Descriptive study of breast cancer cases in Goiânia between 1989 and 2003

Estudo descritivo dos casos de câncer de mama em Goiânia, entre 1989 e 2003

Rodrigo Disconzi Nunes[1]; Edesio Martins[2]; Ruffo Freitas-Junior, TCBC-GO[3] ; Maria Paula Curado[4]; Nilceana Maya Aires Freitas[5]; José Carlos de Oliveira[2]

A B S T R A C T

Objective: To describe cases of breast cancer in women living in Goiânia from 1989-2003. **Methods**: We conducted a retrospective, descriptive stud, which included all cases of breast cancer occurring in residents of Goiânia, identified by the Population-Based Cancer Registry of Goiânia (RCBPGO) in the period from 1989 to 2003. The variables were: age, method of diagnosis, topographic location, morphology and extent of breast cancer. We used frequencies and percentage rates, and Poisson regression to determine the annual percentage change (APC). **Results**: We identified 3204 cases of breast cancer. The most frequent topographic location was the superior-lateral quadrant (53.7%). Infiltrating ductal carcinoma (IDC) was the most frequent, with 2582 cases (80.6%), followed by infiltrating lobular carcinoma (ILC), with 155 cases (4.8%). There was a significant increase of both the IDC and the ILC, with APCs of 11.0% and 15.4%, respectively. The ratio between IDC and ILC was not influenced by age (p = 0.98). As for tumor extent at diagnosis, 45.6% were located in the breast, and the APC was 16.1% (CI = 12.4 to 20.0, p <0.001). There was a trend of APC reduction of metastatic cases (-3.8, CI = -8.6 to 1.2, p = 0.12). **Conclusion**: The topographical location and histological type of breast cancer in the city of Goiania followed the pattern of other countries. The main morphological types were not influenced by age. There was a large increase in initial cases.

Key words: Breast neoplasms. Women. Cross sectional studies. Incidence. Epidemiology.

INTRODUCTION

The incidence of breast cancer has been decreasing in recent years in some developed countries including the United States[1]. In Brazil and other developing countries, its incidence continues increasing [2-5].

In Brazil, for the year 2010, 49,240 new cases were estimated[3], representing an incidence of 49 cases for every hundred thousand women[2], with a growth trend, especially for women between 40 and 59 years[5].

Breast cancer is the leading cause of cancer death among Brazilian women, with mortality rates showing a trend to stabilization[6]. In Goiania, the standardized mortality rate for world population of Segi [7] was 14.87/100,000 in 1988, rising to 18.18/100 000 women in 2002[8].

Invasive ductal carcinoma (IDC) and invasive lobular carcinoma (*ILC*) are the most common types of breast cancer [9], and its morphology tends to follow an international standard [10-12].

Although it is well established that early diagnosis and treatment affect mortality rates and prevalence of the neoplasia[11,13], there are few data available regarding the descriptive epidemiology of breast cancer in Brazil.

The absence of such information makes both the assessment of screening programs for breast cancer and for comparison with other regions difficult. Thus, we proposed to describe some epidemiological characteristics of breast cancer in the female population of the city of Goiânia in the period from 1989 to 2003, according to variables collected by the Population-Based Cancer Registry.

METHODS

This study was approved by the Ethics Committee of the Association Against Cancer of Goiás (Report 071/07). It is a descriptive, retrospective, population-based study,

Work conducted by the Goiás Mastology Research Network, Goiás, Brazil.
1. Master's Degree, Health Sciences, Postgraduate Program in Health Sciences, Faculty of Medicine, Federal University of Goiás - GO-BR; 2. Epidemiologist, Goiânia Population-based Cancer Registry, Association Against Cancer of Goiás-GO-BR; 3. Associate Professor, Department of Obstetrics and Gynecology, Federal University of Goiás -GO-BR; 4. Head, Department of Descriptive Epidemiology - International Agency for Research on Cancer (IARC); 5. Radiologist, Service of Radiation Oncology, Araujo Jorge Hospital, Association Against Cancer of Goiás-GO-BR.

of women with malignancies of the breast in Goiânia, Goiás State, Brazil.

