CASE REPORT
https://doi.org/10.29289/2594539420220004

Stage IV invasive breast cancer in an indigenous villager: a case report and review of literature

Maillene Rodrigues Lisboa[1]*, Ana Lucia Escobar[1], Thamy Yamashita Shibayama[1], Raphael Lima de Assis Oliveira[1], Marcos Vinícius dos Santos[1]

ABSTRACT

Breast cancer is one of the leading causes of death worldwide. Among the risk factors related to this disease, lifestyle and unhealthy diet have important relevance. In the present report, we describe the case of an indigenous villager who consumed processed foods, such as snacks, soft drinks, artificial juice and biscuits. Therefore, we were able to observe a transition in habits of the indigenous population with possible epidemiological repercussions.

KEYWORDS: breast cancer; risk factors; health services accessibility

INTRODUCTION

Breast cancer is among the most common cancer, being one of the main causes of mortality among American and Alaska native peoples. This population showed between the years 2012 and 2016 an incidence of 79.5 cases per 100 thousand individuals and a mortality rate of 14.3 deaths per 100 thousand individuals[1].

In Brazil, there is a lack of information on the behavior of different types of cancer in the indigenous population. The Ministry of Health estimates, for the year 2020, 66,280 new cases of breast cancer for the general population, corresponding to 29.7% of all female cancers[2].

The portrait of this cancer in the Brazilian population was clearly demonstrated by Rosa et al.[3]. The mean age at diagnosis was 53.9 years, and only 34% of the total number of diagnosed cases were performed through screening tests. Patients who used supplementary health plans were diagnosed at earlier stages, when compared to those in the public health service[3].

This disease has very well-established risk factors: menstrual-reproductive, environmental and lifestyle. Among these, the modifiable ones such as obesity and alcohol consumption, which can impact the incidence and mortality of various diseases[4], stand out.

In the last census carried out in Brazil, in 2010, 817,963 people declared themselves as being indigenous, with the highest concentration in the northern region of the country[5]. This is where the Nambikwara people live, in an area that comprises the northwest of the state of Mato Grosso and the south of the state of Rondônia. They are composed of several subgroups, according to the place they occupy. In Vale do Guaporé (RO) live the Hahaintesu, who speak the language of the Nambikwara linguistic family. There lies the west of the Nambikwara territory, with 85% of the area covered by forest[6]. Men have some degree of understanding of Portuguese, since they leave the villages more often, which allows for a closer contact with the habits of the surrounding national society, including processed foods. This is the scenario in which the patient featured in this report lived. She left the area in search of treatment at a state referral unit.

In the current scenario, according to the 1988 Constitution, health is a fundamental right. Inequalities determine the health standards faced by each population group, and indigenous peoples are exposed to a situation of greater vulnerability and less coverage of health programs and services[7].

This aim of this study was to describe a case of ductal carcinoma in an indigenous woman who had never had contact with the surrounding national society and who had an unfavorable outcome as a consequence of the difficulty in accessing health services, a factor that compromises the prognosis.

The present report was obtained based on the care of an indigenous patient at the mastology outpatient clinic of the high complexity unit sector of the Hospital de Base Dr. Ary Pinheiro (RO), during 2015 and 2016. Data were collected by the first author himself, during seven meetings for consultations and returns.

CASE REPORT

Nambikwara Hahaintesu indigenous woman, 49 years old, with body mass index (BMI) of 28 kg/m^2 and normal vital signs, communicated

[1]Universidade Federal de Rondônia, Departament of Medicine – Porto Velho (RO), Brazil.
***Corresponding author:** maillenelisboa@unir.com
Conflict of interests: nothing to declare. **Funding:** none.
Received on: 02/17/2022. **Accepted on:** 08/04/2022.

