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RISK FACTORS OF BREAST MASS AMONG FEMALE 40 YEARS AND ABOVE IN MOSUL CITY. CASE-CONTROL STUDY

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INTRODUCTION

More than a quarter of females complain of breast problems in their lives[1] and the majority of these ladies initially will present as a new breast lump in the primary health care setting.[2] Breast masses are the most prevalent breast complaint, with cancer being the main worry for most women. There are many different reasons for breast lumps to arise, ranging from highly aggressive cancer to physiological adenosis. Management is based on the underlying cause. It could range from simple analgesics to surgery. Several masses can go away on their own.[3, 4, 5] Breast cancer, galactoceles, fibroadenomas, fibrocystic change, and breast tissue infections are the causes of breast mass. About 10% of breast lumps are caused by breast cancer.[6] A breast mass, commonly called a breast lump, is a feeling of a small, distinct enlargement that is located within the breast. There could be associated skin changes, nipple discharge, or breast discomfort. The research was conducted at three specialized breast consulting units in Mosul city; Two of the specialized clinics were located on the right bank of Mosul (Al Jamhori and Mosul general hospital) and the third one was located on the left bank of Mosul (Al Khansa'a Hospital).

Epidemiology

Benign breast disease is frequently more prevalent. Most of these situations could initially show up as a new breast mass. Therefore, it is imperative that every physician feels confident in the assessment and management of these patients, and a comprehensive, consistent strategy will make this possible.[7] Between 25% and 50% of adult women suffer from benign breast illness, which accounts for 3% of practitioners' interactions with female patients in general.[8] Breast cancer is the world's most prevalent cause of cancer-related deaths, with a lifetime estimation risk of 12% according to the WHO.[9]

Risk Factors of Breast Mass

- Being overexposed to estrogens is the most related risk factor for breast cancer. Therefore, in every patient presenting with a new breast tumor, it is imperative to investigate estrogen exposure.
- Breastfeeding is a protective factor against estrogen exposure.
- Early onset menarche.
- Late onset of first pregnancy.
- Nulliparity.
- Hormone replacement therapy including oral contraceptive pills.
- Late onset of menopause can increase the exposure rate of estrogen.
- Other risk factors, like obesity and excessive alcohol consumption, raise endogenous estrogen levels.[10, 11, 12]

Aim of The Study

The study aims to assess the risk factors for breast mass among females 40 years and above in Mosul city.

Specific Objective

- To assess the important risk factors associated with the development of breast mass.
- To evaluate the socio-demographic characteristics among the studied sample.
- To determine the clinical presentation of the cases having breast mass

Patients and methods Study setting

The research had been conducted at all of the specialized breast consulting units in Nineveh governorate; Al Jamhori and Mosul general hospital and the third one was located at the left bank of Mosul (Al Khansa'a Hospital).

Study design

An observational, analytic, Case-control study was adopted to achieve the objectives of the present study.

Data was collected from the participants retrospectively by the non-randomized convenient technique.

Study Period
Data collection was done during six months period from the 1st of January 2024 to the 31st of June 2024.

Study sample
Three hundred-sixty participants: 180 will be cases and 180 will be controls.

Data collection tool
A questionnaire form was specially prepared in order to collect all the relevant information related to the study sample. the questionnaire contain detailed history of Age, gender, risk factors for HTN.

RESULTS
The study included 360 subjects, mean (±SD) age of 51 (±9.8) years, with all females. Subjects with breast mass (cases) were 180 (50%) and those without breast mass (controls) were 180 (50%) too.

Table 1 shows a comparison of age group and BMI categories between subjects with a breast mass and subjects with no breast mass. Risky association (odds ratio=2.317) and statistically significant difference (p-value ≤ 0.05) were found in the age group 50 years to less than 60. Otherwise, no risky or protective association and no statistically significant difference were found in the age group 60 years and above. There was no risky or protective association and no statistically significant difference found when comparing different BMI groups (normal weight, overweight, class 1 obesity, class 2 obesity, or class 3 obesity).

Table 1: Comparison of age group and BMI categories between subjects with breast mass and subjects with no breast mass (n=180).

