

# Characteristics and prognosis of male breast cancer in Brazil: A cohort study

Luiz Claudio Santos Thuler PhD  | Suzana Sales de Aguiar MSc | Davy Rapozo PhD |  
Marcelo Adeodato Bello PhD | Anke Bergmann PhD 

Brazilian National Cancer Institute (INCA), Rio de Janeiro, Brazil

**Correspondence:** Luiz Claudio Santos Thuler, Clinical Research Division, Brazilian National Cancer Institute (INCA). Rua André Cavalcanti, 37 - Rio de Janeiro, RJ, Brazil.

Email: lthuler@gmail.com

Male breast cancer (MBC) is an uncommon disease. In Brazil, in the 2000s, 1.38% of all breast cancer (BC) diagnoses and 0.97% of BC deaths were in men.<sup>1</sup> Despite the important biological differences between female and MBC, survival rates were not different between sexes.<sup>2,3</sup> The understanding of the disease is still insufficient, and MBC can be considered a neglected disease.<sup>4</sup>

The aim of this study was to describe the experience of the Brazilian National Cancer Institute (INCA) concerning the biomarker expression of estrogen (ER), progesterone (PR), and human epidermal growth factor receptor-type 2 (HER2) receptors and Ki67 characteristics in MBC.

A total of 65 MBC diagnosed between 1999 and 2013 were enrolled into this retrospective cohort study. Tumor samples were reviewed, and immunohistochemistry analyses were performed

blinded to the clinical data. This study was approved by the Institutional Ethics in Human Research Committee.

The main patient characteristics and overall survival (OS) are shown in Table 1 and Figure 1. No triple-negative cases were detected. Mean follow-up was 6 years (range 3 months-15 years).

In studies performed abroad, the 5-year OS of patients with MBC range from 70.6%<sup>5</sup> to 79.1%.<sup>6</sup> These values are much higher than those observed in the present study (55.8%). At the other extreme, a study in Burkina Faso, Africa, showed a 5-year OS of 49%.<sup>7</sup>

In this study, advanced clinical stage at diagnosis, negative PR and/or negative ER and receiving no oncological treatment were independently associated with OS (Table 2). Similarly, Leone et al<sup>5</sup> found that advanced clinical stage, histological grades III or IV, no treatment with surgery or radiotherapy, and ER-negative tumors

**TABLE 1** Descriptive characteristics and overall survival of patients with male breast cancer

Variables	N (% <sup>a</sup> )	5-y survival % ( $\pm$ SD)	Median survival Years (95% CI)	P-value
Time period				.795
1999-2003	21 (32.3)	45.0 (11.7)	4.8 (2.0-7.6)	
2004-2008	28 (43.1)	52.6 (9.6)	6.8 (0.2-13.3)	
2009-2013	16 (24.6)	73.7 (11.3)	6.8 (4.4-9.2)	
Age at diagnosis				.262
$\geq$ 65 y	29 (44.6)	49.4 ( $\pm$ 10.0)	4.0 (1.8-8.0)	
<65 y	36 (55.4)	60.3 ( $\pm$ 8.3)	8.6 (4.4-12.8)	
BMI				.186
<25	18 (41.9)	59.3 ( $\pm$ 11.9)	6.2 (3.2-9.1)	
$\geq$ 25	25 (58.1)	72.0 ( $\pm$ 9.0)	10.1 (7.8-12.3)	

(Continues)

TABLE 1 (Continued)

