Overview of female breast cancer in northern Tocantins – Brazil

Panorama do câncer de mama em mulheres no norte do Tocantins – Brasil

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A B S T R A C T

Objective: to evaluate the temporal variation of the percentages of female breast cancer in early and late stages and analyze socio-demographic variables associated with these stages. **Methods**: study of secondary data performed between the years of 2000 and 2015 in the Araguaína Regional Hospital - Araguaína - TO – Brasil. **Results**: breast cancer in advanced stages were diagnosed in 51.1% of the cases and at an early stage in 48.9%. There was no difference between the percentages of patients with early and late stages over the years. Women of race/black, illiterate and origin of the southeast of Pará presented a higher percentage of late staging at diagnosis. **Conclusions**: most women was diagnosed with advanced disease; the time evolution of the proportion of cases (advanced/early) did not demonstrate variational changes over the years; association of the disease has been identified in advanced stage in women of race/black, illiterate and from the southeast of Pará state.

Keywords: Breast Neoplasms. Epidemiology, Descriptive. Neoplasm Staging. Delayed Diagnosis.

INTRODUCTION

Breast cancer is one of the non-transmissible diseases with challenging characteristics of the world population, that is changing demographically, nutritionally and socially[1]. This public health scenario is worse in locals with bad health care[2]. Global statistics show that almost 60% of deaths related to breast cancer are observed in developing countries[3]. This is explained by the precarious health system of these countries, where patients have limited access to early diagnosis and without efficient treatment[4]. Thus, even with the great progress of early detection and treatment of breast cancer over the last years, this disease still imposes an onus to World population due to its progressive incidence and epidemiologic complexity[4]. In this context, epidemiologic analysis according to specific regions are essential for the development of individual health actions.

The objectives of the present work were to evaluate the temporal variation of percentage of breast cancer in women, categorized as early stage or late stage, related to socio-demographic aspects, at the first consultant at Araguaína Regional Hospital TO, Brazil (HRA/TO).

METHODS

This is an analytical study of secondary data of the program sis-RHC of the Hospital Regional de Araguaína, TO, Brazil (HRA/TO), of women with breast cancer from January 2000 to December 2015. Clinical staging used the system proposed by International Union against Cancer[5]. Later, these data were grouped in two groups for analysis: early stage disease (0, I and II) and late stage (III and IV).

Socio-demographic variations were described according to categories proposed by the National Institute of Cancer of Brazil, using the sheet for tumor registry[6,7], that includes: age, race/color of the skin, schooling, marital status, origin, alcohol abuse, smoking and referral center.

For analysis, it was used the statistics software SPSS version 20.0. To verify association between two categories variables it was used Chi-square test, or, alternatively for small samples, Fisher exact test. When distribution differences were detected, it was used adjusted standardized residual to identify local differences (*casellas*): absolute values above 1.96 indicated association (local) between categories related

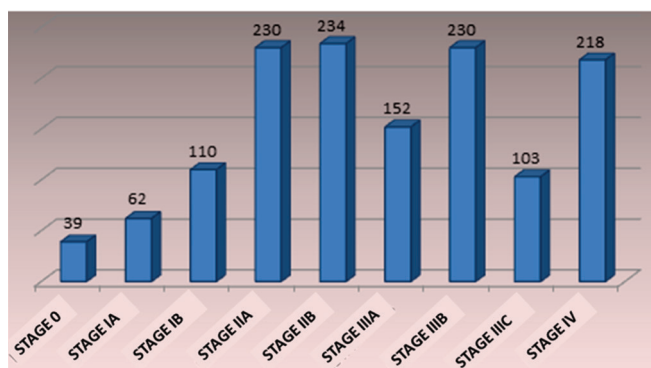**Figure 1.** *Breast cancer stage in HRA from 2000 to 2015.*

Figure 2. *Grouping of breast cancer at HRA from 2000 to 2015.*

to those *casellas*. Comparison of media between both groups were made by t Student test for independent samples. For comparison of more than two groups, it was used the non-parametric Kruskal-Wallis test in view of the violation of the assumption of normality of data necessary for ANOVA (analysis of variance). When media differences were identified, their analysis was performed by Dunn-Bonferroni multiple comparison. For all statistical tests, it was used a significant level of 5%. This study was registered at *Plataforma Brasil* and was analyzed by the Research Ethical Committee # 639460.