The cases were identified in the database of the Population-Based Cancer Registry of Goiânia (RCBPGO) and collected in the period from 1989 to 2003. The variables analyzed were patient age at diagnosis; diagnostic basis, which is the form in which case information is collected (either by cytology or histology). When these tests were absent, data were collected by imaging or clinical data described by the doctor.

We used the topography and morphology, as the O3 ICD (International Classification of Diseases for Oncology, 3rd ed.)[14]. The tumors with squamous cell carcinoma (SCC) histological type were withdrawn from the study because the topography was originated from the skin of the breast.

We also analyzed the extent of disease. We considered as an *in situ"*lesion when the histology returned as such, without invasion of the basement membrane; "localized", the invading tumor, in which histological examination showed no axillary lymph node status and the patient did not have detectable metastases by clinical examination or by imaging; "regional", when there was reference to lymph node involvement described in histology or, in the absent of that, there was clinically palpable axillary lymph nodes described by the attending physician at the staging phase; "metastasis", when the clinical report, imaging or histological examination showed the presence of metastatic disease outside the breast and ipsilateral axilla.

The eligibility criteria for inclusion of cases followed the methodology of RCBPGO. Eligibility for inclusion included all cancer cases diagnosed annually in women who were residents in the municipality of Goiânia. To avoid selection bias of patients who came from other places to be treated in Goiania, a diagnosis of cancer should arise in a date later than the one on which the patient fix her residence in the city, and, for purposes of registration, the time taken for housing the patients before the start of treatment was six months.

We used the software SPSS ® (Statistical Package for the Social Sciences), version 15.0, for the making of the database. Frequencies for all variables and analysis of central tendency were observed to determine the mean and median age.

We used Poisson regression to calculate the annual percentage change (Statistical Research and Applications Branch Division of Cancer Control and Population Sciences, National Cancer Institute, USA).

RESULTS

We collected, by RCBPGO, 3204 cases of breast cancer in the period from 1989 to 2003. The average age was 56 years, with a median of 53 years and standard deviation of ± 16 years. Also in relation to age, 15.2% of women were 40 years or less and 57% were over 50 years.

Of the total of 3204 cases diagnosed between 1989 and 2003, in 857 the topographic location could be known. Of these, the most common location was superior lateral (SLQ), with 53.7% (n = 461), followed by the superior medial (SMQ) in 15.8% (n = 136) and the inferior lateral (ILQ) 12.1% (n = 104). For other topographic locations, the values were: inferior medial quadrant (IMQ) in 11.4% (n = 98), overlapping lesion of the breast (OLB) in 5.01% (n = 43), nipple-areola 1.63% (n = 14) and 0.11% in the axillary extension (n = 1).

The most common morphology was infiltrating ductal carcinoma, with 2582 cases (80.6%), followed by infiltrating lobular carcinoma (4.8%). The extranodal lymphomas and sarcomas comprised less than 1% of cases (Table 1). The analysis of trends over time showed that both the average percentage change for invasive ductal and invasive lobular carcinomas increased significantly during the study period (Table 2). There was an equal distribution of morphological types of cancer among the age groups (Table 3).

Regarding the extent of disease, it was shown that 45.60% of the cases were found, 19.70% had tumor with regional extension and 10.20% had distant metastases at diagnosis; only 4.20% (133) were in situ tumors. In this analysis, 20.30% of cases had no information about the extent of disease at diagnosis.

Table 1 - Absolute and relative frequencies of patients with breast cancer in Goiânia (1989-2003), according to morphology (n = 3204).

