

Original Research Article

Epidemioclinical aspects of breast cancer in women under 35 years at the oncology and palliative care department of Soavinandriana Hospital

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ABSTRACT

Background: Breast cancer is rare among women under 35 years, but its incidence is increasing, particularly in low-resource settings. Young patients often present with aggressive disease and delayed diagnosis. This study aimed to describe the epidemioclinical features of breast cancer in this population.

Methods: A retrospective descriptive study was conducted from January 2014 to September 2024 at the oncology and palliative care department of Soavinandriana Hospital, Madagascar. 38 women under 35 years old with histologically confirmed breast cancer were included.

Results: Among 2,087 breast cancer cases, 38 (1.82%) involved women under 35. The mean age was 30.7 years. Most patients were pauciparous (50%), had breastfed (73.7%), were non-smokers (81.6%), and had no family history of breast or ovarian cancer (76.3%). The upper outer quadrant was the most common tumor site (34.2%). Invasive carcinoma of no special type was predominant (78.9%). Grade II and III tumors accounted for 65.8%. More than 50% of patients were diagnosed at an advanced stage (IIB or higher). Immunohistochemical and staging data were frequently incomplete due to limited diagnostic resources.

Conclusions: Breast cancer in young Malagasy women is uncommon but presents aggressively and at advanced stages, underscoring the need for early detection strategies. Improved diagnostic access and tailored screening programs are essential

Keywords: Breast cancer, Young women, Epidemiology, Histopathology, Low-resource settings

INTRODUCTION

Breast cancer is a malignant disease resulting from the abnormal proliferation of epithelial cells within mammary tissue. It is the most common cancer among women worldwide, accounting for approximately 25% of all cancer cases and 15% of cancer-related deaths.¹ According to estimates by the World Health Organization (WHO), around 2.3 million new breast cancer cases were diagnosed

globally in 2020, with approximately 685,000 deaths attributed to the disease.² Although its incidence increases with age, a growing number of cases are being reported among women under the age of 35, representing nearly 4% of total diagnoses in 2020.³

In Madagascar, breast cancer accounts for approximately 35% of all cancers diagnosed in women, with nearly 40% of patients presenting at an advanced stage of disease.⁴

These statistics highlight a critical gap in the understanding and management of breast cancer within the Malagasy context, where access to healthcare services remains limited. Despite the increasing burden of breast cancer among young women, epidemiological and clinical data on this subpopulation are scarce. Limited awareness, inadequate early detection programs, and poor access to diagnostic tools frequently result in delayed diagnoses and unfavorable outcomes. Indeed, 50% of breast cancer cases among women under 35 in Madagascar are diagnosed at an advanced stage.⁵ Additionally, socioeconomic and cultural barriers may further hinder access to timely care and treatment, thus compromising prognosis.⁶

In this context, we conducted the present study to describe the epidemiological and clinical characteristics of breast cancer in women under 35 years of age managed at the Oncology and Palliative Care Department (SOSP) of the Soavinandriana University Hospital. The specific objective was to assess the clinical profile of this population in order to generate evidence that may inform national health policies and improve patient care strategies in this age group.

METHODS

Study design and setting

This was a retrospective, descriptive study conducted in the department of oncology and palliative care (SOSP) at the Soavinandriana Military Hospital (CENHOSOA), a national referral center in Antananarivo, Madagascar.

Study period and population

All female patients under 35 years of age diagnosed with breast cancer and managed at the SOSP between January 1, 2014, and September 30, 2024, were eligible.

Eligibility criteria

Inclusion criteria

Female patients aged <35 years at diagnosis, histological and/or cytological confirmation of breast carcinoma, complete medical records available.

Exclusion criteria

Age ≥ 35 years at diagnosis, male breast cancer, missing pathological data or incomplete records.

Sample size

An exhaustive sampling was performed during the study period, from January 2014 to September 2024. A total of

38 cases fulfilling the predefined inclusion criteria were identified and enrolled for analysis

Data collection and variables

Data were extracted from medical records using a standardized collection form. Clinical variables included age, reproductive history (age at menarche, parity, breastfeeding, age at first pregnancy), family history of malignancies, toxic habits (smoking, alcohol), and mode of tumor discovery. Tumor characteristics comprised laterality, quadrant, local and metastatic spread, and presenting symptoms.

Paraclinical variables included: serum marker: CA 15-3; imaging: mammography and breast ultrasound classified using BI-RADS (American College of Radiology); histopathology: tumor type per WHO classification (2012), histological grade (Scarff-Bloom-Richardson system), vascular or perineural invasion, nodal extracapsular extension; immunohistochemistry: estrogen receptor (ER), progesterone receptor (PR), HER2 status, Ki-67 index; staging: pTNM and clinical stage according to AJCC 8th edition (2017).

