Risk factor profile in male breast cancer: a cohort-based assessment from a breast cancer institute in northeastern Mexico

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Introduction

Male breast cancer accounts for approximately 1.8% of all breast cancer cases worldwide and is frequently associated with delayed diagnosis and poorer prognosis compared to female patients. Men often present at older ages and with concurrent comorbidities, further complicating outcomes.

Risk factors for MBC are traditionally classified as modifiable and non-modifiable.

- Among non-modifiable factors, genetic predisposition, particularly BRCA1 and BRCA2 mutations, plays a central role, alongside family history, Klinefelter syndrome, and advanced age (>65 years).
- Modifiable factors include alcohol consumption, tobacco use, and obesity, with alcohol being consistently linked to MBC despite an unclear underlying mechanism.

Given the rarity of this disease, the characterization of local cohorts is essential to refine risk profiles, improve early detection strategies, and enhance understanding of MBC in different populations. This study aims to describe the risk factor profile of male breast cancer patients treated at a specialized breast cancer institute in northeastern Mexico.

Methods and Materials

An observational, retrospective study was conduced including eleven male patients diagnosed with breast cancer between 2016 and 2025 at a reference breast cancer institute in northeastern Mexico. A review of the literature was performed to identify relevant risk factors. Data was obtained from electronic and physical medical records and included both modifiable and non-modifiable determinants. Non-modifiable factors assessed were BRCA1/BRCA2 and other susceptibility gene mutations, advanced age, family history of cancer, and Klinefelter syndrome. Modifiable factors included alcohol use, tobacco use, obesity (BMI > 30), exogenous estrogen or testosterone use, ionizing radiation exposure, gynecomastia, bone fractures over the age of 45, and cryptorchidism. Descriptive statistical analysis was performed to summarize frequencies, percentages, and central tendency measures.

Results

A total of eleven male patients diagnosed with MBC were included in the analysis. The median age at diagnosis was 54 years, with a standard deviation of 13.92 and an age range of 34 to 74 years. Among modifiable risk factors, alcohol consumption was the most prevalent (75%), followed by tobacco use (63%) and obesity (25%) **(Chart 1.).**

With respect to non-modifiable risk factors, genetic susceptibility, defined as BRCA1, BRCA2, or other hereditary cancer gene mutations, was present in 38% of patients, while advanced age (>65 years) was documented in 27%. Additionally, 45% of patients reported a family history of cancer **(Chart 2.)** Detailed family cancer history is presented in **Table 1**. Together, these findings outline a distinct risk profile for the cohort.

Table 1. Family cancer history.

Patient ID	Patient's age at cancer diagnosis	Degree of relatedness	Relative	Cancer type
1	38	Second	Uncle	Breast
2	58	First	Father	Melanoma
			Mother	Pancreas
		Third	Paternal cousin	Breast
3	74	First	Daughter	Breast
			Brother	Colon
		Third	Cousin	Breast
4	66	First	Father	Prostate
		Third	Paternal cousin	Breast
7	63	First	Sister	Breast
			Brother	Stomach
9	34	Second	Uncle	Testicle
			Uncle	Head and Neck

Chart 1. Modifiable Risk Factors.

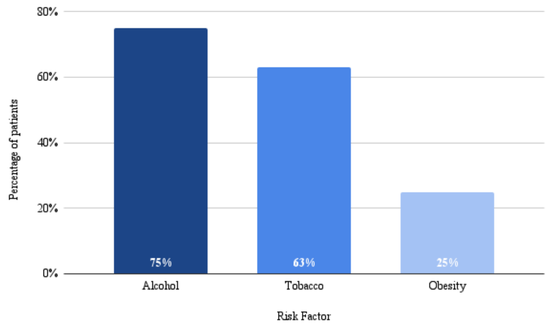
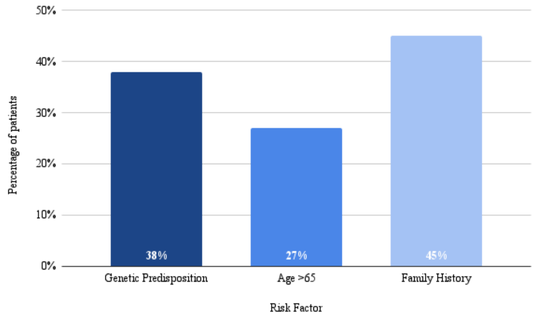


Chart 2. Non-Modifiable Risk Factors.



Discussion

This cohort demonstrates a younger age at diagnosis than typically reported in international studies, in which MBC most commonly presents after the age of 65. The high prevalence of alcohol and tobacco use highlights modifiable behaviors that may contribute to disease risk and represent important targets for prevention. The notable presence of cancer susceptibility genes and family cancer history reinforces the role of hereditary factors in MBC and highlights the need for routine genetic evaluation in male patients. These findings also emphasize the importance of clinician awareness, as early recognition of breast symptoms in men could reduce diagnostic delays. Despite the limited sample size inherent to studying a rare disease, this cohort contributes meaningful information to the limited Mexican literature on MBC and provides insight into potential avenues for screening and prevention..

Conclusions

This cohort-based assessment reveals key deviations from established literature, particularly a younger age at diagnosis, with cases occurring as early as 34 years. Modifiable risk factors such as alcohol and tobacco use were highly prevalent, suggesting important opportunities for targeted prevention efforts.

Additionally, the significant proportion of patients with family cancer history and genetic susceptibility highlights the importance of genetic counseling and comprehensive familial assessment. Although limited by its small sample size, this study adds valuable data to the scarce regional literature on male breast cancer and supports the need for larger studies to better characterize risk profiles and guide early detection strategies.

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