Morphology	N	%
Other malignant neoplasms	265	8,3
Mucinous Adenocarcinoma	18	0,6
Papillary Carcinoma	16	0,5
NOS Adenocarcinoma	48	1,5
In Situ Ductal Carcinoma	45	1,4
Infiltrating ductal Carcinoma	2582	80,6
Comedocarcinoma	18	0,6
Medullary Carcinoma	20	0,6
In Situ Lobular Carcinoma	2	0,1
Infiltrating Lobular Carcinoma	155	4,8
Infiltrating Ductal Carcinoma	6	0,2
Inflammatory Carcinoma	2	0,1
Paget's disease	11	0,3
NOS Sarcoma	10	0,3
Malignant Phyllodes Tumor	1	0,0
Malignant Lymphoma	4	0,1
Total	3204	100,0

NOS: not otherwise specified – there was no information on the morphology of lesion; Other malignancies included: malignant neoplasms, NOS carcinomas, usual acinar adenocarcinomas, undifferentiated carcinoma.

Table 2 – Analysis of the evolution of the annual percentage change of the most frequent morphological types.

Histology	% Initial	% Final	APC (CI 95%)	P
Invasive ductal Carcinoma	3.37	12.66	11% (9.6 - 12.4)	<0.001
Invasive lobular Carcinoma	1.29	18.71	15.4% (9.2 - 22.1)	<0.001

% Initial = percentage rate of the total number of cases in the year 1989; % Final = percentage rate of the total number of cases in the year 2003; APC = average percentage change; CI = confidence interval.

Table 3 – Distribution of the main morphological types of breast cancer, according to age groups.

Histology	Age (years)						Total	
	up to 39		40 to 59		≥60			
	N	%	N	%	N	%	N	%
Invasive ductal Carcinoma	395	94	1302	94	885	94	2582	94
Invasive lobular Carcinoma	24	6	77	6	54	6	155	6

$x^2 = 0,3$; $p = 0,98$.

The rate of in situ cases was zero in 1989, increasing to 9.80% in 2003. In contrast, we observed that patients with advanced disease decreased from 25.38% to 6.37%. The percentage distribution of all cases, according to tumor extension and by year of diagnosis, is shown in figure 1. By Poisson regression, we found that the annual percentage change was 16.1% (95% CI = 12.4 to 20.0) for cases of localized tumors (p <0.001). For those cases with metastases at diagnosis, there was a non-significant reduction of the percentage average change, which was -3.83 (95% CI = -8.6 to 1.2) (p = 0.12).

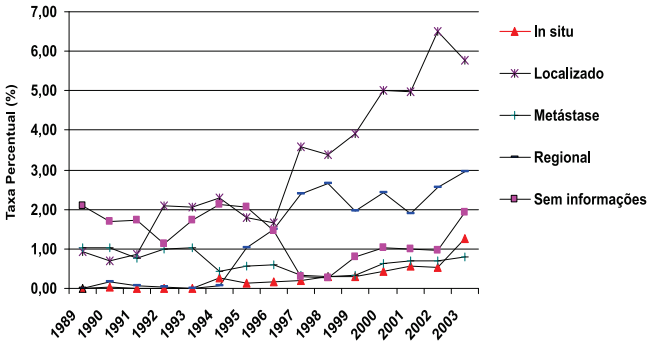

Figure 1 - *Percentage distribution of the total number of cases of breast cancer in Goiânia according to the extent of disease and year of diagnosis.*

DISCUSSION

This study showed that the average age of women diagnosed with breast cancer in Goiânia was 56 years and median of 53 years, corroborating other studies[15-17]. This result confirms that breast cancer is more common in women over 50 years of age[5,18], stressing that prevention programs should prioritize risk age groups.

During the study period there was an increase in the absolute number of cases of breast cancer, possibly due to the constant changes occurring in the lifestyle of some Goiânia women, proven by data from the Surveillance of Risk and Protective Factors for Chronic Diseases Phone Survey (VIGITEL), including the increased use of alcohol and increased intake of foods with polyunsaturated fats[19]. Other factors that should possibly have contributed to the increased number of cases was improving coverage of screening mammography in the state of Goiás, which is increasing for women over 40 years[20,21], in addition to increasing and aging of the Goiânia population[22].

Confirmation of the diagnosis by histopathology, over 90% of cases, ensures the quality of information generated by RCBPs[23], for of the 3204 patients with breast cancer enrolled in RCBPGO, 94.7% were confirmed by histopathology, with a increase of 10% in the last five years.