through her partner, who understood some Portuguese, thus with some obstacles in communication. She reported swelling and intense pain in the left breast for a year and recent onset of redness and local swelling. Menarche was at age 18; the woman, G8P7A1, had all deliveries vaginal, the first at full term at age 22. She had no other complaints, past or present illnesses or medication use. She has always lived in the village, which has guided her life habits. She fed on products from collection, local agriculture, hunting and fishing, and also processed foods such as snack foods, soft drinks, artificial juices and cookies. On physical examination, she was in a regular general condition and lucid and oriented in time and space, with discolored mucous membranes. Static inspection revealed hyperchromic, crusted scars in the thoracic region and upper abdomen, edema, hyperemia and increased volume of the left breast, perception of a hardened mass occupying the entire left breast, coalescing lymph nodes in the ipsilateral axillary fossa and lymph node enlargement in the left cervical chain; and the right breast was flaccid and hanging, without palpable masses (Figure 1). Mammography showed fat-replaced breasts with skin thickening and a spiculated nodule measuring about 8.0 x 4.0 cm in the central region of the left breast; the lesion was Breast Image Reporting and Data System (BIRADS) 5. Histological examination was compatible with invasive ductal carcinoma, histological grade of Nottingham 2, reticular dermis infiltrate and subcutaneous cellular tissue, presence of lymphatic and perineural invasion, inflammatory infiltrate in the mild-tumor stroma, and epidermis and papillary dermis free of neoplasia (Figure 2). Immunohistochemistry indicated: estrogen receptor (ER)-positive at 70%; weak (focal) progesterone receptor (PR)- positive; Ki67 positive at 70%; and C-erb-B2 score 3+. Blood count was: red blood cells $3.06x10^6/mm^3$, hematocrit 24.80%; hemoglobin 8.27 g/dL; leukocytes $12,400/mm^3$ and platelets $124,000/mm^3$. Other blood tests showed glucose 85.50 g/dL; transaminases and urea nitrogen normal; and Venereal Disease Research Laboratory (VDRL), HBsAg, anti-HCV and anti-HIV1e2 all negative. Computed tomography of the chest, abdomen and pelvis showed osteolytic and osteoblastic lesions affecting all bones of the rib cage, pelvis and lumbar vertebral bodies. Clinical stage IV (T4bN2M1) was evident.



Figure 1. Static inspection: Chest with multiple hyperchromic scars. Flaccid and pendulous left breast, the right breast increased in volume and firm due to the presence of the tumor – Front view.

She was referred to an outsourced oncology clinic, where she received 6 cycles of docetaxel and zoledronic acid. There was disease progression; she was referred for antialgic radiotherapy, and maintenance tamoxifen was started, while zoledronic acid was continued. She died 13 months after diagnosis.

DISCUSSION

In a review of medical records of adult patients from different ethnic groups and regions of the country diagnosed with solid cancer and treated at the Indigenous Patient Clinic of the Federal University of São Paulo, between 2005 and 2014, with 48 patients from 19 ethnic groups, represented mostly by women, there is no report of breast cancer. For cancer cases followed-up there, there was a mean time between the onset of symptoms and diagnosis of 9.0±8.8 months and between diagnosis and treatment of 3.4±4.6 months, a relatively long time. large, considering that most people came from the Southeast and Central-West regions of the country. This time resulted in diagnoses in more advanced stages of the disease[8].

Indigenous people from the state of Pará were treated at the oncology hospital of reference in that state, with greater representation for females aged between 60 and 69 years. Among these, there was only one case of breast cancer, namely a 34-year-old indigenous woman of Wai Wai ethnicity[9].

Reports in the literature on the incidence of breast cancer in indigenous Brazilians are scarce, either because they are rare or because they are underreported. It should be noted that a lower incidence of this cancer has been observed in minority ethnic groups[10]. Indigenous populations have a higher prevalence of cancer due to unfavorable socioeconomic conditions and infectious agents, as observed in the cancer mortality survey in the state of Acre. Thirty-three deaths were identified in indigenous women, whose main cause was cervical cancer and lower mortality from breast cancer[11]. The same was observed by Freitas-Junior et al., who, researching the number of deaths from breast cancer in Brazilian indigenous women between 2000 and 2010, observed a risk ratio for indigenous women of 0.25[12].

A comparative study with Peruvian indigenous people living in the mountains and in the Amazon rainforest, with invasive breast cancer, found that those living in the jungle had an earlier age at diagnosis, almost five years earlier, triple negative tumors and shorter survival, and mortality was 1.7 times higher in these women. There was a probable association with the distance of this region to the treatment sites and with the strategies to address the disease, respecting the local culture[13].

