Analyzing Predisposing Risk Factors for Breast Cancer among Iraqi Women in Baghdad Teaching Hospital and National Center for Cancer Diseases in Baghdad in 2018.

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Abstract

Background

Breast cancer is the most frequent malignancy in women worldwide. In Iraq, Breast cancer ranks the first among cancers diagnosed in women, the goal of this study is to bring the lights towards the importance of most common risk factors for breast cancer to reduce the incidence of breast cancer.

Methods

A case control study involved breast cancer women who attended national center for cancer diseases hospital in Baghdad between first of June 2018, and first of September 2018, the cases were (60) and control were (90) all of them were interviewed using questionnaire that contains risk factors for breast cancer and all cases had their medical records available. SPSS version 23 was used. Each parameter is compared separately for statistically significant differences.

Results

This study shows that the mean age of cases is 48.30 and the mean of controls is 34.42.
The Body mass index, the martial status, radiation exposure and smoking of both cases and control were not statistically significant, the gravity, abortion and breast feeding also show no significant differences.
The family history is highly significant between cases and controls, 24 cases shows from 60 had family member with the disease and most of them had sisters as the affected family member.
Contraceptive intake also showed significant differences, there is 35 cases from 60 use contraceptive drug.

Conclusion

The majority of women with breast cancer had been in the 5th decade,
Family history and contraceptive pills intake are strong predictors for Breast cancer.

Keywords: Breast cancer, Iraqi women, BMI, family member, contraceptive.

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1.Introduction

Breast cancer (BC) is the most prevalent cancer among women worldwide, accounting for about 25% of all malignancies. [1] It is also the leading cause of female cancer-related mortalities. Although substantial improvement in survival from this disease had been reported in high-resource countries, the risk continues to increase, yielding high death rates in middle and low income countries. [2] [3] Within the Eastern Mediterranean Region (EMR), cancer is the fourth-ranked cause of death, after cardiovascular diseases, infectious diseases and injuries. [4] According to World health organization (WHO), it was found that the incidence of the disease in the developing countries is increasing and this may be due to increase urbanization, increase life expectancy and adopting western lifestyles. [5] Being a woman is the biggest risk factor for the development of the disease. There are about 266,120 new cases of invasive breast cancer and 63,960 cases of non-invasive breast cancer in this year in American women. While men do develop breast cancer, less than 1% of all new breast cancer cases happen in men. Approximately 2,550 cases of breast cancer will be diagnosed in American men this year. The biggest reasons for the difference in breast cancer rates between men and women are: Women's breast development takes 3 to 4 years and is usually complete by age 14. [6]

1.1. Risk Factor

Each woman's breast cancer risk can be high or low, depending upon many Factors, including family history, genetics, age of menstruation, and other factors that have not yet been identified. [5, 6] While breast cancer is less common at a younger age groups (i.e., in their thirties), younger females tend to have more aggressive breast cancers than older women, which may explain why survival rates are lower among younger women. [7] Regarding age, the risk of breast cancer goes up as the individual gets older. For example, according to the American Cancer Society, about 1 out of 8 invasive breast cancers develop in women younger than 45. About 2 out of 3 invasive breast cancers are found in women 55 years or older. [8] Family history is one of most predisposing risk factors affecting BC, Women with close relatives who've been diagnosed with breast cancer have a higher risk of developing the disease. [9] Regarding menstrual cycle; Women who started menstruating (having periods) younger than age 12 have a higher risk of breast cancer later in life. The same is true for women who go through menopause when they're older than 55. Over the past 15 years,

girls have been starting puberty at younger ages. Breast development has started even earlier than menstrual periods. This unexpected shift has been attributed to the obesity epidemic and broad exposure to hormone disruptors, since a rise in hormones triggers the onset of breast development and puberty. (10)

1.2. Pathology

Breast cancer may arise from the epithelium of the duct system anywhere from the nipple end of major lactiferous ducts to the terminal duct unit, which is in breast lobule. The disease may be entirely in situ, an increasingly common finding with the advent of breast cancer screening or may be invasive cancer. The degree of differentiation of the tumor is usually described using three grades as: well differentiation, moderately differentiation. Poorly differentiation. (11)

Lobular carcinoma in situ (LCIS) is a predisposing risk factor for developing cancer in either breast (7% at 10 years).Commonly numerical grading system based on the scoring of the three individual factors (nuclear pleomorphism, tubular formation, and mitotic rate) is used in grade 3 cancers roughly equating the poorly differentiated group. (12)

2.Methods

2.1. Study design and setting:

This is a case-control study that took place in Baghdad teaching hospital and the National Center of Cancer in 2018.