The results confirm that the SLQ of the breast is the anatomical location of greatest involvement for breast cancer, followed by the SMQ, corroborating data from other authors[24,25]. However, this information should be viewed with caution, since in 73% of cases there was no reference to location.

Infiltrating ductal carcinoma was the most frequently reported tumor morphology by this study, followed by infiltrating lobular carcinoma, these findings are similar to other works'[24,25]. It was also possible to observe the significant increase of the two most common morphological types, and the average percentage increase of ILC was numerically greater than the one of IDC. Although it was previously observed that age can somehow influence the histological type[9], in the present study we observed that the distribution of the morphological types was not influenced by age. This finding, although

controversial, was also observed in a previous study[26].

Regarding the extent of the disease, in 2002 Miller *et al.*[27] reported that in the United States tumors localized only in the breast were more frequent, ranging from 54% to 72% of cases, followed by tumors with regional extension (axillary lymph nodes), between 23% and 38%. For tumors with distant metastases at diagnosis, they found rates of 3% to 9%. Unlike the statistics of developed countries, our study showed that 45% of cases of breast cancer were reported to be localized, 10% regional and that approximately 20% of cases were diagnosed with distant metastases.

The low percentage of regional tumors reported is due to RCBPGO's late beginning to report cases of regionalization of breast cancer, in 1994. Probably, in previous years, the tumors have been registered as regional metastatic tumors, justifying the difference from the literature[28]. Despite this high percentage rate of patients with metastases at diagnosis as a whole, we observed an important change in the Brazilian statistics from other studies, which suggest rates of up to 70% of the diagnosis of breast cancer in advanced stages[29,30]. The results presented are relevant, since they are based on information from a population of approximately 674,692 female inhabitants[22].

We observed an increase of carcinomas *in situ* and of localized extension carcinomas, which was significant. This change suggests that government, private and third sector actions, in combination, may have generated benefits for the population at risk of breast cancer, allowing early diagnosis[21].

With the present study we observed that there was a growing number of new cases of breast cancer among the residents of Goiania in the 15 analyzed years, and finally, the most valuable information presented, the profile suggests that breast cancer diagnosis in the city of Goiânia is changing, with a substantial increase in the initial diagnosis of cases over a reduction in advanced ones.

R E S U M O

Objetivo: *Descrever os casos de câncer de mama nas mulheres residentes em Goiânia no período 1989-2003.* ***Métodos:*** *Estudo retrospectivo, descritivo, que incluiu todos os casos de câncer de mama ocorridos nas moradoras de Goiânia, identificados pelo Registro de Câncer de Base Populacional de Goiânia (RCBPGO), no período de 1989 a 2003. As variáveis estudadas foram: idade, método de diagnóstico, localização topográfica, morfologia e extensão do câncer de mama. Foram utilizadas frequências e taxas percentuais, além da regressão de Poisson para determinação da mudança percentual anual (MPA).* ***Resultados:*** *Foram identificados 3204 casos de câncer de mama. A localização topográfica mais frequente foi o quadrante superior lateral (53,7%). O carcinoma ductal infiltrante (CDI) foi o mais freqüente, com 2582 casos (80,6%), seguido pelo carcinoma lobular infiltrante (CLI), com 155 casos (4,8%). Houve aumento significante tanto do CDI quanto do CLI, sendo a MPA de 11,0% e de 15,4%, respectivamente. A proporção entre CDI e CLI não foi influenciada pela idade (p=0,98). Quanto à extensão do tumor ao diagnóstico, 45,6% dos casos eram localizados na mama, sendo que a MPA foi de 16,1% (IC= 12,4 a 20,0; p<0,001). Houve tendência de redução da MPA dos casos metastáticos (-3,8; IC= -8,6 a 1,2; p=0,12).* ***Conclusão:*** *A localização topográfica e o tipo histológico do câncer de mama, na cidade de Goiânia, seguem o padrão de outros países. Os principais tipos morfológicos não foram influenciados pela idade. Houve grande aumento de casos iniciais.*