Statistical analysis

Data were analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize categorical and continuous variables.

Ethical considerations

Patient confidentiality was strictly maintained. Informed consent for research use of clinical data was considered granted through standard care procedures. Institutional approval was obtained from hospital and departmental authorities prior to data collection.

RESULTS

Between 2014 and 2024, 2,087 cancer cases were recorded at CENHOSOA's oncology department, including 312 breast cancers. Among these, 38 cases (1.82%) occurred in women under 35, with peak incidence in 2022 (n=9; 4.95%) (Table 1).

The mean age at diagnosis was 30.71 ± 4.52 years, predominantly between 30-34 years. Early menarche (<12 years) was reported in 13.2%, and 50% were pauciparous. Most had a normal age at first pregnancy (76.3%) and a history of breastfeeding (73.7%). Smoking and alcohol use were noted in 15.8% and 36.8%, respectively. Specifically, 10.5% (n=4) had a first-degree familial history, 76.3% (n=29) had none, and 13.2% (n=5) were undetermined (Tables 2).

Table 1: Distribution of breast cancer cases in women under 35 by year.

Year	Total cancers	Breast cancer cases	<35 years cases	%
2024	174	28	2	1.15
2023	237	54	7	2.95
2022	182	42	9	4.95
2021	166	34	3	1.81
2020	170	27	5	2.94
2019	285	26	2	0.70
2018	196	16	3	1.53
2017	95	15	2	2.11
2016	150	25	1	0.67
2015	270	35	2	0.74
2014	162	10	2	1.23
Total	2087	312	38	1.82

Table 2: Demographic and clinical characteristics of patients (n=38).

Demographic and clinical characteristics	N	%
Age group (years)		
<20	2	5.26
20-24	2	5.26
25-29	8	21.05
30-34	26	68.42
Menarche		
Early menarche (<12 years)	5	13.2
Normal menarche	26	68.4
Late menarche	7	18.4
Parity		
Nulliparous	5	13.2
Primiparous	13	34.2
Pauciparous (1–2 children)	19	50.0
Multiparous (>2 children)	1	2.6
Age at first pregnancy		
Early pregnancy (<20 years)	0	0.0
Normal pregnancy age (20-30)	29	76.3
Unknown	9	23.7
Breastfeeding		
No	5	13.2
Yes	28	73.7
Unknown	5	13.2
Toxic habits		
Smoking		
No	31	81.6
Yes	6	15.8
Unknown	1	2.6
Alcohol		
Yes	14	36.8
No	24	63.2
Family history of breast cancer		
First-degree relative	4	10.53
No family history of breast cancer	29	76.32
Unknown	5	13.16

Table 3: Clinical presentation of cancers (n=38).

Clinical presentation of cancers	N	%
Circumstances of tumor discovery		
Self-palpation of the tumor by the patient	17	44.74
Clinical manifestations of the breast tumor	15	39.47
Incidental finding during routine examination	6	15.79
Breast symptoms		
Breast lump/swelling	19	50.00
Mastodynia (breast pain)	15	39.47
Breast volume asymmetry	4	10.53
Side of breast affected		
Left breast	16	42.1
Right breast	18	47.4
Bilateral	4	10.5
Specific site on the breast		
Upper inner quadrant, right (UIQ-R)	3	7.9
Upper outer quadrant, right (UOQ-R)	13	34.2
Lower inner quadrant, right (LIQ-R)	3	7.9
Lower outer quadrant, right (LOQ-R)	0	0.0
Upper outer quadrant, left (UOQ-L)	6	15.8
Upper inner quadrant, left (UIQ-L)	5	13.2
Lower inner quadrant, left (LIQ-L)	3	7.9
Lower outer quadrant, left (LOQ-L)	0	0.0
Other*	5	13.2

*Note: 'Other' may include retro-areolar, central, or diffuse locations.

Tumors were mostly detected via self-examination or mastalgia. Common presentations included a palpable mass (50%) and breast pain (39.5%). The right breast was involved in 47.4% of cases, the left in 42.1%, and both in 10.5%. The upper outer quadrant was the most affected region (34.2%) (Table 3).

CA 15-3 was elevated (≥ 30 U/ml) in 10.5% of cases, though 47.4% lacked data. Imaging classified 18.4% as

BI-RADS 5 and 15.8% as BI-RADS 4; 36.8% were unclassified (Tables 4 and 5).

Table 4: Initial CA 15-3 levels (n=38).

CA 15-3 level	N	%
Low (<30 U/ml)	16	42.1
High (≥30 U/ml)	4	10.5
Unknown	18	47.4

Table 5: Initial mammographic assessment (n=38).