2.2. Population and sample:

Patients with a definitive diagnosis of breast cancer who visits the National Center of Cancer for receiving the treatment were included in the study. The period of the study was from the first of the June to the first of September in 2018. No criteria were applied by the researchers for inclusion of Breast cancer cases in this study. Controls were patients who don't have a history of Breast cancers or other cancer types. Controls were taken from gynecology and obstetrics ward in Baghdad teaching hospital.

2.3. Data collection:

A self-structured questionnaire was organized for the purpose for this study, the same questionnaire was used for the cases and the controls.

The questionnaire was divided into 4 parts;

- Demographic information
- Information about Menstrual cycle
- Information about family and personal History
- Past Surgical History

Data were collected by the researchers by interviewing the patients during their presence in hospital. The sample was collected from two hospitals (Baghdad teaching hospital and the National Center of Cancer). Data collection for cases was for 2 days in each week (Monday and Tuesday) in order to manage to collect all Breast cancer case.

2.4. Ethical consideration:

- This study is a type of epidemiologic studies which is based mostly on the answer of person taken in the sample. It includes clinical data collection and questionnaire fulfillment.
- Informed consent was taken from patients who participated in the study, they received a detailed explanation of the purpose and methods of the study. Also, Full privacy of patient's information was kept in this study and patients' identity and their profile is protected.
- Ethical approved was taken from Baghdad teaching hospital and university of Baghdad –collage of medicine.

2.5. Statistical analysis:

For statistical analysis, Statistical package for social science (SPSS) version 23 was used. Each parameter is compared separately for statistically significant differences between Breast cancer (BC) cases and Non-BC controls. Chi square test and t-test were used to test statistical significance between categorical variable (age group, educational level, occupation, marital status, BMI, Menarche, Menstrual cycle, First pregnant, Abortion, family history, Smoking, Radiation, Contraceptive Therapy). p-value less than 0.05 is considered significant.

3.Results

3.1. Descriptive and Statistical analysis:

A total number of 150 (N=150) were collected, N=90 of them were cancer free patients and were selected as controls for this study and N=60 of them were breast cancer patients. Age mean in cases and controls showed that cases (age= 48.30 year) and control (age = 34.42 year). Table 1 will show the age groups. Age groups showed significant different (p-value=0.001) between cases and controls using Chi square test. Occupation shows no significant difference (Pearson chi square p-), table 2 represents the occupation proportions. The results of educational level shown in table 3, it shows significant difference between the two groups using Chi-square test (p-value=0.008) between case

and control. Body mass index (BMI) variable shows no significant differences between cases and controls and the p-value of t-test is 0.343. Its mean of control was (27.07) and of cases was (28.1). Figure 1 represent the distribution of the BMI among the cases and control. The marital status shows non-significant differences between control and cases (chi square p-value =0.444) as shown in table 4. The menarche shows significant difference between cases and controls (p-value of t test is 0.003), figure 2 shows the distribution of menarche between cases and control. The variable of menstrual cycle shows statistically significant difference between the two groups. The regularity of menstrual cycle shows significant p-value using chi square of a value of (0.0004). Table 5 shows the distribution of this variable. Gravidity shows no significant differences (p-value regarding t test=0.062). Figure 3 shows the distribution of this variable.

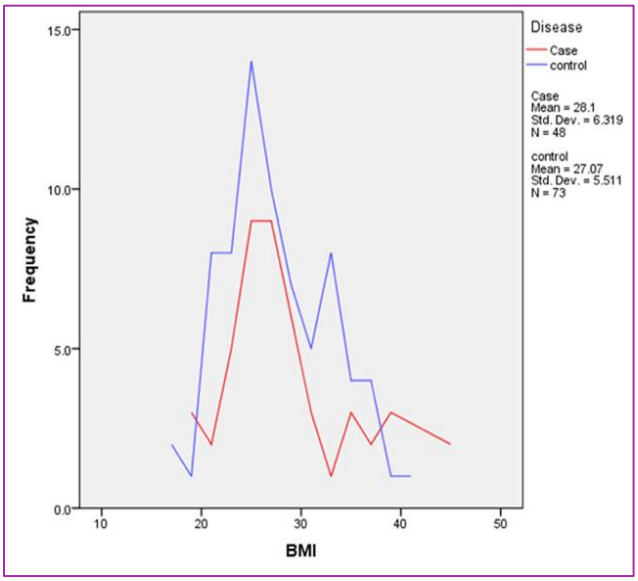

Figure 1: Line chart shows BMI of case and control.

