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Breast Cancer Risk Assessment and Gail Model among Chinese Women

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Abstract

Purpose: The Gail Model has been used to quantify an individual woman's risk of developing breast cancer with clinical parameters; however, limited information has been available for application of this model among Chinese women. The aim of the present study was to estimate the five-year and lifetime breast cancer risk among women in Shanghai, China.

Materials and Methods: In this cross-sectional study, a total of 2,340 women residing in Shanghai, China participated using the Gail Model to estimate their relative risk for breast cancer. Participants were ≥35 years of age without a history of breast cancer.

Results: The mean age of the study subjects was 52.5 ± 10.8 years. Eighty-one women (3.5%) were classified as high-risk because their estimated five-year risk was over 1.66%. The estimated mean values for the five-year risk and lifetime risk for breast cancer were 0.73 ± 0.009% and 5.25 ± 0.005% respectively among study participants. For the lifetime risk, 17.6% of the women participants had a higher risk than the average woman. The risk increased with age and the history of breast cancer in the family among the study sample.

Conclusion: Overall, Chinese women in this study population were found to have comparable five-year risk of breast cancer but a lower lifetime risk based on the risk assessment of the Gail Model. Considering the rapid increase in breast cancer incidence in recent decades in China, the development of breast cancer models targeting the Chinese female population is needed.

Keywords: Breast Cancer; Chinese; Risk Estimation

risk, and the results from risk assessment can be used to develop an individualized plan to assist patients in decision-making regarding the implementation of frequent surveillance, chemoprevention, or prophylactic surgery. Screening mammography had been proved effective in reducing the mortality rates [10,11]; nevertheless, a population-based screening program has not been implemented in China as in the U.S. and other Western societies. In addition, the mean age for breast cancer diagnosis in China is 10 to 15 years earlier than in western countries [12]. Prioritizing breast cancer screening and diagnostic work-up for abnormalities can be particularly important, especially in low- and middle-income countries such as China, in the formation, implementation and coordination of breast cancer prevention, education, screening, and treatment program.

Despite its limitations, the Gail Model has been widely used to calculate a woman's risk of developing breast carcinoma. Based on the information from 284,780 Caucasian women participating in the Breast Cancer Detection Demonstration Project from 1973–1980, Gail et al. [13] developed a mathematical model that provides individualized risk estimates of developing breast carcinoma with varying risk factors, including age, age at menarche, number of prior breast biopsies, age at first live birth, and number of first-degree relatives affected with breast cancer. Relative risk was calculated for each of these risk factors; these relative risks (i.e., the probability of developing breast cancer in a given population)

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