Variables	N (% <sup>a</sup> )	5-y survival % ( $\pm$ SD)	Median survival Years (95% CI)	P-value
<b>Race/ethnicity</b>				
White	34 (61.8)	63.2 ( $\pm$ 8.5)	8.6 (6.6-10.7)	.945
Nonwhite	21 (38.2)	59.4 ( $\pm$ 11.2)	6.2 (0.6-11.8)	
<b>Histology</b>				
Invasive ductal carcinoma	56 (86.2)	52.1 ( $\pm$ 7.0)	6.1 (1.6-10.7)	.220
Others <sup>b</sup>	9 (13.8)	77.8 ( $\pm$ 13.9)	6.8 (NA)	
<b>Nuclear grade</b>				
III	19 (36.5)	56.1 ( $\pm$ 11.7)	6.2 (3.3-9.1)	.711
I/II	33 (63.5)	57.2 ( $\pm$ 9.0)	8.6 (3.4-13.8)	
<b>Extent of the tumor</b>				
T0/T1	11 (20.4)	72.7 ( $\pm$ 13.4)	11.8 (6.8-16.7)	.190
T2	20 (37.0)	52.9 ( $\pm$ 11.4)	6.1 (3.1-9.1)	
T3	5 (9.3)	80.0 ( $\pm$ 17.9)	10.1 (3.5-16.6)	
T4	18 (33.3)	39.7 ( $\pm$ 12.3)	4.2 (1.7-6.7)	
<b>Lymph nodal involvement</b>				
N0	22 (36.7)	81.1 ( $\pm$ 8.5)	11.8 (8.2-15.5)	.002
N1	33 (55.0)	41.1 ( $\pm$ 9.0)	4.6 (2.3-6.8)	
N2	5 (8.3)	40.0 ( $\pm$ 21.9)	4.1 (0-10.6)	
<b>Metastases</b>				
M0	52 (82.5)	63.7 ( $\pm$ 6.8)	8.4 (5.1-11.8)	.002
M1	11 (17.5)	21.2 ( $\pm$ 13.2)	3.8 (0-7.7)	
<b>Clinical stage</b>				
Advanced ( $\geq$ 2B)	44 (68.8)	44.8 ( $\pm$ 7.8)	4.2 (3.0-5.4)	<.001
Initial (<2B)	20 (31.3)	78.9 ( $\pm$ 9.4)	Not Reached	
<b>Estrogen receptor</b>				
Negative (<1%)	2 (3.1)	100	Not Reached	0.604
Positive ( $\geq$ 1%)	63 (96.9)	54.3 ( $\pm$ 6.5)	6.8 (2.8-10.7)	
<b>Progesterone receptor</b>				
Negative (<1%)	7 (10.8)	28.6 ( $\pm$ 17.1)	3.0 (2.6-3.3)	.068
Positive ( $\geq$ 1%)	58 (89.2)	59.5 ( $\pm$ 6.7)	8.4 (5.5-11.3)	
<b>Estrogen or progesterone receptor</b>				
One or both negative	9 (13.8)	44.4 ( $\pm$ 16.6)	3.4 (2.2-4.7)	.065
Both positive	56 (86.2)	57.9 (6.9)	8.6 (5.1-12.1)	
<b>HER2</b>				
Negative	55 (84.6)	58.7 ( $\pm$ 6.9)	8.0 (5.2-10.8)	.248
Positive	10 (15.4)	40.0 ( $\pm$ 15.5)	2.2 (0.2-4.2)	
<b>Ki67</b>				
Negative (<14%)	63 (96.9)	56.0 ( $\pm$ 6.5)	6.8 (3.0-10.5)	.419
Positive ( $\geq$ 14%)	2 (3.1)	50.0 ( $\pm$ 35.4)	0.9 (NA)	
<b>Surgery</b>				
Yes	51 (78.5)	68.3 ( $\pm$ 6.8)	9.4 (7.0-11.8)	<.001
No	14 (21.5)	08.9 ( $\pm$ 8.4)	1.1 (0.6-1.6)	

(Continues)

TABLE 1 (Continued)

Variables	N (% <sup>a</sup> )	5-y survival % ( $\pm$ SD)	Median survival Years (95% CI)	P-value
Axillary approach <sup>c</sup>				.798
Yes	49 (96.1)	69.2 ( $\pm$ 6.9)	9.4 (7.3-11.5)	
No	2 (3.9)	50.0 ( $\pm$ 35.4)	4.2 (NA)	
Lymph node status				.986
Positive	29 (60.4)	70.8 ( $\pm$ 8.7)	8.6 (6.0-11.3)	
Negative	19 (39.6)	70.6 ( $\pm$ 11.1)	10.1 (5.4-14.7)	
Any oncological treatment				<.001
Yes <sup>d</sup>	54 (83.1)	66.4 ( $\pm$ 6.7)	8.6 (6.3-11.0)	
No	11 (16.9)	0	1.3 (0-2.6)	
Chemotherapy				.003
Yes	33 (50.8)	77.6 ( $\pm$ 7.5)	10.1 (7.0-13.1)	
No	32 (49.2)	32.4 ( $\pm$ 8.8)	4.1 (2.3-5.9)	
Radiotherapy				.465
Yes	24 (36.9)	68.5 ( $\pm$ 9.9)	6.8 (4.2-9.3)	
No	41 (63.1)	48.4 ( $\pm$ 8.1)	4.9 (0-10.6)	
Hormonal therapy				.006
No	28 (43.1)	33.6 ( $\pm$ 9.5)	4.0 (2.4-5.5)	
Yes	37 (56.9)	71.7 ( $\pm$ 7.6)	9.8 (6.7-13.0)	
Total	65 (100.0)	55.8 (6.4)	6.8 (2.9-10.6)	---

Abbreviations: BMI, body mass index; HER2, human epidermal growth factor receptor 2; NA, not available; SD, standard deviation.