RESULTS

In the studied period (2000 to 2015), 1409 analytical and non-analytical women with breast cancer were registered at Sis-RHC/HRA. At first consultation, the most frequent stages were: IIA, IIB, IIIB and IV (Figure 1). In consequence, the more frequent stage group of women with breast cancer at HRA was stage III, followed by stage II, 35.2% and 33.7%, respectively (Figure 2). When stages 0,I and II were grouped as early stages, and II and IV as late stages, it was observed that 51.8% of patients were diagnosed with late disease, while 48.25 with early tumor at diagnosis over the studied years (Figure 3). Evolutionary analysis of breast cancer stages did not show any significant difference of percentage proportions (p=0.757) between early and late stages at diagnosis over the studied years (Figure 4).

Of the total of 1409 women, only 2.2% (28 patients) had no information about stage at the register, and the same was observed among some
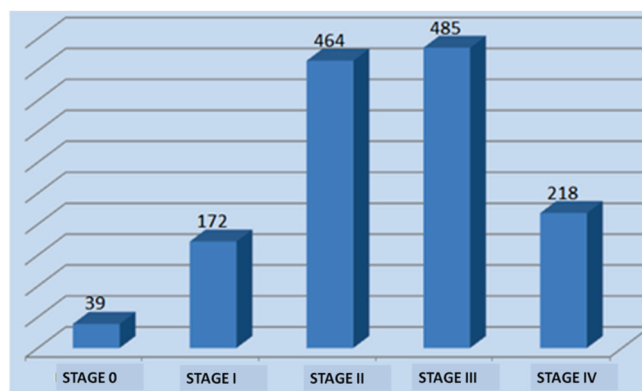
demographic and social variables. Thus, the analysis of correlation of socio-demographic variables and stage (early or late) shows distinct quantity of registers. Women with race/black color (p=0.012), illiterate (p=0.003) and from southeast of Para state showed higher percentage of late stage. On the other hand, white women, with higher education, from other regions, showed higher percentage of early diagnosis. Other variables such as age range, referral center, marital status, family history, alcohol abuse and smoking did not show any association with early or late stage of the disease (Table 1).

DISCUSSION

This analysis highlighted some epidemiologic characteristics of women with breast cancer at the High Complexity Oncology Unit at Araguaína – TO, Brazil, over 16 years (2000 to 2015). It is important to stress that the Araguaina Regional Hospital is a referral center for oncology at the state of Tocantins, southeast of Para state and south of Maranhão state. Also, HRA had available only one public service of radiotherapy in the state until 2015.

Considering possible limitations of this work, during the studied period, the percentage of women with breast cancer in late stages in this region of the country is elevated (around 50% of patients). Similar results or even worse were found in Indian women and from Sub-Saharan Africa. In those countries, 70 to 90% of patients are diagnosed with stages III and IV[8,9]. In many parts of the planet, high percentages of breast cancer
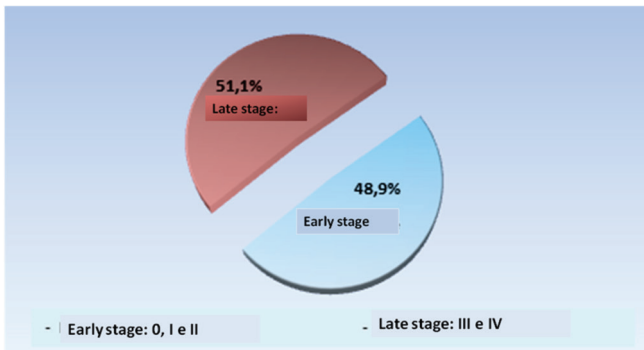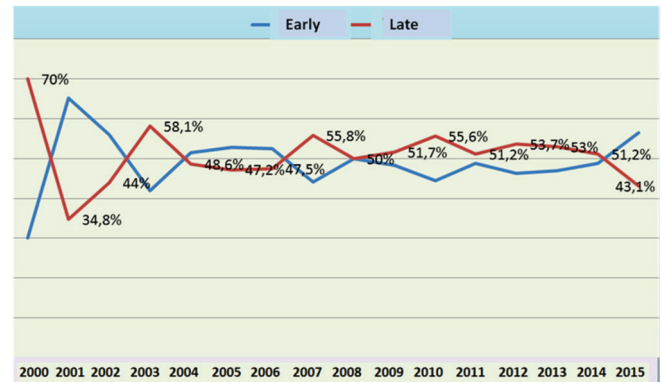
Figure 3. *Breast cancer status at HRA from 2000 to 2015.*

