Pathological Complete Response and Breast-Conserving Surgery after Neoadjuvant Chemotherapy in an Institution fully Funded by the Brazilian Public Health System in Bahia, Brazil

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Introduction

Breast cancer (BC) incidence has increased in developing countries, showing high mortality rates despite lower incidence compared to developed nations.[1] In 2023, 73.610 new BC cases were reported in Brazil, with 80% of patients relying solely on the Brazilian public health system (SUS) for treatment.[2] Limited early detection in primary care contribute to 40% of cases being diagnosed at advanced stages.[3] The prevalence of aggressive subtypes such as triple-negative (TN) and HER2+ (HER2) differ between regions in the country.[4] The state of Bahia has a predominantly Black/mixed-race population (81%), however, data on tumor subtype distribution and neoadjuvant treatment outcomes are scarce.[5] The purpose of this series is to evaluate pathological complete response (pCR) rates in the breast and axilla, following neoadjuvant chemotherapy (NACT) in BC patients treated at an institution fully funded by SUS in Bahia. Secondary objectives included assessing pCR rates by tumor subtype and breast-conserving surgery (BCS) rates.

Methods and Materials

This case series study included 286 women who underwent surgery after NACT between Jan/2018 and Dec/2021. Patients with multifocal/multicentric tumors, bilateral BC, metastasis, or who received NACT in other units were excluded. Tumors were categorized into molecular subtypes (luminal, TN, HER2/HR+, HER2/HR−). Use of trastuzumab with number of doses were documented for HER2 cases. Surgeries were classified as BCS or mastectomy. pCR was defined as the absence of invasive disease in the breast and axilla .

Results

Mean age was 51 ± 12 years. Most patients (66%) had locally advanced disease, and 82% self-identified as Black or mixed-race. Tumor subtypes: luminal 41%, TN 31%, HER2/HR+ 13%, and HER2/HR− 15%. TN was more frequent among mixed-race women (36%), and HER2 tumors were more common in Black women (33%). Overall, 93% received ACT-based chemo. Among HER2 cases, 63% received trastuzumab, but only 32% completed ≥4 doses during the neoadjuvant phase. Overall pCR was 22%. By subtype: HER2/HR− 49%, TN 26%, HER2/HR+ 25%, luminal 8%. By race: Black 27%, mixed-race 20%, White 17%. BCS was performed in 36%. In non-inflammatory cases, 42% underwent conservative surgery.

Table 1. pCR[1] in 286 patients treated with NACT[2] for breast cancer, according to clinicopathological characteristics. Bahia, 2018–2021.

	pCR	(%)	Total	p-value
Total Patients	63	(22)	286	
Age Groups (years)				
< 40 years	11	(22)	50	0,32
40-49 years	16	(20)	82	
50-59 years	25	(28)	88	
> = 60 years	11	(17)	66	
Race				
White	9	(17)	52	0,317
Black	30	(27)	113	
Mixed-race	24	(20)	120	
Indigenous	0	(0)	1	
Molecular Subtype (n = 285)				
Luminal	10	(8)	118	$<10^{-5}$
Triple Negative	23	(26)	88	
HER2	30	(38)	79	
HER2/RH +	9	(25)	36	0,03
HER2/ RH –	21	(49)	43	

[1] Pathological complete response; [2] Neoadjuvant chemotherapy

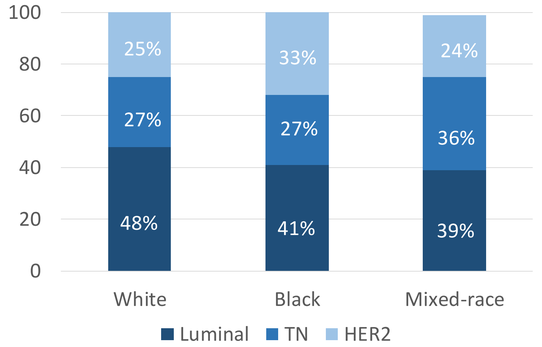


Chart 1. Distribution of molecular subtypes according to self-declared race.

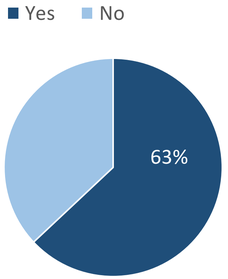


Chart 2. Access to trastuzumab in the HER2 positive subgroup (n=79) during neoadjuvant chemotherapy .

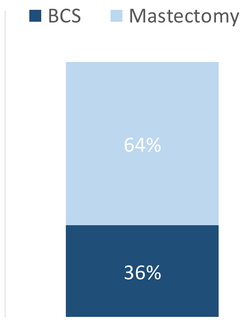


Chart 3 . Breast surgical procedures performed after neoadjuvant chemotherapy.

Discussion

To our knowledge, this is the first study to assess pCR in a predominantly Black/mixed-race population in Brazil. The high prevalence of aggressive tumor subtypes and advanced-stage diagnoses likely influenced the pCR and surgery outcomes. Despite the recommendation for trastuzumab use since 2012, access remains limited and inconsistent in the SUS.[6] Only 63% of HER2 positive patients received trastuzumab, and just 32% completed the four recommended doses during the neoadjuvant phase. Platinum-based regimens were rarely used, being reserved for patients with disease progression. The overall pCR rate was 22%, consistent with results reported in the pre–dual-blockade and pre-immunotherapy era. However, pCR rates by subtype were lower compared to international studies, , reflecting disparities in access to targeted therapies.[7,8] Higher pCR among Black/mixed-race women is likely linked to the greater frequency of responsive subtypes. BCS occurred in 42% of non-inflammatory breast cancer cases, lower than international figures.[9] Oncoplastic techniques helped expand BCS eligibility, especially in cT3 and luminal tumors.

Conclusions

This study provides important insight into breast cancer treatment outcomes in an institution served exclusively by SUS in Brazil in a region with a predominantly Black/mixed-race population. The findings emphasize the urgent need for public health strategies that ensure earlier diagnosis and improve equitable access to targeted therapies, aiming to reduce disparities and improve outcomes for underserved populations.

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