Assessment of Breast Cancer Risk by Gail Model in Women of Thi-Qar

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Abstract

The aim of current study to assess the high incidence of breast cancer (BC) and the effect of its earlydiagnosis on decreasing morbidity and mortality among Iraqi women. A descriptive cross-sectional study was conducted and data were collected from 106 women in Thi-Qar by a questionnaire consisted of demographic and breast cancer risk (BCR) factors questions. Brest cancer risk was calculated using the BCR Assessment Tool (BCRAT) of the National Cancer Institute's online version (Gail Model).Results: The average age of women was 43.44± 11.3 years. Ten (9.4%) women have first degree relatives who had BC and five of them have more than one. Fifty (45.3%) had their menarche at 12–13 years of age,32 (29.2%) had their first birth at 20-24 year of age. The mean five year BCR for all women was 1.25± 1.46%, and 15 (14.15%) of them had a five year BCR >1.7%. Mean lifetime BCR up to age 90 years was 13.11± 12.76% and 8(7.54%) women had high risk. Based on these findings, it may be suggested that Gail Model for BCR assessment can help healthcare providers in Iraq to estimate an individual's probability of developing BC for early detection and prevention.

Keywords: *Gail model; Breast cancer; Thi–Qar.*

Introduction

Breast cancer is the most common type of cancer in women. It is estimated that about 1.4 million new cases every year all over the world, and this disease accounts for about 25% of all cancer cases in women and is the second most common after lung cancer. This can happen in men, but this is uncommon. The incidence of this disease is much higher in developed countries than in developing countries (IARC, 2010). Incidence is increasing rapidly in many newly industrialized countries due to changing lifestyles in developed countries [1]

In 2010, it was recorded that 721 of the women who underwent a breast examination at the examination center for early detection of breast cancer in Iraq, 143 cases of this disease were diagnosed (19.8%). Although 90.6% of women initially self-discovered these lumps, Another study conducted in 2012 to explore the knowledge, attitudes and practices towards breast cancer in a sample of educated women, revealed that nearly half of the participants had a low knowledge score for this disease (less than 50%). The study indicated that 90% of the participants heard about breast self-examination (BSE), however, we only found only 43% of them practiced this technique[2].

First type assesses the likelihood of BRCA mutations such as the Claus model where all predictions are based only on family history [3] The second type of risk factor used in BC includes the Gail model (GM) and the modified model (GM2) that calculates 5-invasive BCR and lifetime [4]] GM is the most widely used risk prediction mode and the land has been studied, validated and applied in various studies around the world [5-7] So the aim of the current study was to apply GM2 to the Iraqi population and assess whether it could be used to assess BC prediction for women Iraqi women.

Materials and Method

This study is a cross-sectional design and descriptive . The data were collected from 106 women who had applied to Bint Al Huda Hospital in Thi-Qar, a city in southern Iraq. The purpose of the study was explained to each woman and those who refused to participate

were excluded. A total of 106 women in the ages of 35 years and older were included and data were collected between May and Jane 2020.

The questionnaire was used in this study based on the online version of the National Cancer Institute's Breast Cancer Risk Assessment Tool (BCRAT)also known as Gail Model available at (http://www.cancer.gov/bcrisktool/) which has questions about the five-year and lifetime BC risk based onage, age at first live birth, age at menarche, first degree relative numbers with BC, previous breast biopsies with or without atypical hyperplasia, BRCA mutations and woman race[8]

The questionnaire also had additional questions about sociodemographic features such as occupation, education,marital status, family income and husband education level. Unknown BRCA mutations and the white race/ethnicity(Caucasian) variables were used for all the women in this study in estimating their risks[9] For five-year risk assessment, a rate of 1.7% or less was defined as low risk while a rate of 1.7% or more was defined as high risk[4,9] Lifetime risks were classified as usual(<15%), moderate (15–30%), or strong (>30%)[10,11] Descriptive statistics including the mean, standard deviation and percentage was used to analyze data.

Results

The socio-demographic features studied showed that 39(36.8%) of the women had completed primary, secondary or high schools and 59 (54.7%) had completed diploma, college or postgraduate studies, and of their husbands there were 47 (55.6%) completed diploma, college or postgraduate studies and 39 (40.2%) completed primary, secondary or high schools. Thirty eight (34.9%) were teaching staff and 53(50.9%) housewives. There are 81 (75.5%) married, 8 (7.6%) unmarried, 9 (9.4%) divorced and 8 (7.9%) widow. About 12 (14.4%) of them had high level family income, 85(77.4%) had middle level and 9 (8.5%) had low level income (Table 1). The five-year and lifetime BCR variables studied showed that the mean age of women was 43.44± 11.3 years (range 35–67 years) and that 50 (45.3%) of the participants had their menarche at the age of 12–13 years, 32 (29.2%) of women had their first live birth between the ages of 20–24 years and 22(19.8%) between 25–29 years. There were 10 (9.4%) of the participants reported having first degree relatives who had diagnosed with breast cancer. Only 5 (3.8%) women reported two first-degree relative with breast cancer, four (4.7%) had undergone one breast biopsy and 8(8.5%) had more than one. five of the participants reported having atypical hyperplasia (Table 2).Based on the modified Gail model, the women in this study had a mean five years risk of 1.25± 1.46 and a mean of lifetime risk of 13.11± 12.76%. The minimum and maximum values were 0.3%, 7.1% and 3.7%, 39.6% for the five years and lifetime risks, respectively. In comparison with women of the same age and average risk factors, 19 (7.6%) had a higher five years risk and 6 (2.4%) had higher lifetime risk (Table 3).