A survey of 269 breast cancer survivors among American Indians and Alaska Natives, to identify obstacles during treatment, observed

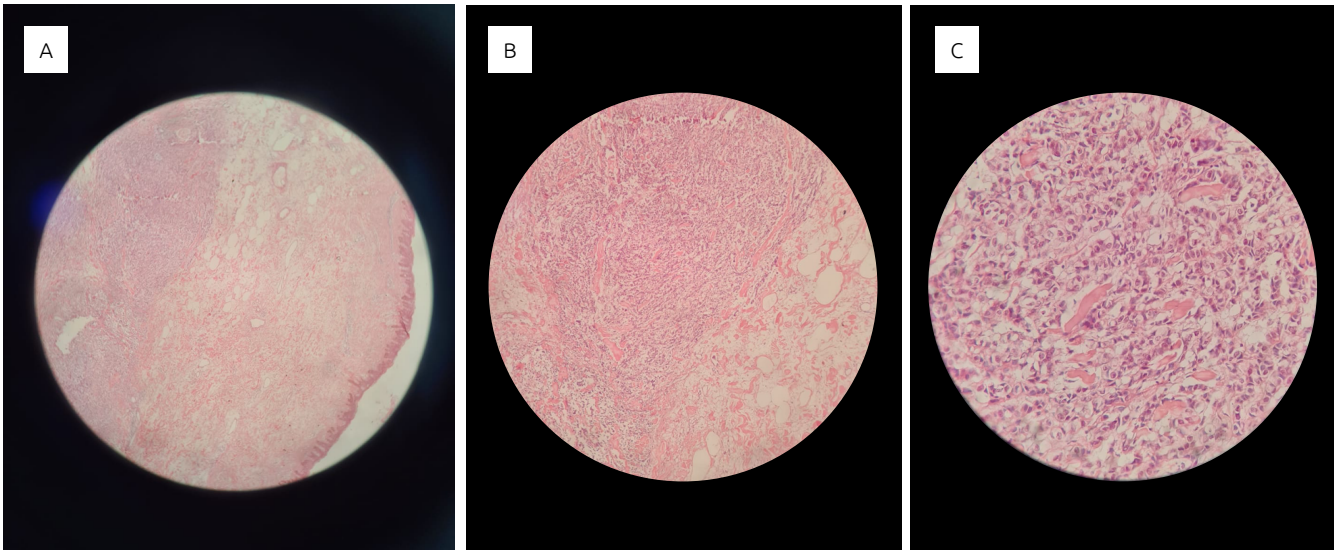


Figure 2. (A) Skin segment with infiltration by invasive breast carcinoma of no special type (NST)/invasive ductal carcinoma not otherwise specified (NOS) in subcutaneous tissue (hematoxylin and eosin, HE: 40x); (B) Cords and nests of atypical cells with prominent nucleoli and anisokaryosis, surrounded by desmoplastic stroma (HE, 250x); (C) Intermediate/grade 2 Nottingham histological grade (Scarrff-Bloom-Richardson modified by Elston and Ellis) invasive carcinoma (tubular formation score 3, nuclear grade score 2 and mitotic index 1) (HE 400x).

that the lower the level of education, the greater was the number of these, such as: difficulties in access, transportation and communication. It is noteworthy that most women had completed high school and were diagnosed in early clinical stages, which is probably why most of them had a survival rate of more than five years[14]. This reality differs greatly from the Brazilian Amazon. It is known that they have lifestyle habits and menstrual and reproductive characteristics that do not match the factors that promote breast cancer[11]. On the other hand, globalization and the facilities of modern life have reached the most distant corners of the country, with risk factors for cancer in general, especially modifiable factors, such as environmental ones. Types of food, active and/or passive tobacco smoke and nutritional factors, such as excessive alcohol consumption and obesity, are increasingly present[4]. In a comprehensive review of diabetes mellitus, metabolic syndrome and the relationship with breast cancer growth and progression, Kang et al. described changes in several compartments. In *in vivo* studies, hyperinsulinemia contributed to tumor growth rather than hyperglycemia alone, despite the tumor having increased glucose uptake. In adipose tissue, aromatization of estrogen results in the production of adipokines and inflammatory cytokines. And in the intestine, the enteric estrobolome, an aggregate of enteric bacterial genes whose product is able to metabolize estrogen, especially in bacteria that have β-glucuronidase and β-glucuronide, enzymes involved in estrogen deconjugation and conjugation[15].

