

## THE INFLUENCE OF GENETIC FACTORS ON BREAST CANCER TREATMENT DECISIONS: AN EPIDEMIOLOGICAL STUDY BASED ON THE PATIENT PROFILE IN THE STATE OF PARÁ

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**Introduction:** Breast cancer (BC) is the most common malignant neoplasm among women, with a significant proportion of cases associated with genetic factors. Despite therapeutic advancements such as surgery and chemotherapy, challenges remain, including metastasis and treatment resistance. In this context, the Gail Model is used in clinical practice to estimate the risk of invasive breast cancer based on factors such as age, family history, and histological changes. Among the main hereditary genetic factors are mutations in the *BRCA1* and *BRCA2* genes, which can elevate the lifetime risk of the disease up to 80%. For women with these mutations, prophylactic measures such as risk-reducing mastectomy and bilateral salpingo-oophorectomy are recommended, typically after reproductive planning, with initiation between 35 to 40 years for *BRCA1* and 40 to 45 years for *BRCA2* mutations. This study evaluates the genetic impact on therapeutic choices for breast cancer in Pará, aiming at personalized strategies. **Objectives:** To analyze the influence of genetic factors on therapeutic decisions related to BC through an epidemiological study based on the treatment profile of patients in the state of Pará. **Methods:** This is an ecological, descriptive, and retrospective study based on breast cancer cases recorded in Pará between 2020 and 2024, using secondary data extracted from the Oncology Panel – DATASUS (Brazil). Variables such as therapeutic modality and patients age group were analyzed. **Results:** Between 2020 and 2024, there were 4,079 cases of BC in the state of Pará, of which 98.92% (n=4,035) were female, confirming the predominance of the disease among women. Of the total cases, 17.07% (n=697) were treated through surgical intervention, with 98.69% (n=688) in female patients. Some of these surgeries included risk-reducing procedures for women with genetic predisposition, even if not carriers of *BRCA1/2* mutations, suggesting that other genetic markers have also influenced therapeutic decisions. Chemotherapy was the most commonly adopted modality, accounting for 68.32% (n=2,787) of recorded treatments, with 98.35% (n=2,769) in women. Radiotherapy accounted for 1.83% (n=75) of cases, with 97.33% (n=73) in female patients. Only 2 cases (both women) received combined

treatment (surgery and radiotherapy). Additionally, 12.69% (n≈874) of records did not specify the therapeutic modality, limiting a more in-depth analysis of clinical practices. The analysis of age revealed that 50.26% (n=189) of women undergoing surgery were in the 50–59 age group, and the 40–59 range accounted for 46.48% (n=324) of surgeries performed, indicating a higher frequency of surgical decisions in ages consistent with prophylactic recommendations for high-risk women. **Conclusion:** The data highlight the prevalence of BC among women in Pará, with chemotherapy and surgery as main treatments. The higher frequency of surgeries in women aged 40 to 59 suggests genetic influence on therapeutic decisions, emphasizing the importance of genetic screening and personalized approaches in treatment.

**Keywords:** Breast cancer; risk factors; epidemiology