Figure 4. *Temporal status of breast cancer at HRA from 2000 to 2015.*

patients diagnosed with late stage are usually observed in underdeveloped areas[8-10].

In particular, the state of Tocantins in Brazil (former north part of Goias state) is a underdeveloped region and has been considered one of the most vulnerable health areas in Brazil for decades. However, after the creation of the Tocantins state in 1988, a gradual growth of several economic sectors such as commerce, civil construction, and improvement of health care and education, was observed, in special at the city of Araguaína[11]. Due to this apparent development of the region, it would be expected that the number of advanced breast cancer over the years would slow down, but this did not happen. Detailed analysis of staging showed that high percentages of advanced cases persisted over the years, with little variation (more or less) of 50% over the 16 years studied. These results showed that local and regional health actions to control cancer were inefficient over the years.

Some Brazilian researches verified that, even in most developed regions of the country, it may be found high percentages of advanced breast cancer[12]. And others had showed significant improvement in the reduction of late stage diagnosis and mortality rates[12,13]. In general, the percentage of patients with late stage cancer and the mortality rate due to breast tumor are lowering in south, southeast and central-west Brazilian regions. However, it is important to stress that in many of those studies, it was discussed the reality of single Health Centers and with better qualification for oncologic attention[15,16]. When broader studies involving public institutions with regional representativeness are analyzed, it is verified that the percentage of patients diagnosed with late

stage of the disease is considerably higher than that observed in health centers dedicated to oncologic treatment[16].

Several factors may contribute to late diagnosis of women with breast cancer. For example, difficult access to medical care, low number of specialized centers, and scarce knowledge of breast cancer among health care professionals[9,14,17,18]. For improvement, it is necessary a well-structured health system, with pro-active professionals, that can anticipate the occurrence of the disease in a participative society with active citizens.

In developed countries, with good health system, mortality rate due to breast cancer is lowering over the last years and is closely related to early diagnosis. The development of efficient programs to treat breast cancer includes screening with mammography of target population, exams with good quality and adequate treatment of the disease[19,20]. There should be equivalent attention from promotion to palliative care in late stages. In those countries, less than 10% of tumors are detected in late stages[21].

In Brazil, actions against breast cancer have been inefficient and without correct comprehensiveness, leading to higher rate of diagnosis in late stages, and high mortality of Brazilian women due to breast cancer[17]. In northern region of Brazil, it is observed the lowest coverage of mammography screening of target women [22].