Descritores*: Neoplasias da mama. Mulheres. Estudos transversos. Incidência. Epidemiologia.*

REFERENCES

1. Jemal A, Siegel R, Xu J, Ward E. Cancer statistics 2010. CA Cancer J Clin 2010; 60(5):277-300.
2. Jemal A, Center MM, DeSantis C, Ward EM. Global patterns of cancer incidence and mortality rates and trends. Cancer Epidemiol Biomarkers Prev 2010; 19(8):1893-907.
3. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Instituto Nacional de Câncer Coordenação de Prevenção e Vigilância de Câncer. Estimativa 2010: Incidência de câncer no Brasil [online]. Rio de Janeiro: INCA, 2010. [acessado em 08 out. 2010]. Disponível em: http://www.inca.gov.br/estimativa/2010/index.asp?link=tabelaestados.asp&UF=BR
4. Freitas-Junior R, Freitas NM, Curado MP, Martins E, Moreira MA, e Silva CM. Variations in breast cancer incidence per decade of life (Goiania, GO, Brazil): 16-years analysis. Cancer Causes Control 2008; 19(7):681-7.
5. Freitas Jr R, Freitas NM, Curado MP, Martins E, Silva CM, Rahal RM, et al. Incidence trend for breast cancer among young women in Goiânia, Brazil. Sao Paulo Med J 2010; 128(2):81-4.
6. Fonseca LA, Eluf-Neto J, Wunsch Filho V. Cancer mortality trends in Brazilian state capitals, 1980-2004. Rev Assoc Med Bras 2010; 56(3):309-12.
7. Segi M. Graphic presentation of cancer incidence by site and by area and population. Nagoya, Japan: Segi Institute of Cancer Epidemiology; 1977.
8. Freitas NMA, Freitas Junior R, Curado MP, Martins E, Bandeira e Silva CM, Moreira MAR, et al. Tendência da incidência e da mortalidade do câncer de mama em Goiânia: análise de 15 anos (1988-2002). Rev bras mastologia 2006; 16(1):17-21.
9. Albrektsen G, Heuch I, Thoresen SØ. Histological type and grade of breast cancer tumors by parity, age at birth, and time since birth: a register-based study in Norway. BMC Cancer 2010; 10:226.
10. Dutra MC, Rezende MA, Andrade VP, Soares FA, Ribeiro MV, Paula EC, et al. Imunofenótipo e evolução de câncer de mama: comparação entre mulheres muito jovens e mulheres na pós-menopausa. Rev Bras Ginecol Obstet 2009; 31(2):54-60.
11. Simon S, Bines J, Barrios C, Nunes J, Gomes E, Pacheco F, et al. Clinical characteristics and outcome of treatment of Brazilian women with breast cancer treated at public and private institutions