It is already established that the negative energy balance inhibits the progression of cancer, confirmed in a double-blind study, given the decrease in leptin and the increase in sex hormone binding globulin (SHBG), which would bind to sex hormones, thus reducing the risk[16]. More recently, a mouse and human breast tissue model of reduction mammaplasty observed that obesity promotes changes in the breast tissue microenvironment that may increase cancer risk by deregulating transforming growth factor beta-1 (TGFβ1), which is an important regulator of mammary epithelial stem cells[17].

This obesogenic environment is related to the type of food intake, and foods are classified according to the level of processing and treatment they undergo into four groups: raw or minimally processed foods, processed culinary ingredients, processed foods and ultra-processed foods (represented by soft drinks, snacks, sweets, snacks, breads, etc.). In the United Kingdom, it was observed that a 10% increase in the consumption of ultra-processed foods increased the prevalence of obesity in men and women by 18 and 17%, respectively[18]. In Brazil, in a survey with 32,898 people over 10 years old, there was an increase in consumption of minimally processed and ultra-processed foods to the detriment of those rich in protein and dietary fiber[19]. This change in eating habits was also observed in the indigenous population and documented in a study evaluating 113 villages with 5,305 families in five regions of the country, and it was concluded that non-pregnant women had a rate of 30.3% overweight and 15 .8% obesity[20]. A proven fact in the patient's clinical history, dietary characteristics and BMI.

CONCLUSION

In the case presented, the late diagnosis was preponderant for the patient's death. It can be seen that only the indigenous people of North America seem to have a functioning health system. There are increasingly frequent reports of consumption of ultra-processed foods among indigenous populations in Brazil, showing a certain degree of nutritional transition they are going through. Government intervention is necessary to reduce avoidable morbidity and mortality.

AUTHORS' CONTRIBUTION

MRL: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. ALE: Formal analysis, Writing – original draft, Writing – review & editing. TYS: Formal analysis, Writing – review & editing. RLAO: Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. MVS: Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