Table 1: Socio demographic information about the women included in the study, 35 years and over (N=106)

Occupation	Martial status	Family income	Education level	Husband educ. Level
Teaching staff (38)34.9%	Married (81)75.5%	Low (9)8.5%	Prim.School (23)20.8%	Prim. School (14)14.4%
Employees (12)11.3%	Unmarried (8)7.6%	Middle (85)77.4%	Med.school (11)11.3%	Med .school (12)12.4%
Workers (1)1%	Divorced (9)9.4%	High (12)14.1%	High school (5)4.7%	Highschool (13)13.4%
Students (2)1.9%	Widow (8)7.5%		Diploma (16)14.2%	Diploma (9)10.3%
Housewives (53)50.9%			College (20)16%	College (28)27.8%
			Higher study (23)24.5%	Higher study (10)17.5%
			Uneducated (8)8.5	Uneducated (5)4.2%

Table 2: Women risk factor values used in the BCRAT in women, 35 years and over (N=106)

Age	Age at menarche	At a first live birth	No. of first degree relatives with BC	Having a biopsy
35-44 (59) 52.8%	Unknown(24) 23.6%	Not married(8) 8.5%	One relative (10) 9.4%	One biopsy (4)4.7%
44-54 (34) 30.2%	7-11 (4)3.7%	Unknown(2) 1.9%	>One relative (5) 3.8%	>One biopsy (8) 8.5%5 had atypical hyperplasia

Age	Age at menarche	At a first live birth	No. of first degree relatives with BC	Having a biopsy
55-64 (12) 16%	12-13(50) 45.3%	No birth (6) 5.7%	Zero relative 91(85.84%)	
>65 years (1) 1%	>14(28) 27.4%	>20years(20) 19.8%		
		20-24years(32) 29.2%		
		25-29years(22) 19.8%		
		>30(16) 15.1%		

Table 3: Calculated BCR in women,35years and over (N=106)

Five years risk Number and percentage	**Lifetime risk**
Standard of Gail Model 1.02%	Standard of Gail Model 11.21%
Mean of five-year risk of all Women 1.25± 1.46%	Mean risk of all women up to age 90 years 13.11± 12.76%
Low risk 91(85.84%)	Usual risk 91(85.84%)
High risk 15 (14.15%)	Moderate risk 7(6.60%)
	High risk 8(7.54%)

Discussion

With the increase in breast cancer rates in Iraq, it is important to screen for women at high risk for early detection and prevention. Biostatistician Mitchell Gill developed a mathematical model in 1989 to assess the risk of BCR based on the results of a large screening study of 284,780 women who underwent annual mammography screening, and because of the reliability and validity of the GM., It was used in the current study[18].

As 18.1% among the USA women over the age of 40 in Mermer and Meseri study whereas it was 2.5% among the women aged 35–60 in Abu-Rustum et al. study[12,13]. Ewaid and Al-Azzawiin their study[14] found that the five year risk rate in Iraqi women was 0.95% and the lifetime risk was 11.134%. Fikreeand Hamadeh[15] reported that the five year risk in Bahraini women was 0.7% and the lifetime risk was 9.3%. Erbil et al[16]

The Gail model qualifies women age 35 and older to try BC prevention if they have a five-year risk of 1.7% or more. In this study, there were 15 women who had a 5-year higher risk. Therefore, these women are eligible for BC prevention

Strategies. Iraqi Cancer Council statistics showed an increase in the incidence of BC in young Iraqi women [ICB, 2010]. In this study, although the risk at five years and during ninety years of life was lower than the standard for the Gail model, those with a Gail score equal to or greater than 1.7% were considered high risk and recommended regular mammograms. [17,18] Chemoprophylaxis[32] and even prophylactic mastectomy [18,17].

Conclusion and Recommendation

Women's Iraqi should be given the chance to survey their risk of BC and give them direct screening strategies. The relationship between the possibility of ethnic differences and the environmental pollution might affect the applicability of the Gail model, so these factors must be studied well.

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Conflict of Interest: None to declare

Ethical Clearance: All experimental protocol were approved under university of Thi-Qar collage of education for pure sciences, biology department and all experimental carried out accordance with approved guidelines

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