– The Amazone Project of the Brazilian Breast Cancer Study Group (GBECAM). Cancer Res 2009; 69 (24 Suppl):Abstract nr3082.
12. Hemminki K, Granström C. Morphological types of breast cancer in family members and multiple primary tumours: is morphology genetically determined ? Breast Cancer Res 2002; 4(4):R7.
13. Nelson HD, Tyne K, Naik A, Bougatsos C, Chan BK, Humphrey L, et al. Screening for breast cancer: an update for the U. S. Preventive Services Task Force. Ann Intern Med 2009; 151(10):727-37.
14. Fritz A, Percy C, Jack AShanmugaratnam K, Sobin L, Parkin DM, Whelan S, editors. International classification of diseases of oncology. Genebra:WHO; 2000.
15. Mendonça GAS, Silva AM, Caula WM. Características tumorais e sobrevida de cinco anos em pacientes com câncer de mama admitidas no Instituto Nacional do Câncer, Rio de Janeiro, Brasil. Cad Saúde Pública 2004; 20(5):1232-9.
16. Moraes AB, Zanini RR, Turchiello MS, Riboldi J, Medeiros LR. Estudo da sobrevida de pacientes com câncer de mama atendidas no hospital da Universidade Federal de Santa Maria, Rio Grande do Sul, Brasil. Cad Saúde Pública 2006; 22(10):2219-28.
17. Arpino G, Bardou VJ, Clark GM, Elledge RM. Infiltrating lobular carcinoma of the breast: tumor characteristics and clinical outcome. Breast Cancer Res 2004; 6(3):R149-56.
18. Hadjisavvas A, Loizidou MA, Middleton N, Michael T, Papachristoforou R, Kakouri E, et al. An investigation of breast cancer risk factors in Cyprus: a case control study. BMC Cancer 2010; 10:447.
19. Brasil. Portal da saúde. Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico (VIGITEL) [online]. Brasília: Ministério da Saúde. [acessado em 08 out. 2010]. Disponível em: http://portal.saude.gov.br/portal/saude/profissional/visualizartexto.cfm?idtxt=30864&janela=1
20. Brasil. IBGE – Instituto Brasileiro de Geografia e Estatística. Diretoria de Pesquisas. Acesso a utilização de serviços de saúde 2003. PNADSaúde, 2003 [online]. [Acessado em 08 out. 2010]. Disponível em http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2003/saude/
21. Freitas-Junior R, Corrêa RS, Peixoto JE. Desigualdade na cobertura mamográfica no estado de Goiás, Brasil. Jornada Paulista de Radiologia, 2010, São Paulo. [acessado em: 08 out. 2010]. Disponível em: http://www.spr.org.br/jpr2010_trabalhos.
22. Brasil. Departamento de informática do SUS (DATASUS) [online]. Brasília: Ministério da Saúde. [acessado em: 08 out. 2010]. Disponível em: http://tabnet.datasus.gov.br/cgi/deftohtm.exe? ibge/cnv/popgo.def.
23. Parkin DM, Whelan SL, Ferlay J, Teppo L, Thomas DB, editors. Cancer incidence in five continents. Lyon, France: IARC Scientific; 2002.
24. Eisenberg ALA, Koifman S. Aspectos gerais dos adenocarcinomas de mama, estadiamento e classificação histopatológica com descrição dos principais tipos. Rev bras cancerol 2000; 46(1):63-77.
25. Tavassoli FA. Pathology of the breast. 2ª ed. Stanford: Appleton and Lange; 1999.
26. Lee JH, Park S, Park HS, Park BW. Clinicopathological features of infiltrating lobular carcinomas comparing with infiltrating ductal carcinomas: a case control study. World J Surg Oncol 2010; 8:34.
27. Miller BA, Hankey BF, Thomas TL. Impact of sociodemographic factors, hormone receptor status, and tumor grade on ethnic differences in tumor stage and size for breast cancer in US women. Am J Epidemiol 2002; 155(6):534-45.
28. Martins E, Freitas-Junior R, Curado MP, Freitas NM, De Oliveira JC, Silva CM. Temporal evolution of breast cancer stages in a population-based cancer registry in the Brazilian central region. Rev Bras Ginecol Obstet 2009; 31(5):219-23.
29. Cezar Jr OP. Carcinoma de mama em Bragança Paulista – Experiência de uma década. Ginec Obstet Atual 1996; 5(1):9-13.
30. Freitas-Junior R, Silveira-Junior LP, Carneiro AB, Ribeiro LFJ, Queiroz GS. Fatores Associados à perda de seguimento das pacientes tratadas de câncer de mama. Rev Bras Mastol 1997; 7(1):58-63.

Received: 20/08/2010
Accepted for publication: 22/10/2010
Conflict of interest: none
Source of funding: partly funded (Research Support Foundation of the State of Goiás (FAPEG) Protocol. 200710267000252, and the Institute Avon.

How to cite this article:
Nunes RD, Martins E, Freitas-Junior R, Curado MP, Freitas NMA, de Oliveira JC. Descriptive study of breast cancer cases in goiânia between 1989 and 2003.Rev Col Bras Cir. [periódico na Internet] 2011; 38(4). Disponível em URL: http://www.scielo.br/rcbc

Correspondence to:
Ruffo Freitas-Junior
E-mail: ruffojr@terra.com.br