Abortion shows no significant differences between cases and controls and the p-value regarding t-test is 0.784. Table 6 shows the distribution of this variable.

Regarding Breast Feeding, there was no significant association between the two groups (p-value using chi square 0.543). Table 7 shows the distribution of breast feeding between the two groups.

Table 2 : Represents the occupation proportions

			Occupation				Total
			Educational field	Employee	Housewife	Student	
Disease	Case	Count	8	8	43	1	60
		% within Disease	13.3%	13.3%	71.7%	1.7%	100%
	Control	Count	7	8	63	12	90
		% within Disease	7.8%	8.9%	70%	13.3%	100%
Total		Count	15	16	106	13	150
		% within Disease	10%	10.7%	70.7%	8.7%	100%

Table 4 : Disease and marital state.

			Marital state			Total
			Married	Single	Divorced	
Disease	Case	Count	51	8	1	60
		% within Disease	85.0%	13.3%	1.7%	100.0%
	Control	Count	76	14	0	90
		% within Disease	84.4%	15.6%	0.0%	100.0%
Total		Count	127	22	1	150
		% within Disease	84.7%	14.7%	0.7%	100.0%

Table 7 : below shows the distribution of breast feeding between the two groups.

			Breastfeeding		Total
			Yes	No	
Disease	Case	Count	33	27	60
		% within Disease	55.0%	45.0%	100.0%
	Control	Count	54	36	90
		% within Disease	60.0%	40.0%	100.0%
Total		Count	87	63	150
		% within Disease	58.0%	42.0%	100.0%

The family history shows a significant difference between the two groups with a p-value of 0.001. Figure 4 shows the distribution of this variable.

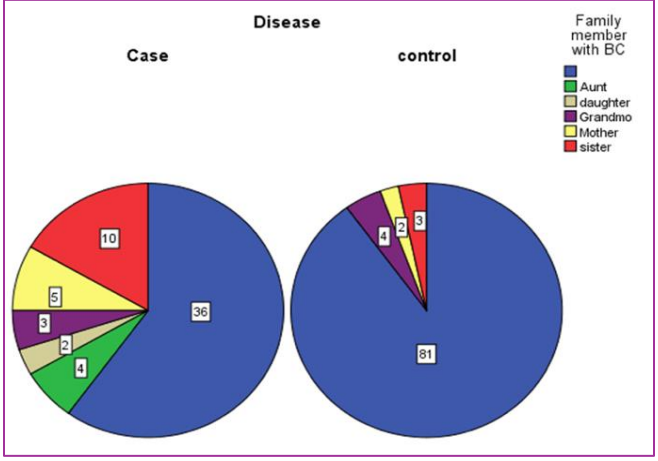

Figure 4: Pie chart of Family member who have Breast cancer.

The smoking shows no significant differences between cases and controls (The p-value of chi square=0.174). Table 8 shows the distribution of this variable. There is significant difference between cases and controls regarding Contraceptive drug intake (the p-value of chi square=0.013). Table 9 below shows the distribution of this variable. Radiation and Exercise showed no significant difference using chi square (p-value to radiation=0.136 and p-value to exercise=0.576). Table 10 shows the distribution of this variable.

Table 9 : Show disease and Contraceptive drug intake

			Contraceptive drug		Total
			Yes	No	
Disease	Case	Count	35	25	60
		% within Disease	58.3%	41.7%	100.0%
	Control	Count	34	56	90
		% within Disease	37.8%	62.2%	100.0%
Total		Count	69	81	150
		% within Disease	46.0%	54.0%	100.0%

3.2. Odd Ratio

Hence, this is a case-control study, odd ratio was calculated for the binary variable that shows a significant difference between cases and controls. These include: Contraceptive pills (odd ratio=2.306) Family history (odd ratio=6.833).

4. Discussion

Before interpreting the results of our study, it is important firstly to describe its limitations. While our response rates were reasonably high, 83% for cases and 71% for controls, selection bias remains a potential concern. Bias could result if the women who refused to participate were different from those who did participate with respect to their histories of menopausal symptoms. However, the comparisons across cases group are unlikely to be affected by such differences, given that it is unlikely that the proportions of menopausal symptoms among the cases not interviewed would differ considerably by case type. Some data were considered missing as there were incomplete records information or patients' inability to answer personal questions. All exposure data were based on self-report, so recall bias is another concern.