<sup>a</sup>Percentages were calculated based on valid data.

<sup>b</sup>Papillary carcinoma = 5 (7.7%); Ductal carcinoma in situ = 2 (3.1%); Adenoid cystic carcinoma = 1 (1.5%); Mucinous carcinoma = 1 (1.5%).

<sup>c</sup>Only surgical patients (n = 51): Sentinel lymph node biopsy/lymphadenectomy

<sup>d</sup>Surgery, Chemotherapy, Radiotherapy or Hormonal therapy.

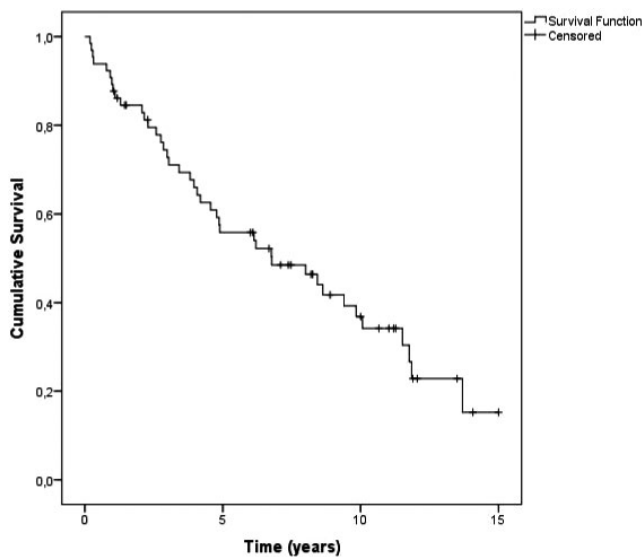


FIGURE 1 Overall survival of patients with male breast cancer

have a significant lower OS. Another study<sup>8</sup> established that only hormone negative receptors (ER, PR, and androgen receptor) have

TABLE 2 Independent factors associated with overall survival in patients with male breast cancer

Variables	<sup>a</sup> HR <sup>a</sup>	95% CI	P-value
No oncological treatment	8.9	3.4-22.9	<.001
Clinical stage $\geq$ 2B	3.1	1.2-7.7	.015
Negative progesterone or estrogen receptor	2.7	1.1-6.5	.024

Abbreviations: CI, Confidence interval; <sup>a</sup>HR, Adjusted hazard ratio.

<sup>a</sup>Adjusted by age (continuous).

influenced negative survival of MBC. In contrast, age<sup>6</sup> has no prognostic hole in the present cohort.

Efforts to improve the prognosis of patients with MBC should be geared toward achieving early diagnosis, assessing hormone receptor status, and offering an individualized treatment.

#### ORCID

Luiz Claudio Santos Thuler  <https://orcid.org/0000-0003-2550-6537>

Anke Bergmann  <https://orcid.org/0000-0002-1972-8777>

Anke Bergmann  <https://orcid.org/0000-0002-1972-8777>

## REFERENCES

1. Thuler LC, Bergmann A. Male breast cancer: clinical-epidemiological characteristics of 1189 Brazilian patients. *Aging Male*. 2015;18(2):118-123.
2. Bender PFM, de Oliveira LL, Costa CR, et al. Men and women show similar survival rates after breast cancer. *J Cancer Res Clin Oncol*. 2017;143(4):563-571.
3. Thuler LCS, Bergmann A, Bender PFM, et al. Response to "Men and women show similar survival rates after breast cancer", Yin Pan, Ze-Zhou Song. *J Cancer Res Clin Oncol*. 2017;143(8):1623-1625.
4. Fentiman IS. Male breast cancer: a neglected disease. *Breast Cancer Management*. 2020;8(4):BMT32.
5. Leone JP, Zwenger AO, Iturbe J, et al. Prognostic factors in male breast cancer: a population-based study. *Breast Cancer Res Treat*. 2016;156(3):539-548.
6. Yadav S, Karam D, Bin Riaz I, et al. Male breast cancer in the United States: treatment patterns and prognostic factors in the 21st century. *Cancer*. 2020;126(1):26-36.
7. Zongo N, Ouédraogo S, Korsaga-Somé N, et al. Male breast cancer: diagnosis stages, treatment and survival in a country with limited resources (Burkina Faso). *World J Surg Oncol*. 2018;16(1):4.
8. Cardoso F, Bartlett JMS, Slaets L, et al. Characterization of male breast cancer: results of the EORTC 10085/TBCRC/BIG/NABCG International Male Breast Cancer Program. *Ann Oncol*. 2018;29(2):405-417.