Lifestyle related risk factors for breast cancer in Jordanian females

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ABSTRACT

Objective: To compare the lifestyle related risk factors for breast cancer such as physical activity, cigarette smoking, the use of contraceptive pills and increased body weight between non-familial and familial breast cancer females in Jordan.

Methods: This study was carried out in the Kingdom of Jordan during the period 2000 through to 2002. A questionnaire was used to collect information from 99 females who were histologically and pathologically diagnosed for breast cancer. Data of the questionnaire was entered and analyzed using statistical package for social sciences.

Results: This study showed no significant difference between familial, non-familial breast cancer females and controls in the following risk factors: physical activity, contraceptive methods, and smoking. On the other hand, a statistically significant difference in weight was found between the familial breast cancer females, the total breast cancer females and the controls. In addition, the highest percentage of overweight and obese was found among postmenopausal breast cancer females.

Conclusion: Postmenopausal obesity is a significant risk factor among Jordanian breast cancer females.

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Breast cancer is a highly feared disease. Its incidence may reach up to one woman in 9 western populations. In developing population, it lower in occurrence, but it is rising in incidence.[1] Many possible risk factors for breast cancer have accredited scientific support. There is clear scientific evidence relating several risk factors with breast cancer. These factors are called established risk factors for breast cancer;[2] some are inherited predisposition, while other are aspects of lifestyle or reproductive history. The established risk factors for breast cancer include early menarche,[3] late menopause,[4] age at the first full time pregnancy,[5] low physical activity[6] and postmenopausal obesity.[7-9] Other risk factors have little or no scientific support include not breast feeding after pregnancy,[10-12] use of postmenopausal estrogen replacement therapy,[13] use of oral contraceptives,[14-15] alcohol consumption,[13,16] cigarette smoking[17-19] and certain specific dietary intake patterns such as low fruits and vegetables consumption,[20-21] the high fat consumption,[19,22] the high consumption of red meat[23-24] and the consumption of certain micronutrients such as vitamin C, folate and individual carotenoids.[25-26] The aim of this study is to compare and explore the relationship of physical activity, contraceptive, smoking, alcohol consumption and obesity as risk factors among familial and non-familial breast cancer females.

Methods. To determine the risk factors among Jordanian breast cancer female in 99 breast cancer females, and 99 normal females (as a control) were interviewed. The control participants were selected to matches. The cases based on age and place of

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residence. A signed permission was carried out for every female enrolled in this study, and a questionnaire was carried out in Al-Basheer hospital, Amman, Jordan between 2000 and 2002 for all breast cancer females who were histologically and pathologically diagnosed for breast cancer. The questionnaire includes information regarding age, physical activity, and the use of contraceptive pills, smoking, alcohol consumption and weight. Breast cancer females were then classified into either familial or non-familial. Criteria for classification familial breast cancer were based on at least one first or second-degree relative (from any of both parent sides) of the same lineage was affected with invasive cancer at any age as well as genetic testing for BRCA1 and BRCA2 genes. Forty two females out of 99 were breast cancer females who had a family history of breast cancer. The other 57 breast cancer females were breast cancers with no family history of breast cancer. Participants enrolled in this study were asked details regarding their lifestyle-oriented physical activity (meter they walked, stair they climbed or if they joined any physical activity club). Females considered positive for physical activity if they have moderate (at least one hour per day) to vigorous physical activity on regular basis for at least 6-months prior to the date of diagnosis. Smoking status was assessed using standard National Cancer Institute definition[27] positive smoking history defined as having smoked at least 100 cigarettes in one's lifetime. Previous smokers are those former smokers who report that they have not smoked for at least 6-months. Alcohol consumption was assessed by how many times per week they had drunk alcohol during the last 3-months. Females were asked regarding their weight. Participants were classified into 4 groups: underweight, normal, overweight and obese, using the percentiles of weight by age for males and females of one to 74-years.[28] Subjects considered as underweight if there weight lies below the 5th percentile, normal if the weight lies between 25th and 75th percentile, overweight if there weight lies between more than 75th and less than 95th percentile and obese if there weight is above or equal 95th percentile.

