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Original Article

Breast Cancer Patients' Characteristics at a Tertiary Centre in Benghazi, Libya

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Abstract

Background: The most common cancer diagnosed in women between the ages of 20 and 50 is breast cancer. Changes in risk factor profiles, improved cancer registration, and early cancer identification have all contributed to an increase in its incidence and death rates over the past three decades. Obesity increases risk in women who are postmenopausal, late menopausal, and have early menarche. At the same time, breastfeeding and physical activity may reduce risk. Although they only occur in a small percentage of instances, mutations in specific genes significantly raise the risk of breast cancer. **Aim:** To describe the epidemiological characteristics among breast cancer patients at a tertiary centre in Benghazi, Libya. **Method:** A descriptive cross-sectional study, a total of 105 patients diagnosed with breast cancer were included. **Results:** The patients were aged Mean ± SD (55.4±12.7), 84(80%) were married, 53.3% BMI ≥ 30 (Obese), 32% had not breastfed their baby, 23% nulliparous, 46% with family history of breast cancer, 31.4% used hormonal therapy, 20% of them had their menarche at an age less than 12 years and 21(20%) had menopausal age higher than 48years.**Conclusion:** This study reported a high percentage of risk factors that could have an association with their disease, such as obesity, family history, parity, nulliparity, and hormonal issues. The findings also highlight a notable impact of reproductive history and hormonal therapy use.

Keywords: Epidemiology: Breast cancer :Risk factors :Benghazi

Introduction

Breast cancer is the most common cancer diagnosed in women between the ages of 20 and 50. Because of improved cancer registration, early cancer identification, and altered risk factor profiles, its incidence and death rates have risen during the past three decades [1].

As for many other cancers, the causation of breast cancer is multifaceted, but usually is tied to more general environmental factors, linked to socioeconomic conditions and lifestyles [2].

The westernisation of lifestyles (e.g., delayed pregnancies, limited breastfeeding, low age at menarche, lack of physical exercise, and bad food), improved cancer registration, and improved cancer detection are all predicted to contribute to an even higher incidence of breast cancer [3]. With an estimated 107.8 million life expectancies of the disabled (DALYs), of which 19.6 million are attributable to breast cancer, the WHO states that malignant neoplasms pose the biggest burden on women globally [4]. About 2.26 million [95% UI, 2.24–2.79 million] new cases of breast cancer were reported in 2020, making it the most prevalent cancer diagnosed in women worldwide [1,5].

Breast cancer in Libya

According to a study, there is a rise in breast cancer in western Libya. In Libya, there were 18.9 and 33.6 cases of breast cancer for every 100,000 females. The development in health care, improved diagnostic techniques (mammography, immunostaining) in Libya over the past few years, may be the cause of the incidence's apparent slow increase [6,7]. Breast cancer was the most common malignancy in female Libyans as documented by the Benghazi Cancer Registry in 2004. It represented 23% of all cancers in females [8].

In Libya, premenopausal breast cancer is more common than postmenopausal breast cancer, similar to other African countries [7]. The occurrence of breast cancer in the female Libyan population is strongly associated with young age [6,7]. With nearly 70.9% of cases arising in female individuals who are 50 years or younger. The median age is 44.0 years, and the mean

age is 46.0 years [6,7]. The frequency is higher among women who experience menarche at an early age, are breastfed for less than a year, and have a positive family history of first-degree relatives [6]. The delay of breast cancer is a serious problem in Libya. The average time between medical advice and diagnosis is long, and the diagnosis time is higher than in both developed and developing countries. Perhaps this trend can be attributed to the absence of screening programs for early detection of breast cancer in Libya [9]. Early detection of breast cancer by mammography reduces the risk of breast cancer death. It increases treatment options, including less extensive surgery and/or the use of chemotherapy

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with fewer side effects [10]. A study done in Libya (Amina M. Elsaid et al. 2023) found that about 88% of women had no previous mammogram examination, and about 35.6% of them performed a mammogram because they had breast pain, and 30.5% of women had a breast mass not for screening. The majority of participants, 77.1 %, said that what kept them from practicing a mammogram was a lack of knowledge [9]. Another study has demonstrated that 65.7% of Libyan women did not carry out the procedure as a preventive measure. The results indicated a lack of public awareness about the importance of early detection among Libyan women [11].