Variable	Breast mass	No breast mass	Odds ratio (95% Confidence Interval)	P value
Age:				
-40 years to less than 50	75 (41.7%)	105 (58.3%)	1.000	Ref
-50 years to less than 60	66 (64.7%)	36 (35.3%)	2.317 (1.075-6.928)	**0.034**
-60 years and above	39 (50%)	39 (50%)	1.000 (0.556-1.544)	0.476
BMI:				
- 18.5 – 24.9 (normal)	33 (55.00%)	27 (45.00%)	1.000	Ref
- 25 – 29.9 (overweight)	63 (37.50%)	105 (62.50%)	0.428 (0.175-1.380)	0.177
- 30 – 34.9 (obesity class 1)	69 (69.70%)	30 (30.30%)	3.108 (0.595-5.955)	0.282
- 35 – 39.9 (obesity class 2)	14 (53.84%)	12 (44.40%)	1.180 (0.210-4.978)	0.978
- BMI ≥40 (obesity class 3)	1 (33.33%)	2 (66.67%)	0.497 (0.990-1.010)	0.999

Table 2 shows the comparison of age group and BMI categories between subjects with breast cancer and subjects with no breast cancer. No risky or protective association and no statistically significant difference were found in the age group 50 years to less than 60 years, or 60 years and above. Similarly, there was no risky or protective association and no statistically significant difference was found when comparing different BMI groups (normal weight, overweight, class 1 obesity, class 2 obesity, or class 3 obesity).

More over Table 3 shows the comparison of demographic and personal history between subjects with breast mass and those without breast mass. There was no risky or protective association and no statistically significant difference in blood group, marriage, or smoking history between the two groups. As shown in table 3.

Table 4 illustrates the family history of breast and other organ cancer comparison and both study groups, there were no risky or protective associations and no statistically significant difference in terms of family history of breast cancer, or other cancers between the study groups. As shown in table 4.

Table 5 shows the comparison of obstetric history as a risk factors for breast mass. Regarding the history of breastfeeding of the last child, the risky association was found (odds ratio=1.222) and there is a statistically significant difference between the study groups (p-value < 0.05) with (less prevalent in the breast mass group). Furthermore; risky association (odds ratio=2.628) and statistically significant differences (p-value < 0.05) were found between the study groups regarding the use of hormonal stimulation for ovulation (more prevalent in the breast mass group). There were no risky or protective associations and no significant difference in terms of age at first or last child, breastfeeding first child, number of children, as well as the use of birth control.

Table 2: Comparison of age group and BMI categories between subjects with breast cancer and subjects with no breast cancer (n=180).

Variable	Breast cancer (n=33)	No breast cancer (n=147)	Odds ratio (95% Confidence Interval)	P value
Age:				
-40 years to less than 50	9 (12.00%)	66 (88.00%)	1.000	Ref
-50 years to less than 60	15 (22.70%)	51 (77.30%)	1.568 (0.451-10.316)	0.336
-60 years and above	9 (23.10%)	30 (76.90%)	1.462 (0.376-12.868)	0.382
BMI:				
- 18.5 – 24.9 (normal)	6 (18.20%)	27 (81.80%)	1.000	Ref
- 25 – 29.9 (overweight)	9 (14.30%)	54 (85.70%)	0.645 (0.106-5.324)	0.774
- 30 – 34.9 (obesity class1)	17 (25.00%)	51 (73.90%)	2.316 (0.264-9.538)	0.613
- 35 – 39.9 (obesity class 2)	1 (6.25%)	15 (93.75%)	0.277 (0.990-1.010)	0.999
- BMI ≥40 (obesity class 3)	0 (0.00%)	0 (0.00%)	1.000	1.000

Table 3: Demographic and personal comparison between subjects with a breast mass and those with no breast mass (n=360).

Variable	Cases, *(n=180, 50%)*	Controls, *(n = 180, 50%)*	Odds ratio (95% Confidence Interval)	P value
Blood groups:				
- A, n (%)	45 (25%)	42 (23%)	1.095 (0.477-2.697)	0.932
- AB, n (%)	12 (7%)	6 (3%)	2.071 (0.364-12.320)	0.843
- B, n (%)	21 (12%)	24 (13%)	0.886 (0.303-2.832)	0.966
- O, n (%)	102 (57%)	108 (60%	0.871 (0.143-1.832)	0.889
Married, n (%)	174 (97%)	168 (93%)	2.071 (0.299-12.320)	0.402
Smoking history, n (%)	21 (12%)	9 (5%)	2.59 (0. 860-3.642)	0.186

Table 4: Family history of breast cancer and another cancer comparison between subjects with breast mass and those with no breast mass (n=360).

Variable	Cases, *(n=180, 50%)*	Controls, *(n = 180, 50%)*	Odds ratio (95% Confidence Interval)	P value
Family history of breast cancer, n (%)	63 (35%)	60 (33%)	1.093 (0.523-1.600)	0.847
Family history of other cancer with or without breast cancer, n (%)	69 (38%)	66 (37%)	1.043 (0.445-1.951)	0.850

Table 5: Comparison of obstetric history between subjects with a breast mass and those with no breast mass (n=360).

