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Breast Cancer Risk Assessment among Bahraini Women

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Objective: **To estimate breast cancer risk among Bahraini women aged 35 years and older attending primary healthcare centers.**

Setting: Primary healthcare centers.

Design: Cross sectional descriptive study.

Method: One hundred seventy-two women aged 35 years and older were assessed for the risk of invasive breast cancer risk using the modified Gail model. The study was performed from 1 February to 31 May 2005. A questionnaire was used to collect information on five years and lifetime breast cancer risks.

Result: Four percent of the women had a high risk (≥1.76%) of breast cancer making them eligible for breast cancer health prevention strategies. A mean of 5 years risk (0.7% ± 0.37) and a mean of lifetime risk (9.3% ± 3.0) were computed.

Conclusion: **Four percent of the women aged ≥35 years had high breast cancer risk based on the Gail model which makes these women eligible for preventive strategies and close follow-up by specialists in the field.**

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A number of statistical models had emerged in order to predict the risk of cancer occurrence[1]. Researchers had published during the late 1980s and early 1990s models for breast cancer absolute risk prediction[1]. Those models can help in population cancer control strategies and identifying individuals at high risk[1].

Gail M et al used the data from Breast Cancer Detection Demonstration Project (BCDDP) to develop a model for the estimation of breast cancer risk among women in a program of annual mammographic screening[2]. The model estimates the absolute risk that a woman will develop invasive ductal carcinoma in situ [DCIS] or lobular carcinoma in situ [LCIS] over a defined age interval. Statisticians of the National Surgical Adjuvant Breast and Bowel Project (NSABP) modified the Gail model to project the absolute risk of developing only invasive breast cancer. The modified Gail model calculates the 5 years and lifetime breast cancer

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relative risks for women 35 years or older[2-4]. Furthermore, the modified model included estimation of the risk for African American women who were not previously included in the original program. The modified model was used to define eligibility criteria for the Breast Cancer Prevention Trial (BCPT)[5].

The National Surgical Adjuvant Breast and Bowel Project (NSABP) did a validation study for Gail model; it proved that the Gail model was scientifically validated[2].

Table 1: Relative Risks Associated with Breast Cancer Risks Factors as Determined in the Original Gail Model

Category A: Age at Menarche	**Relative Risk**
≥ 14 years	1.00
12 - 13 years	1.10
< 12 years	1.21
Category B: Number of Breast Biopsies/Women's Age	
0/Any age	1.00
1/< 50 years	1.70
1/≥ 50 years	1.27
≥ 2/< 50 years	2.88
≥ 2/≥ 50 years	1.62
Category C: Number of First Degree Relatives with Breast Cancer/Women's Age at First Live Birth	
0/< 20 years	1.00
0/20 - 24 years	1.24
0/25 - 29 years or nulliparous	1.55
0/≥ 30 years	1.93
1/< 20 years	2.6
1/20 - 24 years	2.68
1/25 - 29 years or nulliparous	2.76
1/30 years	2.83
≥ 2/< 20 years	6.8
≥ 2/20 - 24 years	5.78
≥ 2/25 - 29 years or nulliparous	4.91
≥ 2/≥ 30 years	4.17

Women at greater risk of developing breast cancer should be identified by their physician, taught the techniques of BSE and followed-up carefully. Women with an exceptional breast cancer family history should be counseled and given the option of genetic testing. Some of these high-risk women might consider prophylactic mastectomy or tamoxifen[7]. Prophylactic mastectomy risk reduction is more than 90% in women with strong family history of breast cancer[8]. Furthermore, prophylactic oophorectomy has been effective in reducing breast cancer risk in women with a known BRCA1 or BRCA2 mutation. Removing the ovaries in premenopausal women diminishes the amount of estrogen circulating which could stimulate breast cancer cells; the risk has been reduced by approximately 50%[9].

Chemoprevention is described as the use of specific natural and synthetic chemical agents to reverse or suppress carcinogenesis and prevent the development of invasive cancer. The agents used for chemoprevention are a group known as selective estrogen receptor modulators (SERMs). Tamoxifen is the most widely prescribed SERM, and raloxifene currently is being evaluated for its effectiveness in preventing breast cancer development. SERMs act as estrogen antagonists in some tissues (e.g. bone, endometrial and breast)[10].

The NSABP conducted the Breast Cancer Prevention Trial (BCPT), which studied the efficacy of Tamoxifen as a preventive agent in women who never had breast cancer but were at high risk of developing the disease. Women who received Tamoxifen for 5 years had about 50% reduction in non-invasive and invasive cancers compared with women taking placebo[7].