Breast Cancer Risk Factors

There were some factors increase the frequency of breast cancer among Libyan females, including age, family history, and menopausal status [11]. The risk of developing breast cancer is 1.5% at age 40, 3% at age 50, and above 4% at age 70 [12]. One important factor that is strongly linked to an elevated risk of breast cancer is a family history of the disease. The risk of breast cancer rises sharply with the number of first-degree relatives who have the disease, and the risk may be much higher if the affected family members are younger than 50 [13-15]. BRCA1 (on chromosome 17) and BRCA2 (on chromosome 13) are the two primary genes with strong penetrance, and they are primarily linked to an elevated risk of breast cancer [16]. Exposure to endogenous hormones, especially oestrogen and progesterone, has been strongly linked in numerous studies to an increased risk of breast cancer in women. The presence and duration of particular events such as pregnancy, lactation, the first menstrual cycle, menopause, and related hormonal imbalances are significant. Additionally, longer breastfeeding duration lowers the incidence. Younger age at first menstruation may worsen the overall prognosis. In contrast, early menopause, whether natural or surgical, reduces the risk of breast cancer [17]. In addition, women who have been on hormone replacement therapy (HRT) for more than 5 or 7 years have an increased risk of breast cancer [18].

Breast tissue density influences the risk of breast cancer. In general, the denser the breast tissue, the higher the risk of breast cancer. This trend is seen in both premenopausal and postmenopausal women [19]. A personal history of breast cancer increases the risk of cancer recurrence in the breast. Histologic classification of benign lesions of breast cancer is a factor increase the prevalence of breast cancer [20]. Patients between the ages of 10 and 30 who

have received high doses of radiation therapy to the chest, such as for Hodgkin lymphoma, have a higher risk of developing breast cancer [21]. Regular physical activity is thought to be a protective factor against the development of breast cancer. Observed that physical activity was associated with reduced cancer risk in women with a family history of breast cancer, but only in the postmenopausal period [22]. Obesity is associated with an increased risk of breast cancer. Women over age 50 with a high body mass index (BMI) were shown to have a higher risk of cancer than women with a lower BMI [23].

As breast cancer is the first cancer among Libyan women, and there was a delay in diagnosis, with a specific increased frequency of some risk factors, and no awareness about early detection methods for the disease, this study aimed to briefly describe the epidemiological characteristics of patients diagnosed with breast cancer, and the prevalence of all the mentioned risk factors among Libyan women attending the tertiary centre in Benghazi

Methods and Patients

This cross-sectional descriptive study involved all (105) patients with confirmed breast cancer. Participants were recruited via convenience sampling at the Benghazi Tertiary Medical Centre's Oncology Unit during June 2023. This sample size was exploratory.

Data collection used a self-constructed questionnaire to capture socio-demographic profiles (age, education, residence, marital status) and clinical risk factors, including BMI, reproductive history (parity, menarche, menopause, and breastfeeding history), family history of breast cancer, and use of hormonal therapies.

All the patients had measured their weight and height and then calculated their BMI, which was categorized as underweight (BMI < 18.5), normal (18.5- 24.9), overweight (25-29.5), and obese (≥30).

Data were computed using the Statistical Package of Social Science (SPSS) version 25. These were purely descriptive statistics, such as frequencies, percentages, means, and standard deviations.

Ethical consideration

Each patient was given an idea of the goal of the research, clarification of the questions was provided easily, and verbal consent was taken, with confidentiality concerns addressed

Written consent was taken from the oncology unit authority, and ethical approval was obtained from the Libyan International University Ethics Committee.

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Result

A total of 105 patients were included in this study; women's ages ranged between 34 and 89 years. The mean age was 55.4 years ±12.7, 84(80%) were married, 34(32.4) had secondary education, and 79 (75.2%) lived in Benghazi city. Table 1

The study showed that 48 (46%) reported a family history of breast cancer, 24 (23%) of patients did not

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achieve parity, and 34(32%) had not breastfed their babies, 21(20%) of them menarche at age less than 12 years, 33(31.4%) premenopausal, 20(19%) had menopausal age higher than 48years, and 33(31.4%) used hormonal replacement therapy. Table 2. The study found that the majority of patients were overweight (n=32, 30.5%) or obese (n=56, 53.3%). Figure 1

Discussion

The study reported that the mean age was 55.4 years ± 12.7, which was higher than the mean age reported in previous Libyan studies in Tripoli, 46 years ± 11.7 [6]. Unmarried women, especially lifelong single women, had a higher risk of developing breast cancer than married and divorced women [24]. In this study, about 19.1% of the cases were single, which is close to the results of a previous Libyan study [6]. It demonstrated that several recognized breast cancers associated factors were highly prevalent among Libyan women diagnosed with breast cancer, particularly positive family history (46%), obesity and overweight (83.8% combined), nulliparity (23%), absence of breastfeeding (32%), early menarche (20%), late menopause (19%), and hormonal replacement therapy (31.4%). These findings are consistent with the multifactorial nature of breast cancer reported globally and regionally, where genetic susceptibility, reproductive history, and hormonal exposure, which could collectively shape disease occurrence, rather than acting as isolated determinants.

