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# Breast cancer risk assessment in Iranian women by Gail model

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## Abstract

**Background**: Due to the high incidence of breast cancer and the effect of its early diagnosis on decreasing morbidity and mortality, we used the Gail model to study breast cancer risk in Iranian women.

**Methods**: This study was done in a simple randomized way. Participants were 2000 Iranian women older than 35 years old. The questionnaire consisted of demographic data such as age, race (optional ) marriage status , level of education and standard questions of the Gail model. Gathered data were given in http://bcra. nci. nih.gov/brc. The breast cancer risk was calculated within the next 5 years and within the 90 years life span. The statistical analysis was done by SPSS software.

**Results**: Mean age of women in the study was 47.95 years .50% of women had their menarche at/older than fourteen years of age. 50% of women had first childbirth in their twenties. 87% had a negative family history of breast cancer. 94% had no history of breast biopsy. Of the remaining 6%, no tissue atypia was reported. In the present study, breast cancer risk within 5 years was 0.92% and the breast cancer risk within 90 years of life was 9.14%. 7% showed risk of more than 1.67% in the Gail model. The age ranged between 55-65 years in this high risk group.

**Conclusion**: In our study of breast cancer risk in Iranian women, breast cancer risk was lower than the control group in the Gail model estimate for 5 years and a 90-year life span. (0.92% versus 1.02% , 9.14% versus 11.21%). The differences were statistically significant ($p<0.001$)

**Keywords**: breast cancer, risk assessment, Gail model, high risk.

## Introduction

Breast cancer comprises about 33% of cancers in women. It is also the most common cause of cancer-related death in women 40-44 years old [1,2]. Breast cancer occurs in 1 out of 8 women. So breast cancer risk assessment and the recognition of high risk individuals in the society, prompted researchers to use risk assessment models such as the Gail model [1-4].

Recognition of high risk individuals of breast cancer leads to implementation for social policies for screening, prevention, early diagnosis and less radical treatment modalities that in themselves lead to increased 5-year survival rates in high risk persons [5,6]. In multiple studies, the validity and reliability of the Gail model for breast cancer risk assessment has been proven. We, therefore, used the Gail model in our study [5,8].

## Methods

This study was done through a simple ran-

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domized process. There were 2000 women who participated in the study who were older than 35. The questionnaire consisted of demographic data such as age, race (optional), marriage status, level of education and standard questions of the Gail model. Then the gathered data of each participant were given to http://bcra.nci.nih.gov/brc.

The breast cancer risk was calculated within the next 5 years and within 90 years of life span, Statistical analysis was done by SPSS software. The variables were analysed by T, $\chi^2$ and Fischer tests. In high risk individuals with an index of equal or more than 1.67 percent of breast cancer risk assessed by the Gail model, strict recommendation for regular breast examination, mammography, and consultation for chemoprevention was given.

| Age (yrs) | No. (%) of participants |
|---|---|
| 35-45 | 999 (50) |
| 46-55 | 640 (32) |
| 55-65 | 255 (12.8) |
| >65 | 106 (5.2) |
| Total | 2000 (100) |
| Education | |
| None | 93 (4.6) |
| High school qualified or lower | 918 (46) |
| University qualified | 634 (31.7) |
| Not specified | 355 (17.7) |
| Total | 2000 (100) |
| Occupation | |
| None | 1024 (51.2) |
| Employed | 584 (29.2) |
| Self-employed | 10 (0.5) |
| Retired | 57 (2.9) |
| Not specified | 325 (16.2) |
| Total | 2000 (100) |
| Race (optional) | - (--) |

Table 1. Demographic data of participating women.

## Results

The mean age of women participating in the study was 47.95 years. About 50% of women had their menarche at/older than fourteen years of age. About 50% of women had their first childbirth in their twenties. 87% of women had negative family history of breast cancer. 94% of participants had no history of breast biopsy. Of the remaining 6%, no tissue atypia had been reported.

In the present study, breast cancer risk within 5 years was 0.92 percent and the breast cancer risk within 90 years of life was 9.14 percent. Seven percent of participants showed a risk of more than 1.67 percent in the Gail model. The age ranged between 55-65 years in this high risk group.

| Age (yrs) | No. (%) of participants |
|---|---|
| 35-45 | 999 (50) |
| 46-55 | 640 (32) |
| 55-65 | 255 (12.8) |
| >65 | 106 (5.2) |
| Mean age | 47 ± 9.5 years |
| Age at menarche | |
| <12 | 144 (8) |
| 12-13 | 834 (41) |
| 14≤ | 1022 (51) |
| Breast cancer in 1st degree-relatives | |
| No. history | 1739 (87) |
| 1 | 217 (10.8) |
| 2 | 41 (2.1) |
| 3 | 3 (0.1) |
| Age at 1st live birth (yrs) | |
| No pregnancy | 41 (2.1) |
| <20 | 1032 (51.6) |
| 20-24 | 555 (27.7) |
| 25-29 | 282 (14.1) |
| 30< | 90 (4.5) |
| Breast biopsy | |
| No biopsy | 1878 (94) |
| Once | 94 (5) |
| Twice | 13 (0.5) |
| 3 times | 3 (0.1) |
| 5 times | 12 (0.4) |
| Atypia reported | 3 (2.38) |

Table 2. Gail model representations in Iranian women in the study.

## Discussion

This study was performed to assess the breast cancer risk in Iranian women older than 35. Due to the proven reliability and validity of the Gail model, this model was used in the present study [5,8], which takes into account factors such as age, age at menarche, breast biopsy, age at 1st childbrith and the presence of breast cancer in

| Breast cancer risk assessed | In the current study | Standard of Gail model | Mean difference | t | df | P value |
|---|---|---|---|---|---|---|
| 5-year risk of breast cancer | 0.92% | 1.02% | 0.10% | 3.98 | 3998 | P<0.001 |
| 90-year risk of breast cancer | 9.14% | 11.21% | 2.07% | 19.72 | 3998 | P<0.001 |

Table 3. Breast cancer risk assessed by Gail model in this study.

first degree relatives of the participating woman. In this model the cumulative risk of breast cancer is calculated in the corresponding decade of life.

Statistics show an increasing incidence of breast cancer in the younger age in Iranian women [9,10]. Although in most cases in our study the risk of breast cancer within 5 years and within the 90 years life span was lower than the standard controls in the Gail model, those who had a Gail score of equal or more than 1.67 percent were regarded as high risk

The high risk group of breast cancer risk assessment were seriously recommended to have regular breast examinations, mammography [11,12], chemoprevention [13-15] and in some situations, prophylactic mastectomy was discussed too [16].

In spite of the high acceptance of mammography in our study, the participating women in the high risk group had less compliance towards tamoxifen as a chemopreventive drug.

We believe that similar studies can be employed to adopt relevant policies in emphasizing clinical breast examinations, screening for breast cancer and chemoprevention with tamoxifen to decrease the incidence of advanced breast cancer in developing countries.

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