4.1. Demographic data:

Educational level shows significant difference in distribution between cases and controls. Women who are educated may have better information about breast cancer and this relates to breast self-examination (BSE), when the educational level of women is high, the early diagnosis of cancer might be done by BSE but in our study, we found the opposite in that not all highly educated women have a good information about Breast cancer. [13] [14] Significant differences between cases and controls in the mean age can be an important factor affecting breast cancer. This study showed the highest numbers of breast cancer patients are in the age group of 41-70 years, while National Cancer Institute showed that breast cancer is more common

with more advance age. [15] While In American women, the risk increased from 1:5900 to 1:290 between the third and eighth decades and a woman aged 60-79 years has a 1:14 chance to develop invasive breast cancer, compared with a woman younger than 39 years, who has a 1:225 probability. [16] The mean BMI shows no significant differences between cases and controls but the menopause women had large BMI compared to premenopausal women. Current BMI is strongly associated with fatal postmenopausal breast cancer. [17] 85% of cases were married, and the odd ratio was 1.1, this mean married women has the same chance to be affected by BC compared to single women. Another study other showed that, women who had at least one full-term pregnancy had 25% reduction in their breast cancer risk. [18] [19]

4.2. Menstrual data:

The mean age of women with Breast cancer (BC) of the menarche was more than the mean age of women without BC and this shows some differences to multiple studies that suggests that women with early age of menarche tend to show more evidence to have BC than the other women whose menarche is late, the effect of early menarche might be due to hormonal effect , because they increase breast cells proliferation but in our study this difference may be due to low number of case and control . [20] And this may be due to that almost all women with BC in our study were elderly so they may forgot when the age of menarche was and they may gave the researchers a wrong answer. The regularity of menstrual data showed significant differences between cases and controls in that when women become menopause, they have a higher risk of being affected by breast cancer, the results of our study is opposite to other studies that indicates women who have ever experienced menopausal symptoms had lower risks of carcinoma. [21] [22] 55% of cases and 60% of controls did breast feeding and that shows no significant differences regarding p-value. The longer women breast feed, the more they are protected against breast cancer. The lack of or short lifetime duration of breastfeeding which is typical of women in developed countries makes a major contribution to the high incidence of breast cancer in these countries. [23] The mean number of pregnancies in cases is 3.07 and of controls is 4.06, there is no significant differences in the mean. There is evidence that the more children a woman has, the greater the protection from breast cancer and women with five or more children had 50% of the risk of the nulliparous women. The results

of our study shows that the number of children shows no difference. [24] Abortion percentages of our study showed no significant differences between cases and controls, and this mean that the abortion did not affect women chance to get BC. This was opposed to the finding of another study that explained the abrupt hormonal changes that are associated with termination of pregnancy may induce changes in breast epithelial cells at a stage when they are not fully differentiated and therefore more vulnerable to later development of breast cancer. This may be due to that women did not understand what we meant by abortion or a more sample size is required. [25] There is significant difference between cases and controls in relation to the age of First pregnancy, our study showed that controls have a mean age of first pregnancy of 19.9 years and the cases have a mean of 22 years, this mean that women with early first time pregnancy has a chance to reduce her long-term risk of breast cancer. This is due to hormones released during pregnancy that generate genetic changes in the mammary glands that allow mature breast cells to protect against breast cancer. [26] Majority of cases in this study were without family history of breast cancer (60% from all cases) and only 20% had first degree of family from all data, but the odd ratio suggests that if women had family history of cancer, it has chance of 6 times more to develop breast cancer than those who did not have; other study showed that the relative risk of patients with an affected first-degree relative is 1.5-2 times higher when compared to controls without affected family members. [27] Other studies also showed that having two first-degree relatives affected (female or male) increases relative risk by more than 4-6 times when compared to patients without this risk factor). [28]

4.3. Personal Data:

Contraceptive pills use shows significant difference between the two groups. The odds ratio of our study is (2.2) this mean women who used contraceptives had a 2-fold increment of being affected by BC and this is just like many other studies. [29] Smoking shows no significant difference in our study, this is because the percentage of smoker females in our society is less than the other communities, and due to the fact that BC mostly occurs in females, the smoking variable was not statistically significant. Smoking causes a number of diseases and is linked to a higher risk of breast cancer in younger, premenopausal women. And a research also had shown that there may be link between very heavy second-hand smoke exposure and breast cancer risk in

postmenopausal women. [30] In comparison to other studies, smoking shows that there is significant difference because most of the studies done in different cultures especially in united states.