Family history was one of the most prominent findings in this study, with nearly half of the participants reporting a positive family history of breast cancer. This proportion is higher than that reported in earlier Libyan studies, where family history ranged from 21% to 30% [8,25],

and is also higher than reports from some neighboring North African countries, such as Egypt and Tunisia, where positive family history among breast cancer patients ranged between 18% and 35% [26,27]. Globally, first-degree family history remains one of the strongest non-modifiable associated factors, with women carrying BRCA1 or BRCA2 mutations showing substantially elevated lifetime risk [28,29]. A recent systematic review from the Middle East and North Africa (MENA) region further emphasized that hereditary and molecular mutations are increasingly recognized contributors to earlier and more aggressive breast cancer presentation in Arab women [30]. Therefore, the high prevalence observed in this study may reflect a significant hereditary burden among Libyan patients.

Obesity and overweight represented the most frequent modifiable findings, with 53.3% of women being obese and 30.5% overweight. This is comparable to recent African and MENA studies showing obesity as one of the most consistent metabolic factors associated with breast cancer, particularly after menopause [31,32]. A 2025 African systematic review reported that obesity was strongly associated with postmenopausal breast cancer across multiple African populations, while a 2023 meta-analysis confirmed that BMI >30 significantly increased breast cancer occurrence, especially among postmenopausal women [31,33]. Similar findings were reported in a recent Libyan study that identified obesity and BMI elevation as major associated factors among breast cancer patients [34]. Adipose tissue contributes to estrogen production through peripheral aromatization, and obesity is also linked to chronic inflammation, insulin resistance, and altered adipokines, all of which may influence carcinogenesis [35]. The relatively older age distribution in this study further supports this commonly reported postmenopausal obesity pattern.

Reproductive factors also showed important associations. Nulliparity was observed in 23% of patients, consistent with previous evidence suggesting that women who have never given birth are more frequently represented among breast cancer cases [36]. Regional studies from Saudi Arabia and Egypt similarly reported higher breast cancer occurrence among nulliparous women or those with delayed first pregnancy [37,38]. Pregnancy is believed to induce terminal differentiation of breast epithelial cells, reducing susceptibility to malignant transformation and lowering cumulative estrogen exposure [39]. Thus, the nulliparity pattern observed here aligns with established reproductive epidemiology.

Breastfeeding patterns also remain clinically relevant. In this study, 32% of women had not breastfed, while 68% had a history of breastfeeding. Global pooled analyses have consistently shown that breastfeeding exerts a protective effect against breast cancer, particularly when prolonged beyond one year [40]. A collaborative reanalysis demonstrated that each additional year of breastfeeding was associated with reduced breast cancer occurrence [41]. Similar findings were reported in MENA populations, where shorter breastfeeding duration was associated with higher breast cancer frequency [42]. Although the majority of women in this study had breastfed, the coexistence of obesity, family history, and hormonal exposure suggests that breastfeeding alone may not offset the cumulative influence of stronger associated factors.

Hormonal exposure through early menarche, late menopause, and hormonal replacement therapy (HRT) was also notable. Early menarche before 12 years was reported in 20% of participants, while 19% experienced menopause after 48 years, both reflecting prolonged lifetime estrogen exposure. Similar reproductive profiles have been reported in Libyan and regional studies [25,37].

Estrogen-driven epithelial proliferation increases cumulative exposure to mitotic activity in breast tissue, which has been associated with higher cancer risk [43]. Additionally, 31.4% of patients reported HRT use, which

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is comparable to recent findings from Libyan and MENA studies where prolonged HRT exposure was linked to higher breast cancer frequency [34,44]. In Libya specifically, breast cancer accounts for a major proportion of female malignancies, and several recent reports emphasize obesity, family history, and hormonal factors as recurrent associated variables [34,45].

Overall, the coexistence of hereditary predisposition, reproductive history, hormonal exposure, and obesity among these patients supports the multifactorial epidemiology of breast cancer in Libyan women. The recruitment from a tertiary oncology unit likely overrepresents women with more advanced or complex disease, potentially inflating observed risk factor frequencies.

Limitation

The study employs a cross-sectional design with convenience sampling, which limits the ability to establish causal relationships and generalizability. Without a control group of women without breast cancer, the study cannot determine whether observed risk factor frequencies are elevated compared to the general population. A small sample size, single-center setting, and the absence of inferential statistics could limit the study.

Conclusion

The study population was characterized by a high prevalence of both modifiable and non-modifiable risk factors. Most notably, a staggering 83.8% of patients were either overweight or obese, and nearly half (46%) reported a family history of breast cancer. Additionally, significant proportions of the cohort exhibited prolonged estrogen exposure through early menarche, late menopause, and hormonal replacement therapy.

Recommendations

- While the descriptive design of this study does not allow causal inference, the findings highlight the need for stronger prevention strategies focused on weight control, family-based screening, reproductive counseling, and awareness of hormonal risk factors.
- Future multicenter case-control studies with molecular profiling are needed to better quantify the independent contribution of these factors and to strengthen breast cancer prevention strategies in Libya.

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Conflict of Interest

The authors declare that they have no conflict of interest

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