REFERENCES

1. U.S. Department of Health and Human Services Office of Minority Health. Cancer and American Indian/Alaska Natives. 2021[cited on Feb 11, 2022]. Available from: https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=31
2. Ministério da Saúde, Instituto Nacional de Câncer. Cuidado para todos é defendido em debate no INCA. 2022 [cited on Feb 11, 2022]. Available from: https://www.inca.gov.br/
3. Rosa DD, Bines J, Werutsky G, Barrios CH, Cronemberger E, Queiroz GS, et al. The impact of sociodemographic factors and health insurance coverage in the diagnosis and clinicopathological characteristics of breast cancer in Brazil: AMAZONA III study (GBECAM 0115). Breast Cancer Res Treat. 2020;183(3):749-57. https://doi.org/10.1007/s10549-020-05831-y
4. Momenimovahed Z, Salehiniya H. Epidemiological characteristics of and risk factors for breast cancer in the world. Breast Cancer (Dove Med Press). 2019;11:151-64. https://doi.org/10.2147/BCTT.S176070
5. Instituto Brasileiro de Geografia e Estatística. Indígenas. 2022 [cited on Feb 11, 2022]. Available from: https://www.indigenas.ibge.gov.br/
6. Instituto Socioambiental. Povos Indígenas no Brasil. 2022 [cited on Feb 11, 2022]. Available from: https://pib.socioambiental.org/pt/P%C3%A1gina_principal
7. Valle FAAL, Farah BF, Carneiro Jr N. Health-interfering streets experiences: homeless people's perspective. Saúde Debate (Rio de Janeiro). 2020;44(124):182-92. https://doi.org/10.1590/0103-1104202012413
8. Aguiar Júnior PN, Stock GT, Lopes Júnior GL, Almeida MS, Tadokoro H, Gutierres BS, et al. Disparities in cancer epidemiology and care delivery among Brazilian indigenous populations. Einstein (São Paulo). 2016;14(3):330-7. https://doi.org/10.1590/S1679-45082016AO3754
9. Nascimento ER, Wanderley AV, Chalu-Pacheco F, Almeida Júnior RC, Costa DF, Pereira GNL, et al. Perfil clínico e epidemiológico do câncer entre os índios do estado do Pará, Brasil. Rev Bras Oncol Clín (São Paulo). 2015;11(39):12-18.
10. Chlebowski RT, Chen Z, Anderson GL, Rohan T, Aragaki A, Lane D, et al. Ethnicity and breast cancer: factors influencing differences in incidence and outcome. J Natl Cancer Inst. 2005;97(6):439-448. https://doi.org/10.1093/jnci/dji064
11. Borges MFSO, Koifman S, Koifman RJ, Silva IFD. Mortalidade por câncer em populações indígenas no Estado do Acre, Brasil [Cancer mortality among indigenous population in Acre State, Brazil]. Cad Saúde Pública. 2019;35(5):e00143818. https://doi.org/10.1590/0102-311X00143818
12. Soares LR, Gonzaga CM, Branquinho LW, Sousa AL, Souza MR, Freitas-Júnior R. Mortalidade por câncer de mama feminino no Brasil de acordo com a cor [Female breast ância mortality in Brazil according to color]. ver Bras Ginecol Obstet. 2015;37(8):388-392. https://doi.org/10.1590/SO100-720320150005319
13. Tamayo LI, Vidaurre T, Navarro Vásquez J, Casavilca S, Aramburu Palomino JI, Calderon M, et al. Breast cancer subtype and survival among Indigenous American women in Peru. PLoS One. 2018;13(9):e0201287. https://doi.org/10.1371/journal.pone.0201287
14. Goodwin EA, Burhansstipanov L, Dignan M, Jones KL, Kaur JS. The experience of treatment barriers and their influence on quality of life in American Indian/Alaska Native breast cancer survivors. Cancer. 2017;123(5):861-8. https://doi.org/10.1002/cncr.30406
15. Kang C, LeRoith D, Gallagher EJ. Diabetes, obesity, and breast cancer. Endocrinology. 2018;159(11):3801-12. https://doi.org/10.1210/en.2018-00574
16. Demark-Wahnefried W, Rogers LQ, Gibson JT, Harada S, Frugé AD, Oster RA, et al. Randomized trial of weight loss in primary breast cancer: Impact on body composition, circulating biomarkers and tumor characteristics. Int J Cancer. 2020;146(10):2784-96. https://doi.org/10.1002/ijc.32637
17. Chamberlin T, Thompson V, Hillers-Ziemer LE, Walton BN, Arendt LM. Obesity reduces mammary epithelial cell TGFβ1 activity through macrophage-mediated extracellular matrix remodeling. FASEB J. 2020;34(6):8611-24. https://doi.org/10.1096/fj.202000228RR
18. Rauber F, Steele EM, Louzada MLDC, Millett C, Monteiro CA, Levy RB. Ultra-processed food consumption and indicators of obesity in the United Kingdom population (2008-2016). PLoS One. 2020;15(5):e0232676. https://doi.org/10.1371/journal.pone.0232676
19. Louzada MLDC, Ricardo CZ, Steele EM, Levy RB, Cannon G, Monteiro CA. The share of ultra-processed foods determines the overall nutritional quality of diets in Brazil. Public Health Nutr. 2018;21(1):94-102. https://doi.org/10.1017/S1368980017001434
20. Coimbra Júnior CE, Santos RV, Welch JR, Cardoso AM, Souza MC, Garnelo L, et al. The first national survey of indigenous People's Health and nutrition in Brazil: rationale, methodology, and overview of results. BMC Public Health. 2013;13:52. https://doi.org/10.1186/1471-2458-13-52

This is an open access article distributed under the terms of the Creative Commons license.