Statistical analysis was carried out using the statistical package for social sciences (SPSS 9.0.0; SPSS Inc, Chicago, Illinois, United States of America, 1998). Means and standard deviations (SD) along with percentages were calculated. The independent sample t-test and chi-square were performed to analyze differences between the 2 groups. Statistical significance was set at $P<0.05$.

Results. Comparison of risk factors among familial and non-familial breast cancer females and control were summarized in **Tables 1 & 2**. High percentage of non-familial (86%), familial (71.4%) breast cancer females and (81.8%) of controls reported that there was no physical activity on regular basis for at least 6-months prior to the date of diagnosis (**Table 1**). Fifty-six percent of breast cancer females had no contraceptive at all family planning practices, approximately 20% used contraceptive pills, 15% used intrauterine device and 9 used contraceptive pills and intrauterine device at the same time (**Table 1**). High percentage of non-familial (83%) and familial (81%) were non-smoker. The percentage of breast cancer females who were previous smokers was 10% compared to 8% who were smoker (**Table 1**). None of the participants were alcohol drinkers, because alcohol consumption is unacceptable religiously and socially. The percentages of underweight, overweight and obese patients were 4.3, 24.5, and 17. On contrast the percentages of underweight, overweight and obese of controls were 2.9, 23, and 11.4.

Statistically, there is a significant difference between familial breast cancer females and the control and between total breast cancer females and control at <0.05 level, but there is no significant difference between non-familial breast cancer females and control (**Table 2**). The distribution of the breast cancer females'weight according to the postmenopausal age showed that the percentage of overweight in postmenopausal age was 28.6% whereas it was 20% in premenopausal age, moreover, the percentage of obesity in postmenopausal and premenopausal ages were 20.4% and 13.3%.

Discussion. Rates of breast cancer vary 5-fold among countries, and this variation is highly influenced by lifestyle practices such as reduced physical activity.[29] Evidence is accumulating that high levels of physical activity are associated with a reduced risk of some cancers. The evidence is most consistent for colon cancer, which is reduced by 40-50% among the most active individuals.[30] Physical activity has a significant role in preventing breast and colon cancer, excess body weight and low physical inactivity accounts for approximately a quarter to one third of cancers of breast, colon, endometrium, kidney and esophagus.[31] Exercise during reproductive life has been shown to influence ovarian physiology and the concentration of ovarian estrogen and progesterone during the life cycle. These hormones play a crucial part in the development of breasts in women.[32] At the same time exercise decreases the number of ovulatory menstrual cycles, which may provide an opportunity for the primary prevention of breast cancer.[33] Physical activity and weight control exert a protective effect against breast carcinoma through a metabolic pathway; they lower insulin, glucose and

Table 1 - Comparison of physical activity, contraceptive methods, and smoking among non-familial and familial breast cancer females and controls.

Risk factors	Cancer origin Non-familial		Familial		Total		Controls	
Physical activity								
No-physical activity	49	(86)	30	(71.4)	**79**	**(79.8)**	81	(81.8)
Physical activity	8	(14)	12	(28.6)	**20**	**(20.2)**	18	(18.2)
Contraceptive								
No contraceptive	32	(56.1)	23	(54.8)	**55**	**(55.6)**	62	(62.6)
Contraceptive pills	14	(24.6)	6	(14.3)	**20**	**(20.2)**	18	(18.2)
Intrauterine device	8	(14)	7	(16.7)	**15**	**(15.2)**	19	(19.1)
Intrauterine device and pills	3	(5.3)	6	(14.3)	**9**	**(9.1)**	0	
Smoking								
Non-smokers	47	(82.5)	34	(81)	**81**	**(81.8)**	71	(71.7)
Smokers	3	(5.3)	5	(11.9)	**8**	**(8.1)**	19	(19.2)
Previous smokers	7	(12.3)	3	(7.1)	**10**	**(10.1)**	9	(9)

Table 2 - Statistics of weight among familial and non-familial breast cancer females.

