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Molecular subtype as prognostic factor of breast cancer in women users' public health system of São Paulo, Brazil.

Stela Verzinhasse Peres[a]; Paola Engelmann Arantes[b]; Marcela de Araújo Fagundes[c] ; Beatriz Cordeiro Jardim[d]; Alexandre Muxfeldt Ab'Saber[a,e] ; Daniel Luiz Gimenes[f] ; Maria Paula Curado[c] ; René Aloisio da Costa Vieira[g] .

a – Oncocenter Foundation of São Paulo - Department of Information and Epidemiology, Brazil; b – Brazilian Clinical Research Institute, Brazil; c - Group of Epidemiology and Statistics on Cancer, International Research Center, A.C. Camargo Cancer Center, Brazil; d – Instituto Nacional de Câncer José Alencar Gomes da Silva (INCA), Brazil; e – Department of Pathology - Clinical Hospital, University of São Paulo (FMUSP), Brazil; f – Oncoclinics Group of São Paulo – Department of Mastology, Brazil; g – Programa de Pós Graduação em Tocoginecologia da Faculdade de Medicina de Botucatu Universidade Estadual Paulista (UNESP) – Programa de Pós-graduação em Oncologia Hospital do Câncer de Barretos (Hospital de Amor), Brazil.

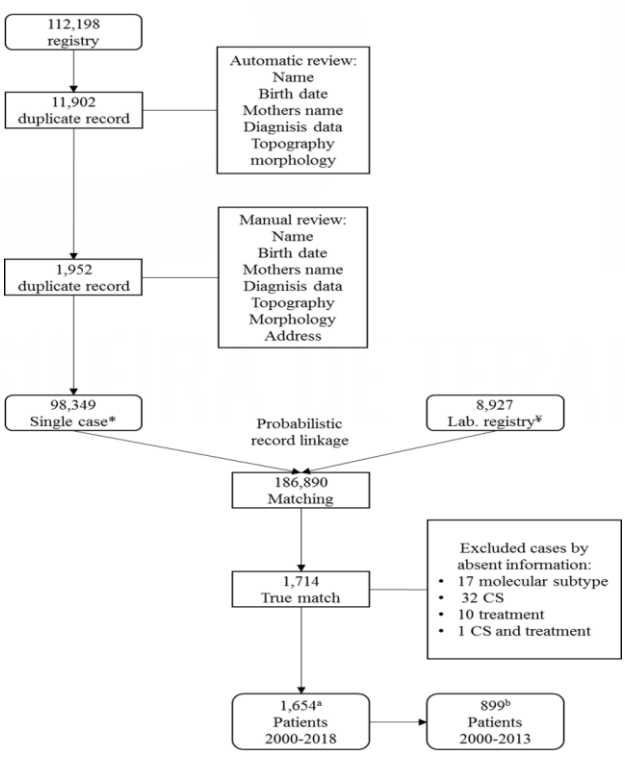
Introduction

In Brazil, for each year of the 2020–2022 triennium, 66,280 new cases of breast cancer in women are expected, which corresponds to an estimated risk of 6,161 new cases per 100,000 women. In 2019, 18,068 women died from breast cancer, representing 16.4% of all cancer-related deaths in women. Limited Brazilian studies have evaluated the link between molecular subtypes and prognoses in breast cancer patients, and only one of these studies enrolled over nine hundred patients. The aim of this study was to analyse the prognosis of women with breast cancer according to the molecular subtypes of their cancer, sociodemographic variables, and clinical and treatment characteristics using Sao Paulo's hospital-based cancer registry in Brazil (FOSP/SP).

Methods

In this retrospective study, we collected data on a hospital-based cohort of 1,654 women aged 18 years or above diagnosed with invasive breast cancer (CID-O 50.0 a C50.9) between 2000 and 2018. The data were obtained from São Paulo's hospital-based cancer registry (RHC/SP) and the Immunohistochemistry Laboratory database, both based at the Oncocenter Foundation of São Paulo (FOSP). Only patients who had not received prior treatment were eligible. Patients with incomplete or missing biomarker (RE, RP, HER), clinical staging (CS) and postdiagnosis treatment data were excluded. The variables collected were age, histology, molecular subtype, clinical staging at diagnosis and treatment type. For the 5-year survival rate analysis, a Kaplan-Meier test and Cox regression analysis were applied to estimate death risk. This study was authorized by the Ethics Committee in Research of the Municipal Maternity-School Hospital Dr. Mário de Moraes Altenfelder Silva, protocol nº 4.106.934.

Figure 1 – Flowchart according to selection of the patients and linkage process. FOSP 2000-2018.



Results

Of the 1,654 women with invasive breast cancer, the average age was 56.8 (SD=13.2), with a median of 56, varying between 22 and 96 years. Regarding the molecular subtypes, the luminal B/Her2- phenotype was the most frequent (41.2%). The analysis of the distribution of demographic and clinical variables by molecular subtype revealed a higher frequency of the triple-negative phenotype among patients under 40 years of age (15.2%). There was a biological gradient in the molecular subtype variable, in which the risk of death was increased in patients with some clinicopathological compositions. For triple-negative patients, the worst 5-year OS rate was seen in women <40 years of age (38.3%) and in those ≥70 years of age (45%). Women who presented with molecular subtype luminal B tumours (Her-2+) had a risk of death of HR_{adj}=2.30 (95% CI 1.27 – 4.17), those with Her-2+ *(nonluminal)* of HR_{adj}=2.39 (95% CI 1.42 – 4.02) and those with triple-negative tumours of HR_{adj}=2.65 (95% CI 1.72 – 4.08).

Table 1 – Prognostic factors for the risk of death in women with invasive breast cancer. RHC/SP-FOSP 2000-2013.

Variable	Category	HR_{adj}*	95% CI		p
			Lower	Upper	
Molecular Subtype	Luminal A	Ref			
	Luminal B (HER2 negative)	1.40	0.96	2.05	0.084
	Luminal B (HER2 positive)	2.30	1.27	4.17	0.006
	HER2 positive (non luminal)	2.39	1.42	4.02	0.001
	Triple-negative	2.65	1.72	4.08	<0.001
EC at diagnosis	I	Ref			
	II	1.40	0.81	2.40	0.244
	III	2.82	1.65	4.83	<0.001
	IV	10.47	5.89	18.61	<0.001
Treatment	Chemotherapy	Ref			
	Surgery/CTX	0.88	0.51	1.53	0.646
	Surgery/RTX/CTX	0.51	0.31	0.85	0.009
	Surgery/RTX/CTX/HT	0.41	0.26	0.64	<0.001

* adjusted by age and histology

Conclusion

The molecular subtype is an independent risk factor for death among Brazilian women cohort in public health system depending on several epidemiological characteristics; those with Her-2-positive (*nonluminal*) and triple-negative tumours have the worst prognoses. These findings will facilitate the comparison of prognostic factors and epidemiological characteristics between heterogeneous populations, such as Brazilian and Latin American women, with other populations.

Email address:svperes80@gmail.com