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Full Length Article

Breast cancer correlates in a cohort of breast screening program participants in Riyadh, KSA

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KEYWORDS

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Abstract *Background:* Breast cancer is the first cancer among females in the Kingdom of Saudi Arabia, accounting for 27.4% of all newly diagnosed female cancers in 2010. There are several risk factors affecting the incidence of breast cancer where some factors influence the risk more than the others.

Aim: We aimed to identify the different risk factors related to breast cancer among females participating in the breast-screening program in Riyadh, KSA.

Methods: Based on data from phase-I of the breast-screening program, a case–control study was conducted on women living in Riyadh, KSA. A sample of 349 women (58 cases and 290 controls) was recruited to examine the different breast cancer correlates. Multivariate regression model was built to investigate the most important risk factors.

Results: The mean age of cases was 48.5 ± 7.1 years. Age at marriage, number of pregnancy, age at menopause, oral contraceptive pills, breast feeding and family history of breast cancer in first-degree relative were identified as the most important correlates among the studied cohort.

Conclusions: The findings of the current work suggested that age at marriage, age at menopause $\geqslant 50$ years and 1st degree family history of breast cancer were risk factors for breast cancer, while, age at menopause < 50 years, number of pregnancies and practicing breast feeding were protective factors against breast cancer. There was no effect of body mass index or physical inactivity. Further

Abbreviations: BC, breast cancer; ACS, American Cancer Society; ASR, age specific ratio; NCCN, national comprehensive cancer network; HRT, hormone replacement therapy; NCI, National Cancer Institute; BMI, body mass index

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studies are needed to explore the hereditary, familial and genetic background risk factors in Saudi population.

Background

Breast cancer (BC) is considered as the most common female cancer comprising almost one third of all malignancies afflicting females. It is ranked as the second cause of death after lung cancer in women, worldwide [1,2]. The lifetime risk of developing invasive BC was 12.6% in 2013 in the USA [3]. American Cancer Society (ACS) estimated that 64,640 cases of carcinoma in situ of the breast and 234,580 invasive breast cancer will be diagnosed in the USA in 2013 [4].

According to the last Saudi Cancer Registration report in April 2014, BC was ranked the first among all female cancers, accounting for 27.4% of all newly diagnosed female cancers (1473/5378 cases) in 2010 [5]. The age specific rate (ASR) was 24.9/100,000 for Saudi female population while in the USA, it was 118.7/100,000 and in the UK, ASR was 129.4/100,000. Incidence increased with age, and the probability of developing BC was one in 69 in the 40s, one in 38 in the 50s, and one in 27 in the 60s, in the USA [6]. Likewise, in the KSA, incidence was correlated with age, whereby probability was one in 2000 in the 40s, one in 1400 in the 50s, and one in 1100 in the 60s [5].

WHO reported that, early detection was the cornerstone for BC control and it could improve breast cancer outcome and survival. Early detection and development of more effective treatments have led to significant declines in BC deaths and improved the outlook for women living with the disease [7,8]. The components of breast screening are dependent on the risk assessment, physical examination and screening mammogram. Therefore, if a woman has an abnormal mammographic finding on screening or a concerning finding on physical examination, additional breast imaging, ultrasonography, or even MRI and biopsy may be needed [6,9].

Several risk factors affecting the incidence of BC were reported by the national comprehensive cancer network (NCCN) as part of the clinical practice guideline in oncology, in addition to, numerous clinical trials and epidemiological studies carried out both in developed and developing countries, over the last three decades [9–17].

Risk factors can be classified into four main groups: *first*, family history/genetic background, which accounts for approximately 15% of all BC causes [17]. *The second* and most well-known risk factor for BC is hazardous effects of hormonal exposures such as early age at menarche, late age at menopause, fewer number of children or nulliparity, late age at first birth, little or no breastfeeding and long-term use of hormone replacement therapy (HRT) [11,16]. *The third* category is the high breast density, which has been recognized as one of the most significant markers of BC risk [15]. *Last but not least*, history of benign proliferative breast disease [10].

In spite of the fact that having a single risk factor or even several factors does not mean that the females will get the disease, many women with BC have no apparent risk factors (other than being a woman and growing old). Even in-patients with BC who have evident risk factors, it is difficult to trace the exact mechanism by which those risk factors have contributed to the disease development. Some factors influenced risk more than others and the BC risk can change over time, due to factors such as aging or lifestyle [9]. Although, there is no definite way to prevent the disease, wide range of preventive approaches have been outlined that might lead to risk reduction and help to increase the odds of early detection and survival i.e. periodic self-examination and mammography [12]. Certain socio-demographic factors may modulate the pattern of BC among Saudi women i.e. they tend to get married early, according to the traditional conservative values of the society, with childbearing period extending practically over their entire reproductive age. Due to the conservative nature of the society, many females would have refrained from seeking medical advice out of shyness until their disease became far advanced. Often they fear the treatment more than the disease itself [18].

Several models were developed to assess the interactive effect of multiple risk factors on overall patient risk. The most widely applicable model for general risk assessment is the Gail model, which assessed a variety of potential risk factors. A computerized version of the modified Gail model is available on the World Wide Web and has been widely distributed by the National Cancer Institute (NCI) [19].

The current work aimed to explore the most important BC correlates among females participating in the breast-screening program in Riyadh, KSA. These factors included; socioeconomic status (SES), body mass index (BMI), menstrual and reproductive factors, family history of breast and ovarian cancer.

Subjects and methods

Based on phase I data of the National Breast Cancer Screening program (NBCS), a case–control study was conducted on women living in Riyadh, KSA in the period from September 2013 to August 2014. The sample consisted of 348 women (58 cases and 290 controls). The 58 cases were the total newly diagnosed BC cases in Riyadh region during our study period (1 year), whereas phase-I NBCS is still running. The number screened during our study period was 5639 women. Cases were female patients diagnosed during screening via mammogram and their diagnosis was confirmed by clinical and pathological examination in the King Fahd Medical City Hospital in Riyadh. For each case, five age-comparable controls were selected from the same mobile clinics with normal screening mammogram.

A pre-coded designed questionnaire was used for data collection by well-trained female interviewers. Prior to interview, full explanation of the research objective, methods and expected benefits and hazards was introduced.