#2411: Sociodemographic and Clinical Factors Associated with Late-Stage Breast Cancer in Young Brazilian Women: A 24-Year Nationwide Study of 52,734 Patients

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Introduction

Cancer in adolescents and young adults (AYAs), aged 15 to 39 years, constitutes a major global health challenge, with over 1.2 million new cases diagnosed each year. The rising incidence is not the only reason for warrant of breast cancer in young women (BCYW), but also because of its specificities. Younger patients are not included in routine screening, have lower symptom awareness, and delays in diagnostic evaluation, so commonly present with advanced-stage disease at diagnosis. Furthermore, multiple studies have demonstrated that BCYW frequently exhibit more aggressive tumor biology and consequently face poorer clinical outcomes.

Objective

Estimate the frequency and identify sociodemographic and clinical factors associated with late-stage breast cancer (stage III or IV BC) at diagnosis among young women treated in the Brazilian public health system (SUS).

Methods and Materials

Secondary data collected within Brazil's public healthcare system, as recorded in the national Hospital Cancer Registry, including women aged 15 to 39 years diagnosed with BC (ICD-10 C50), between 2000 and 2023. The primary end point was late-stage diagnosis, established as clinical stage III or IV (8th AJCC) at presentation. Multivariable logistic regression using the Stepwise Forward method was applied to identify association with the outcome.

Results

Among the 52,734 eligible patients, 0.1% were aged 15–19 years (n=39), 12.2% were aged 20–29 years (n = 6,431), and 87.7% were aged 30–39 years (n=46,264), with a median age at diagnosis of 35 years (SD ±3.93). The majority self-identified as Black or mixed-race (55.3%), 54.3% reported being in a partnered relationship, and 59.5% had ≥9 years of formal education. Half of the cases were reported from the Southeast region (50.7%). At the time of diagnosis, 8.4% of patients reported alcohol consumption and 6.1% were current smokers. The predominant histological subtype was invasive carcinoma of no special type (80.6%). Most patients (78.7%) were referred for treatment via the public healthcare system.

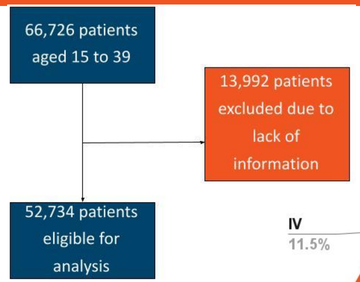
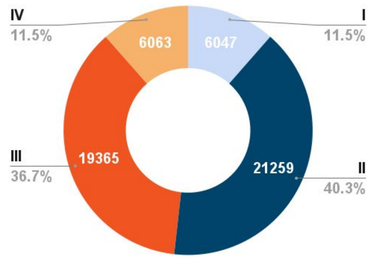


Figure 1. Flowchart eligibility

Figure 2. Clinical stage at diagnosis



In multivariable logistic regression analysis, independent factors associated with late-stage diagnosis included younger age (OR 0.97; 95% CI, 0.96–0.98; p < 0.001), Black or mixed-race ethnicity (OR 1.34; 95% CI, 1.24–1.42; p < 0.001), lower educational attainment (OR 1.27; 95% CI, 1.20–1.34; p < 0.001), unpartnered status (OR 1.12; 95% CI, 1.06–1.18; p < 0.001), invasive carcinoma of no special type (OR 1.62; 95% CI, 1.48–1.76; p < 0.001), and referral through the public health system (OR 1.34; 95% CI, 1.25–1.43; p < 0.001). Alcohol consumption, tobacco use, and geographic macro-region were not significantly associated with stage at diagnosis.