Conclusion

- Older women have a greater risk to have breast cancer.
- Women who take Contraceptive pills should be aware of the fact that they are predisposed to have breast cancer.
- Females with a family history of breast cancer are at risk of having breast cancer more than the women with clear family breast cancer history and they should do regular checks for themselves

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Appendix

- **Tables**

Table 1: show the frequency of age group.		
	Age	Frequency
Valid	<= 20	14
	21 -30	34
	31 -40	31
	41 -50	35
	51 -60	23
	61 -70	13
	Total	150

Table 3: show the cross tabulation between educational level and disease of women.

			Education					
			Uneducated	Primary	Secondary	High	Collage	Postgraduate
Disease	Case	Count	10	11	15	2	10	12
		% within Disease	16.7%	18.3%	25.0%	3.3%	16.7%	20.0%
	Control	Count	15	32	17	7	16	3
		% within Disease	16.7%	35.6%	18.9%	7.8%	17.8%	3.3%
Total		Count	25	43	32	9	26	15
		% within Disease	16.7%	28.7%	21.3%	6.0%	17.3%	10.0%

Table 5: Showing the Menstrual cycle and disease cross tabulation regarding participation.

			Menstrual cycle			Total
			Regular	Irregular	Menopause	
Disease	Case	Count	22	11	27	60
		% within Disease	36.7%	18.3%	45.0%	100.0%
	Control	Count	69	14	7	90
		% within Disease	76.7%	15.6%	7.8%	100.0%
Total		Count	91	25	34	150
		% within Disease	60.7%	16.7%	22.7%	100.0%

Table 6: Show Cross tabulation between abortion and disease.

		Abortion		Total
		Yes	No	
Disease	Case	22	38	60
	Control	35	55	90
Total		57	93	150

Table 8: Show smoke and disease cross tabulation regarding participation.

			Smoking		Total
			Yes	No	
Disease	Case	Count	4	56	60
		% within Disease	6.7%	93.3%	100.0%
	Control	Count	2	88	90
		% within Disease	2.2%	97.8%	100.0%
Total		Count	6	144	150
		% within Disease	4.0%	96.0%	100.0%

Table 10: Show radiation and exercise and disease table of cross tabulation.

		Disease	
		Case	Control
		Count	Count
Exercise	Yes	5	10
	No	55	80
Radiation	Yes	3	11
	No	57	79

- **Figures**

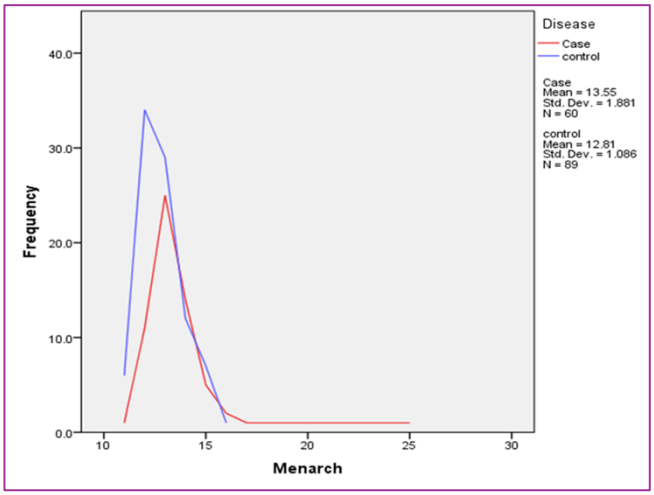

Figure 2: Line chart of Menarche regarding the disease.

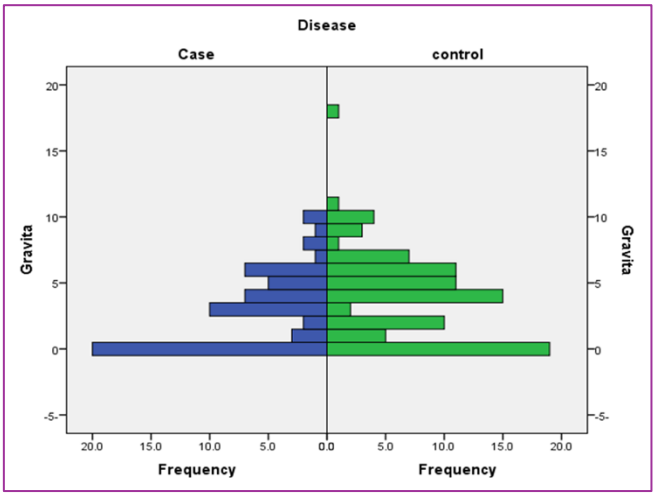

Figure 3: Histogram show frequency of gravitas in case and control.