It was also observed in this study that there is a strong association between late stage and race/black color (p=0,012). Similar results were also found by other authors, that verified that black women

Table 1. *Socio-demographic data and breast cancer status.*

	Early Stage		Late stage		Total		p value
	N	%	N	%	N	%	
Race/color	652	47.9	709	82.1	1361	100.0	0.012¤
White	137	53.1	122	46.9	259	100.0	
Black	24	31.3	**52**	**68.7**	76	100.0	
Yellow	05	20.0	20	80.0	25	100.0	
Brown	466	48.0	504	52.0	970	100.0	
Indigenous	13	43.5	18	56.5	31	100.0	
Schooling	614	48.7	646	51.3	1260	100.0	0.003
Illiterate	63	37.8	**103**	**62.2**	166	100.0	
Incomplete fundamental	264	49	275	51.0	539	100.0	
Complete fundamental	77	48.6	82	51.4	159	100.0	
Complete high school	117	49.1	122	509	239	100.0	
Incomplete superior	18	33.3	35	66.7	53	100.0	
Complete superior	**68**	**65.2**	36	34.8	104	100.0	
Origin	649	47.4	721	52.6	1370	100.0	0.009
RS Augustinópolis	47	43.5	60	56.5	107	100.0	
RS Araguaína	209	49.6	212	50.4	421	100.0	
RS Guaraí	63	45.1	76	54.9	139	100.0	
RS Paraíso	33	72.4	12	27.6	45	100.0	
Palmas	77	53.3	68	46.7	145	100.0	
RS Porto Nacional	27	60.9	17	39.1	44	100.0	
RS Gurupi	15	38.6	25	61.4	40	100.0	
RS Dianópolis	13	50.0	13	50.0	26	100.0	
Pará	70	36.8	**121**	**63.2**	191	100.0	
Maranhão	74	42.3	100	57.7	174	100.0	
Others	**24**	**63.9**	14	36.1	38	100.0	
Referral center	669	48.2	719	51.8	1388	100.0	0.424¤
SUS	542	47.5	598	52.5	1140	100.0	
No SUS	115	53.3	100	46.7	215	100.0	
On its own	11	33.3	22	66.7	33	100.0	
Alcoholintake	590	48.4	628	51.6	1218	100.0	0.543
Never	407	49.4	416	50.6	823	100.0	
Formerconsumption	35	38.9	56	61.1	91	100.0	
Yes	142	46.7	162	53.3	304	100.0	
Smoking	594	48.3	635	51.7	1229	100.0	0.434
Never	345	50.1	344	49.9	689	100.0	
Formersmoker	74	43.6	96	56.4	170	100.0	
Yes	172	46.5	198	53.5	370	100.0	
Age range	703	49.9	706	50.1	1409	100.0	0.413
Upto 29 anos	34	50.8	32	49.1	66	100.0	
30-39 years	93	49.7	94	50.3	187	100.0	
40-49 years	189	50.5	185	49.5	374	100.0	
50-59 years	207	51.4	195	48.6	402	100.0	
60-69 years	99	45.4	119	54.6	218	100.0	
70 or more years	83	51.2	79	48.8	162	100.0	
Positive familiar history	590	50.0	591	50	1181	100.0	0.363
Yes	278	46.7	31.8	53.3	596	100.0	
No	312	53.3	273	46.7	585	100.0	
Marital status	618	45.8	731	54.2	1349	100.0	0.063
Single	110	37.7	182	62.3	292	100.0	
Married/consensual union	370	48.2	398	51.8	768	100.0	
Widow	100	47.2	112	52.8	212	100.0	
Divorced	38	50.0	39	50.0	77	100.0	

¤ - *Descriptive level of Chi-square test or Exact Fisher (*)*

delayed more to diagnose and treat the disease, compared to white race[23]. In the USA, where racial miscegenation is less evident, white women present higher incidence of breast cancer in comparison to other races and ethnicity. However, African-American women are more prone to die due to the disease. These differences are caused by difference of access to health care and treatment[21,23].

However, data collection about trace/color of patients with breast cancer is still faulty, since it is recommended self-classification. It must be pointed out that the high grade of miscegenation in Brazil, as well as the subjectivity to determine the color of the skin, may cause bias in the interpretation of collected data[13]. Also, another aspect of the more aggressiveness of breast cancer in black women may be related to the phenotype triple-negative that seems to occur with higher frequency in young African-American women, particularly during pre-menopause[24].