BiRADS/ACR Classification	N	%
ACR 0 (Incomplete)	1	2.6
ACR 1 (Negative)	1	2.6
ACR 2 (Benign)	4	10.5
ACR 3 (Probably benign)	5	13.2
ACR 4 (Suspicious abnormality)	6	15.8
ACR 5 (highly suggestive of malignancy)	7	18.4
Unknown	14	36.8

Table 6: Anatomopathological characteristics of breast cancers (n=38).

Anatomopathological characteristics	N	%
Histological types		
Ductal carcinoma in situ	2	5.3
Lobular carcinoma in situ	2	5.3
Invasive carcinoma of no special type	30	78.9
Invasive carcinoma of specific type	4	10.5
Scarff-Bloom and Richardson (SBR) grade		
SBR I	8	21.1
SBR II	12	31.6
SBR III	13	34.2
Unknown	5	13.2
Presence of vascular or perineural embolism		
Negative	12	31.6
Positive	3	7.9
Unknown	23	60.5
Presence of lymph node capsular rupture		
No	34	89.5
Yes	3	7.9
Unknown	1	2.6

Invasive carcinoma NST was predominant (78.9%). SBR grades II and III accounted for 65.8%. Vascular/perineural invasion was present in 7.9%; nodal capsular rupture was absent in 89.5% (Table 6). Hormone receptor and HER2 positivity were each observed in 7.9%; high Ki-67 in 2.6%. Immunohistochemistry data were incomplete (60–84%), limiting molecular classification (Table 7).

AJCC (8th ed.) staging showed 21.1% at stage IIB, 13.2% at IIIA, and 13.2% at IV. Staging was indeterminate in 50% due to missing data (Table 8).

Table 7: Immunohistochemical characteristics of breast cancer (n=38).

Immunohistochemical characteristics	N	%
Estrogen receptor		
Negative	12	31.6
Positive	3	7.9
Unknown	23	60.5
Progesterone receptors		
Negative	10	26.3
Positive	3	7.9
Unknown	25	65.8
HER2		
Negative	3	7.9
Positive	3	7.9
Unknown	32	84.2
Ki67		
Low (≤20%)	9	23.7
High (>20%)	1	2.6
Unknown	28	73.7

Table 8: Staging according to clinical/pathological stages (AJCC 2017 v8) (n=38).

Stage	N	%
IIB	8	21.1
IIIA	5	13.2
IIIC	1	2.6
IV	5	13.2
Unknown	19	50.0

DISCUSSION

Between 2014 and 2024, 2,087 cancer cases were reported at CENHOSOA, including 312 breast cancers (14.95%). Among them, 38 cases (1.82%) occurred in women under the age of 35. This rate is comparable to that reported by Cancado et al, Brazil, but notably higher than the 0.5% observed by Diallo et al, Senegal.^{7,8} Such disparities may reflect differences in access to screening, healthcare infrastructure, and exposure to risk factors, as suggested by Musa et al, Nigeria.⁹

The mean age at diagnosis was 30.71 years (range: 17-34), with 68.4% of patients aged between 30 and 34. This is consistent with findings from Azim et al, Belgium and Fakhry et al, Lebanon, who reported average or median ages around 31-32 years. These results support the hypothesis that hormonal and reproductive factors may contribute to early-onset breast cancer.¹⁰

In our series, 13.2% of patients experienced early menarche, 13.2% were nulliparous, and 73.7% had a history of breastfeeding. These figures are lower than those reported by Assi et al, Lebanon, Anderson et alUSA, and Diallo et al, Senegal.¹¹⁻¹³ This variation may be influenced by sociocultural norms in Madagascar, such as early maternity and extended breastfeeding.

Tobacco use was reported in 15.8% of cases and alcohol consumption in 36.8%, both lower than figures from Mqoqi et al, South Africa, and Fatma et al, Tunisia.^{14,15} These differences may be attributed to cultural practices, religious influences, or underreporting.

A first-degree family history of breast cancer was present in 10.5% of cases- lower than the 17% reported by Anders et al, USA, and the 21% found by Rhiem et al, France.^{16,17} Limited knowledge of family medical history or underdiagnosis among relatives may contribute to this discrepancy.