Discussion

This nationwide study, one of the largest cohorts within this specific population ever reported from a middle-income country, demonstrated a persistently high burden of late-stage disease at diagnosis, with 48.2% of patients presenting with stage III–IV tumors. These findings reinforce previous Brazilian evidence showing delayed diagnosis in this population. These patterns are consistent with global data from other middle-income countries. An Indian cohort that included 1,228 young patients with a median age of 36 years, 53.7% presented with stage III disease, while a Mexican study reported 48% stage III among young patients, a median age of 35 years (range, 21–40 years), at presentation.[1,2]

Table 1. Frequency of demographic and clinical variables and association with late clinical stage (n=52,734)

Variables	Total	Early Stage (I-II) (n=27,306)	Late Stage (III-IV) (n=25,428)	OR (95% CI)	P value
Age (years)					
Median	35 (15–39)	36 (15–39)	35 (15–39)	0.97 (0.96–0.97)	<0.001
Age group					
30 to 39 years	46,264 (87.7)	24,351 (89.2)	21,913 (86.2)	Reference	<0.001
15 to 29 years	6,470 (12.3)	2,955 (10.8)	3,515 (13.8)	1.32 (1.25–1.39)	
Race					
White/Other	14,829 (44.7)	8,144 (49.1)	6,685 (40.3)	Reference	<0.001
Black or Mixed	18,359 (55.3)	8,438 (50.9)	9,921 (59.7)	1.43 (1.37–1.50)	
Educational					
≥ 9 years of study	24,877 (59.5)	13,526 (62.7)	11,351 (56.0)	Reference	<0.001
≤ 8 years of study	16,964 (40.5)	8,044 (37.3)	8,920 (44.0)	1.32 (1.27–1.37)	
Marital status					
With partner	17,301 (54.3)	8,886 (56.2)	8,415 (52.5)	Reference	<0.001
Without partner	14,557 (45.7)	6,936 (43.8)	7,621 (47.5)	1.16 (1.11–1.21)	
Alcohol					
No	48.290 (91,6)	25.115 (92,0)	23.175 (91,1)	Reference	
Yes*	4.444 (8,4)	2.191 (8,0)	2.253 (8,9)	1,11 (1,05 – 1,18)	1
Smoke					
No	49.533 (93,9)	25.704 (94,1)	23.829 (93,7)	Reference	
Yes*	3.201 (6,1)	1.602 (5,9)	1.599 (6,3)	1,08 (1,00 – 1,16)	43
Region					
South and Southeast	35.329 (67,2)	19.136 (70,4)	16.193 (63,9)	Reference	
North, Northeast, Center-West	17.210 (32,8)	8.056 (29,6)	9.154 (36,1)	1,34 (1,29 – 1,39)	<0,001
Referral source					
Private service	6.642 (21,3)	3.831 (24,8)	2.811 (17,9)	Reference	
Public Health System (SUS)	24.480 (78,7)	11.608 (75,2)	12.872 (82,1)	1,51 (1,43 – 1,60)	<0,001
Histological type					
Others	6.105 (12,6)	3.950 (15,6)	2.155 (9,2)	Reference	
NST	42.496 (87,4)	21.295 (84,4)	21.201 (90,8)	1,82 (1,73 – 1,93)	<0,001

Table 2. Independent factors associated with late-stage breast cancer

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Variables	OR Adjusted (IC 95%)	P value
Age		
Median	0,97 (0,96 – 0,98)	<0,001
Skin color		
Others	Reference	<0,001
Black or brown	1,34 (1,27 – 1,42)	
Education		
≥ 9 years of study	Reference	<0,001
Up to 8 years of study	1,27 (1,20 – 1,34)	
Marital status		
With partner	Reference	<0,001
Without partner	1,12 (1,06 – 1,18)	
Referral source		
Private	Reference	<0,001
Public Health System (SUS)	1,34 (1,25 – 1,43)	
Histological type		
Others	Reference	<0,001
No Special Type (NST)	1,62 (1,48 – 1,76)	

Limitations

The real-world analysis and retrospective nature of this study are subject to inherent limitations. The use of secondary data from a continental country may lead to underreporting or omission of relevant variables, as well as potential stage misclassification across different TNM editions.

Conclusions

Late-stage breast cancer remains the most common presentation among young women in Brazil. Low educational level, referral to the public health system, and racial inequalities are independent predictors of advanced-stage presentation. Reducing diagnostic delays in this population has substantial potential to increase life years saved and improve equity in cancer care, ensuring that youth is no longer synonymous with late diagnosis in Brazil.

Contact

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