In relation to schooling, in this study, we observed a significant association with clinical stage (p=0.003): illiterate women showed higher percentage of late stage disease, while patients with complete higher education showed more early stage disease. These findings are in accordance to others in literature, including studies that showed a direct relation of schooling and mortality rate due to breast cancer. Most deaths in women with low schooling are associated with diagnosis of breast cancer in late stage[25].

In the poorest regions of the planet and with very low schooling rates, stigma associated with cancer slows down the search for medical care. Survival rate in 5 years is less than 50% in Gambia, Uganda and Algeria, compared to almost 99% in the USA[4]. On the other hand, women with higher grade of schooling look for more early diagnosis of breast cancer, attending medical offices and performing mammography[26].

In this analysis, it is also possible to observe that patients from the southeast region of Para State showed higher percentage of late stage cancer (p=0.009), maybe due to some particularities of this regions. Southeast region of Para State has no medical care, low social development and poor economics and schooling[11]. Data from IPEA (*Instituto de Pesquisa Econômica Aplicada-* Applied Economics Research

Institute) shows that Para State has in absolute number a percentage above national media of illiterate people (13.8%), reaching 23% in rural areas and 7% in urban areas. There is also a difference between white illiterates (5.9%) and black illiterate people (13.4%). Another aspect that reinforces disparity is per capita income that, in that population, is less than half of national media[11]. Therefore, such aspects associated to the low quality of health care, difficult access to specialized health oncologic centers and referral inefficacy, justify the results here described. Similar results were presented by other authors, that stated that the difficulty to access the public health care is higher in low socio-economic and lower schooling patients, making also difficult health actions for early diagnosis[27]. In regions with low human development index, such as Western Africa, more than 70% of patients with breast cancer were diagnosed at stages III or IV[27,28]. Similar results were verified in Libya and Nigeria[28]. However, in more developed regions such as Europe and USA, women are more frequently diagnosed with early stage disease[28].

The importance of early diagnosis of breast cancer in public health services is been highlighted, by promotion of discussion about access and inclusion of those patients. In order to face these challenges, it is important to involve society, researchers, medical professionals and health managers.

We can conclude that our study showed that actions to fight breast cancer in the region are inefficient, since most women in northern Tocantins were diagnosed with late stage disease, and temporal evolution of the proportion of cases with late or early diagnosis has not changed over the years 2000 to 2015. Late stage breast cancer in women from Tocantins was associated with race/black color, low level of schooling, and origin from southeast Para. Finally, due to the situation of breast cancer in northern Tocantins, it is possible to assume that health care and prevention of the diseases are inadequate, with chronic health deficiency. Future epidemiologic research information will improve the understanding of breast cancer and other chronic diseases in the region and will guide the necessary actions to be taken to improve health care of affected population or at greater risk.

R E S U M O

Objetivo: avaliar a variação temporal dos percentuais de câncer mamário feminino em estádios precoce e tardio e analisar as variáveis sócio-demográficas associadas com esses estádios. **Métodos**: estudo de dados secundários realizado entre 2000 e 2015 no Hospital Regional de Araguaína, Araguaína, TO, Brasil. **Resultados**: foram diagnosticados 51,1% de casos de câncer mamário em fase avançada e 48,9% em fase precoce. Não houve diferença significativa dos percentuais de pacientes com estádios precoces e tardios ao longo dos anos avaliados. As mulheres de raça/cor preta, analfabeta e de procedência do sudeste do Pará apresentaram maior porcentagem de estadiamento tardio no momento do diagnóstico. **Conclusões**: a maioria das mulheres foi diagnosticada com doença avançada; a evolução temporal da proporção de casos (avançado/precoce) não demonstrou mudanças variacionais ao longo dos anos; foi identificado associação da doença em estádio avançado nas mulheres de raça/cor preta, analfabetas e provenientes do sudeste do Pará.

Descritores: Neoplasias da Mama. Epidemiologia Descritiva. Estadiamento de Neoplasias. Diagnóstico Tardio.

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