Most tumors were identified either through breast self-examination (44.7%) or due to symptoms such as pain or asymmetry (39.5%). Only 15.8% were discovered incidentally. Similar detection patterns have been described by Ibrahim et al, Egypt, and El Fakir et al, Morocco. In contrast, Dilhuydy et al, France, reported that 28% of cases were detected during routine checkups, highlighting the lack of systematic screening in Madagascar for this age group.¹⁸⁻²⁰

The most common presenting symptoms were palpable masses (50%), mastodynia (39.5%), and breast asymmetry (10.5%). These findings are in line with studies from Ndom et al, Cameroon, Houssami et al, Australia, and Abebe et al, Ethiopia, which point to delayed presentation and limited early detection.²¹⁻²³

The right breast was affected in 47.4% of cases, the left in 42.1%, and both in 10.5%. The upper outer quadrant was the most frequent tumor location, consistent with observations from Silva et al, Brazil, and Lee et al, South Korea, possibly due to anatomical factors such as glandular density and lymphatic drainage.^{24,25}

Elevated CA 15-3 levels (≥ 30 U/ml) were found in 10.5% of cases, while 42.1% had normal levels and 47.4% had missing data. These results are in agreement with Duffy et al, UK, and Molina et al, Spain, who noted that CA 15-3 is typically normal in early-stage breast cancer and rises mainly in advanced disease. The high rate of missing values may reflect limited access to tumor marker testing.^{26,27}

Imaging assessments revealed BI-RADS 5 in 18.4%, BI-RADS 4 in 15.8%, and BI-RADS 3 in 13.2% of cases, while 36.8% were unclassified. These distributions are comparable to those reported by Berg et al, USA, and Barr et al, USA, who observed similar patterns in symptomatic young women. The lack of classification in our series likely reflects reporting gaps or resource limitations.^{28,29}

Histopathology showed that 78.9% of cases were invasive carcinoma of no special type. Grades II and III tumors were predominant (31.6% and 34.2%, respectively). Vascular or perineural invasion and nodal capsular rupture were found in 7.9% of cases. These aggressive features are

consistent with findings from Rakha et al, UK, Bourhafour et al, Morocco, and Sandhu et al, India.³⁰⁻³²

Immunohistochemical data were limited, with 60-84% of cases missing. Among available results, hormone receptor and HER2 positivity were each found in 7.9%, while only 2.6% had a high Ki-67 index. This profile suggests a likely predominance of triple-negative breast cancer, as described by Cancellato et al, Italy, Odetola et al, Nigeria, and Thangjam et al, India.³³⁻³⁵

More than 50% of patients presented at advanced stages: IIB (21.1%), IIIA (13.2%), and IIIC or IV (13.2%). In 50% of cases, staging could not be determined due to missing data. Similar delays in diagnosis have been reported by Nwankwo et al, Nigeria, Gupta et al, India, and Alshahrani et al, Saudi Arabia, reflecting common barriers in low-resource settings such as limited screening programs, low awareness, and delayed access to care.³⁶⁻³⁸

This study offers valuable insight into the epidemioclinical profile of breast cancer in women under 35 in a low-resource setting, addressing a largely understudied population. Its strengths include a decade-long retrospective design, clearly defined inclusion criteria, and comprehensive clinical and pathological data.

The interpretive power of this study is limited by the small sample size, high proportion of missing immunohistochemical and staging data, and the absence of survival or treatment outcome metrics. The retrospective, single-center design also introduces potential selection bias, and the lack of a comparative age group restricts broader generalizability. Despite these limitations, the findings underscore urgent diagnostic and resource gaps and lay the groundwork for targeted public health interventions.

CONCLUSION

Although breast cancer predominantly affects older women, its occurrence in those under 35 represents an increasingly recognized clinical and public health concern particularly in low-resource settings such as Madagascar, where data remain scarce. This study provides a focused overview of the epidemiological and clinicopathological features of breast cancer in young women managed at the oncology and palliative care unit of Soavinandriana Hospital.

Among 2,087 breast cancer cases recorded over a decade, only 38 (1.82%) occurred in women under 35, with the majority aged 30 to 34 years. Most patients presented with palpable masses, predominantly located in the upper outer quadrant. Invasive carcinoma of no special type was the most frequent histologic subtype, and the predominance of SBR grade II and III tumors suggests a biologically aggressive phenotype. Notably, over half of the patients were diagnosed at stage IIB or higher. The frequent

absence of immunohistochemical and staging data reflects persistent diagnostic limitations.

These findings underscore the urgent need for context-specific interventions, including awareness campaigns on early warning signs and breast self-examination, enhanced clinical training, and improved access to diagnostic modalities such as imaging and immunohistochemistry. Incorporating systematic assessment of family history and tumor subtypes could support more personalized risk-based screening strategies.

The establishment of a national cancer registry, integrating both clinical and molecular data, is essential to guide health policy. Genomic studies tailored to the Malagasy population may offer valuable insights for targeted therapies. Initiating clinical breast screening as early as age 25 in high-risk regions should also be explored. A deeper understanding of breast cancer in young Malagasy women is critical to advancing timely diagnosis, equitable care, and improved outcomes.

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