Type of cancer	Mean ± SD	Significant (2-tailed)
Total breast cancer females	72.8 ± 13.16	0.035
Control	68.2 ± 12.59	
Non-familial	70.19 ± 12.49	0.556
Control	68.61 ± 13.81	
Familial	76.4 ± 13.51	0.020
Control	67.84 ± 11.51	

triglycerides levels and increase high-density lipoprotein cholesterol levels.[34] This study showed an expected finding; the higher frequency of familial and non-familial breast cancer was among physically inactive females. Controversy results persist in the association between oral contraceptive use and breast cancer. Studies showed no increased risk or protective role against ovarian and endometrial cancer.[35] Others showed significantly elevated risk among oral contraceptive users.[36] Alternatively some studies showed that oral contraceptive and hormone replacement therapy do not increase risk for breast cancer, but instead it decreases the incidence of benign breast cancer diseases.[37] This study showed no increased risk or protective role of contraceptive on breast cancer (**Table 1**); approximately half of the females enrolled in this study did not use contraceptive by any means (non-familial 56%, familial 55% and total females 56%). At the same time using combination of intrauterine device and pills are safer than using one method (**Table 1**). This study is inconsistent with previous studies in Jordan[15] which found that increased risk of breast cancer from oral contraceptives and fertility drugs, and it may due to the type and dose of the contraceptives used. The contribution of smoking in breast cancer is somewhat inconclusive. Some studies indicated reduced risk of breast cancer among smokers,[38] which may due to its effect as an anti-estrogenic mechanism. Other has associated tobacco exposure to increased risk of breast cancer.[39] Some studies failed to establish any relationship between breast cancer and smoking,[40] Former smoker have the highest risk.[41] In this study, the risk of breast cancer is higher among non-smoker in both non-familial (83%) and familial (81%) breast cancers. Smoker (overall breast cancer females 8%) and previous smoker (overall breast cancer females (10%) showed lower percentages (**Table 1**). This result is consistent with the previous study in Jordan[19] that smokers did not show any increased risk of breast cancer compared to control. Alcohol consumption has been shown to be associated with breast cancer risk, even in low range doses.[42] In Jordan, drinking alcohol is unacceptable religiously and socially for both sexes, consequently, Jordanian community represents a good environment for the studying of breast cancer risk factors away from alcohol consumption. None of the females involved in this study were alcohol drinkers. The predominant cancers associated with obesity have a hormonal base and include breast, prostate, endometrium, colon, and gallbladder cancers. Previous studies showed that avoiding overweight and obesity, reducing the risks of breast cancer and other cancers of colon, endometrium, kidney and esophagus.[1,31] Recent investigations showed that even birth weight and utero exposure to estrogen could predict breast

cancer risk in adulthood.[43,44] Girls with increased body mass were more likely to experience early menarche and thus were exposed to reproductive hormones for longer period of time. The conversion of androstenedione secreted by the adrenal gland into estrone by aromatase in adipose tissue stroma provides an important source of estrogen for the postmenopausal woman. This estrogen may play an important role in the development of endometrial and breast cancer.[9] The results of this study was consistent with the previous studies[7,8] which showed that postmenopausal obesity is a risk factor for breast cancer. The major limitation of this study is that the sample size was small which precludes generalization of the results, but this study indicates a broader view of risk factors correlated with breast cancer in Jordan than was previously addressed.

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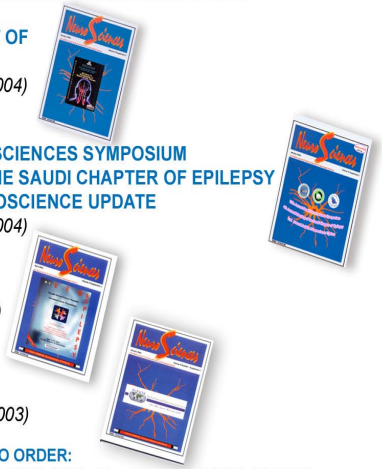

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