Variable	Cases, *(n=180, 50%)*	Controls, *(n = 180, 50%)*	Odds ratio (95% Confidence Interval)	P value
Breast feeding first child, n (%)	132 (73%)	144 (80%)	0.675 (0.388-1.252)	0.388
Breastfeeding last-child, n (%)	99 (55%)	135 (75%)	1.222 (1.064-3.680)	**0.022**
Birth control, n (%)	36 (20%)	51 (28%)	0.696 (0.616-3.875)	0.286
Hormonal stimulation for ovulation, n (%)	63 (35%)	30 (17%)	**2.628 (1.146-3.905)**	**0.022**

Table 6 shows a comparison of gynecological history as a risk factors for breast mass. Risky association (odds ratio=4.846) and statistically significant difference (p-value < 0.05) were found among the study groups concerning the previous breast issues. Moreover; risky association (odds ratio 5.731) and statistically significant difference (p value < 0.05) were found regarding menarche at younger age. Furthermore; risky association (odds ratio=3.930) and statistically significant difference (p-value < 0.05) were found among the study groups in regards to previous breast biopsy. Of note, a trend was found in the history of late menopause (57% in subjects with breast mass, compared to 40% in those without mass), p=0.068. Otherwise, there was no risky or protective association and no significant differences were found in terms of cycle regularities and hormonal use after menopause between the two groups. As shown in table 11.

Table 6: Comparison of gynecological history between subjects with a breast mass and those with no breast mass (n=360).				
Variable	**Cases, *(n=180, 50%)***	**Controls, *(n = 180, 50%)***	**Odds ratio (95% Confidence Interval)**	**P value**
Regular cycle, n (%)	129 (72%)	150 (83%)	0.526 (0.049-1.338)	0.126
Menarche at younger age, n (%)	98 (54%)	31 (17%)	**5.731 (1.222-9.238)**	**0.006**
Late menopause, n (%)	102 (57%)	72 (40%)	1.819 (0.949-4.055)	0.068
Hormonal use after menopause, n (%)	15 (8%)	9 (5%)	1.652 (1.039-4.695)	0.464
Issues with the breast, n (%)	63 (35%)	18 (10%)	**4.846 (1.063-1.942)**	**0.001**
Previous breast biopsy, n (%)	66 (37%)	24 (13%)	**3.930 (1.198-5.425)**	**0.003**

Out of 180 subjects with breast mass FNAC, 66 (37%) had breast mass FNAC done, with biopsies ranging from 1-2 in each individual, except three who had 4 biopsies, and another three who had 10 biopsies in total. Out of 66 subjects who had a biopsy, 33 had benign findings (lipoma in 9 (27.3%), fibroadenoma in 9 (27.3%), fat necrosis in 6 (18.2%), duct papilloma in 3 (18.2%), and normal in 6 (9%). On the other hand, biopsy confirming carcinoma was reported in 33 (50%). As shown in Figure 1 and Table 7.

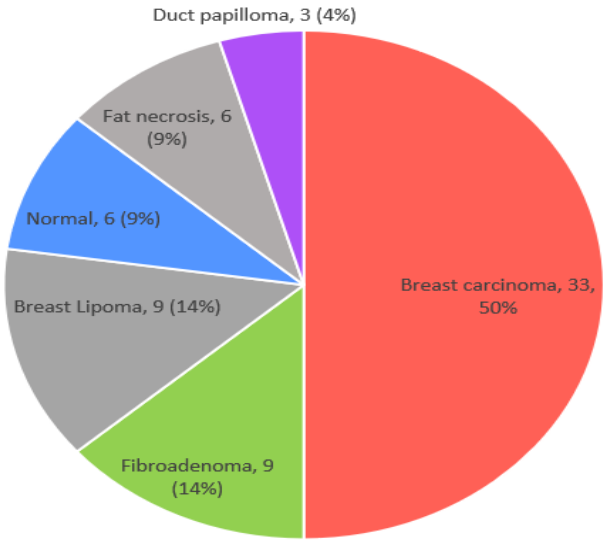

Figure 1: Histopathological findings of breast fine needle aspiration cytology.

Table 7: Types of mass diagnosed by fine needle aspiration cytology.		
Variable	No.	(%)
Carcinoma	33	50 %
Lipoma	9	13.64 %
Fibroadenoma	9	13.64 %
Fat necrosis	6	9.09 %
Duct papilloma	3	4.54 %
Normal	6	9.09 %
Total	66	100 %

All of these 33 patients with confirmed carcinoma underwent treatment for that, which included surgery in 9 out of 33 (27%), chemotherapy in 12 (36%), and hormonal therapy in another 12 (36%). Radiation therapy was given to 27 out of 33 (82%). As shown in Figure 2 and Table 8.