The aim of the study was to identify breast cancer risk among Bahraini women in a primary healthcare setting.

METHOD

Women were selected from five health centers distributed in different regions of Bahrain. The selection criteria were as follow: women whose age 35 years and older were identified from randomly chosen sample taken from five health centers in the Kingdom of Bahrain. The original sample of 300 women included women of Bahraini nationals who attended the health centers for medical condition or who accompanied the patient. The five health centers were selected using a cluster sampling technique and it was stratified according to the percentage of females residing in each area[11].

Women aged 35 years and older who attended the selected primary healthcare centers were interviewed using an anonymous, mostly closed ended Arabic questionnaire by one of the authors. There was no prior knowledge of breast cancer history prior to the interview. Consent was taken from each woman, and it was explained to them that the information will be confidential and used only for research purposes.

Breast cancer risk was calculated for one hundred seventy-two women aged 35 years and older using modified Gail model. The 5 years and lifetime estimated risks for invasive breast cancer were calculated for these women and compared with women of the same race and average risk factors. Women who had estimated 5 years risk of 1.7 or more were considered at high risk based on the model.

The variables used for estimation of breast cancer risk in the modified Gail model were women's age, first menstrual period, age at first live birth, number of first degree relatives who had breast cancer, history of breast biopsy, number of previous breast biopsies (positive or negative), having at least one biopsy with atypical hyperplasia and the race/ethnicity of women if known. An unknown race/ethnicity variable was used for all the women in this study in estimating their risks.

RESULT

Based on the modified Gail model, the women had a mean of 5 years risk of 0.7% ± 0.37 and a mean of lifetime risk of 9.3% ± 3.0. The minimum and maximum values were 0.2%, 2.4% and 4.9%, 30.8% for the 5 years and lifetime risks, respectively. In comparison with women of the same age and average risk factors, 19 (11%) had a higher 5 years risk and 14 (8.1%) had higher lifetime risk, see table 2.

Table 2: Women Aged 35 Years and More, 5 Years and Lifetime Risks

Levels of Risk	5 Years Risk	Lifetime Risk
	Number & Percentage	
Higher	19 (11)	14 (8.1)
Equal	34 (19.8)	1 (0.6)
Lower	119 (69.2)	157 (93.3)
Total	**172 (100)**	**172 (100)**

The Gail model qualifies women 35 years and older for breast cancer prevention trial if they had 5 years risk of invasive breast cancer of 1.7% or higher. In this study, of the 19 women who had 5 years higher risk, only 7 (4%) were qualified for breast cancer chemoprophylaxis intervention. The age of these seven women ranges from 39 to 51 years. Their risk range was 0.6%, a minimum of 1.8%, a maximum of 2% and a mean of 2%.

DISCUSSION

The mean estimated 5 years risk of 0.7% is half of that reported among the primary care US population[12]. The obtained rate is similar to the lower range of 0.77% to 1.18% found at US gynecology clinic and similar to the mean of 0.68% reported in another US gynecology clinic[13-14].

On the other hand, the mean lifetime risk of 9.3% found in this study is similar to 8.4% reported by David et al among US women attending primary healthcare facilities and higher than the upper range of 5.4% to 8.5% found among women with gynecological diseases[12,13]. Thus, the calculated breast cancer risks in this study are comparable to other studies and provide basic information for future assessment of risks.

The percentages of women in this study who had high 5 years and lifetime risks were 11% and 8.1% respectively compared with women of the same age and average risk factors according to Gail's breast cancer risk model. Furthermore, 4% of the women 39-51 years old were having 5 years risk of ≥1.7%; therefore, these women are eligible for breast cancer prevention strategies. Those women were given an advice to consult breast cancer surgeon. Higher rates of 9% and 11% were found among white American women in a primary care setting (9.0%) and among women with gynecological cancer[15,16]. A higher percentage of women (15.7%) was found among national group of 2000 women in USA[17]. Compared to the current study, lower percentages of women (2.5%) were having 5 years risk of ≥1.7% at a Chicago gynecology clinic[14].

CONCLUSION

Four percent of the women aged ≥ 35 years had high breast cancer risk based on the Gail model which makes these women eligible for preventive strategies and close follow-up by specialists in the field. Thus, Bahraini women at primary care setting should be given the opportunity to assess their risk for breast cancer and provide them with counseling in addition to breast cancer screening procedures.

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