carcinoma. Thus, health professionals and policymakers should advocate and implement early breast cancer screening, especially in young age women.

Author contributions

B.W.S., W.A. and Y.M.A. equally contributed to the conceptualization, statistical analysis, interpretation of data and write up of the manuscript. All authors reviewed and approved the final version of the manuscript.

Availability of data and materials

The raw data used for analysis were available from the corresponding author upon reasonable request.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical approval

Ethical approval for this study was obtained from Ethical Review Committee, School of Medicine, Debre Markos University with reference no. SOM/701/19/12. RTTD-003.

Informed consent

Written informed consent was obtained from all subjects before the study.

ORCID iDs

Bickes Wube Sume 🔟 https://orcid.org/0000-0001-9707-6439

Wubshet Assefa 🔟 https://orcid.org/0000-0002-5428-1624

Yoseph Merkeb Alamneh 🔟 https://orcid.org/0000-0001-7612-4809

Supplemental material

Supplemental material for this article is available online.

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