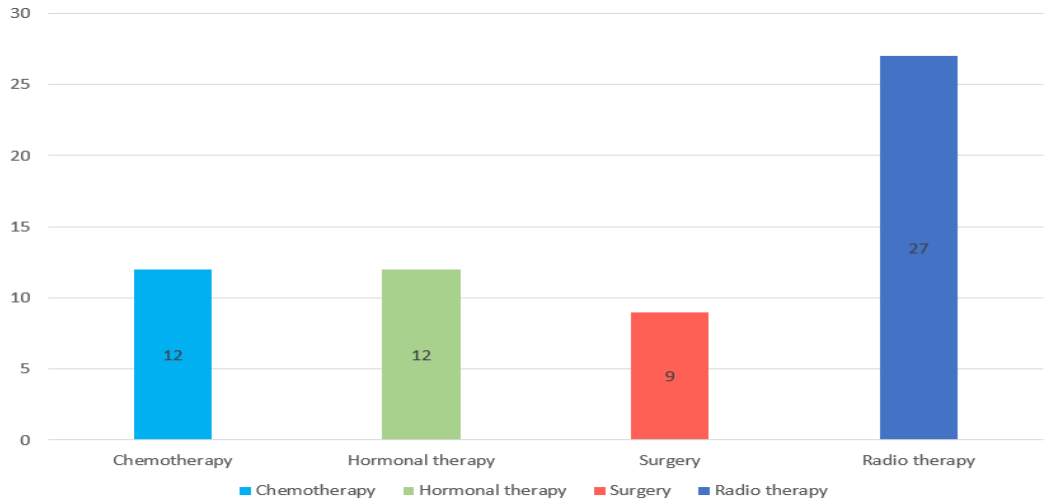

Figure 2: Type of therapy received by patients with breast cancer.

Table 8: Number and percent of treatment options received from the patients.		
Variable	**No.**	**(%)**
Surgery	**9**	**27**
Chemotherapy	**12**	**36**
Hormonal therapy	**12**	**36**
Radiation therapy	**27**	**82**

It Table 9 illustrates the comparison between cases with mass proven as carcinoma, versus those who had a mass but no carcinoma. No risky or protective association and no statistically significant differences were found between cases with carcinoma and those with no carcinoma in terms of mean ages, weight, height, BMI, Blood groups, being married, and smoking history. As shown in table 9.

Table 9: Comparison of demographic and personal parameters between subjects with breast cancer and those with breast mass but not cancer (n=180).

Variable	Breast cancer *(n=33, 18%)*	Breast mass but no cancer *(n = 147, 82%)*	Odds ratio (95% Confidence Interval)	P value
Blood groups:				
- A, n (%)	3 (9%)	42 (29%)	0.242 (0.023-1.133)	0.279
- AB, n (%)	0 (0%)	12 (8%)	0.463 (0.049-4.392)	0.314
- B, n (%)	3 (9%)	18 (12%)	0.725 (0.120-1.890)	0.689
- O, n (%)	27 (82%)	75 (51%)	4.376 (0.845-22.078)	0.079
Married, n (%)	3 (9%)	144 (98%)	0.001 (0.001-1.004)	0.336
Smoking history, n (%)	6 (18%)	24 (7%)	2.916 (0.850-3.407)	0.215

Table 10 shows a comparison between patients with proven breast carcinoma and those with no carcinoma. Risky association (odds ratio=7.310) and statistically significant difference (p-value ≤0.05) with regards to family history of breast cancer. No risky or protective association and no statistically significant differences were found among patients with breast cancer and no breast cancer groups in terms of family history of other-cancer.

Table 10: Comparison between subjects with breast cancer and those with breast mass but not cancer in regards to family history of breast or other cancers (n=180).

Variable	Breast cancer *(n=33, 18%)*	Breast mass but no cancer *(n = 147, 82%)*	Odds ratio (95% Confidence Interval)	P value
Family history of breast cancer, n (%)	24 (73%)	39 (27%)	7.310 (1.697-32.139)	0.004
Family history of other, n (%)	21 (64%)	48 (33%)	1.277 (0.871-2.086)	0.056

Table 11 compares patients with breast carcinoma with those with no carcinoma in regards to obstetric history, no risky or protective association, and no statistically significant difference was found among the comparing groups. As shown in table 11.**).**

Table 11: Comparison of obstetric history between subjects with breast cancer and those with breast mass but not cancer (n=180).

Variable	Breast cancer *(n=33, 18%)*	Breast mass but no cancer *(n = 147, 82%)*	Odds ratio (95% Confidence Interval)	P value
Breast feeding first child, n (%)	21 (64%)	111 (76%)	0.561 (0.095-3.094)	0.421
Breastfeeding last-child, n (%)	18 (55%)	81 (55%)	1.000 (0.127-2.018)	0.973
Birth control, n (%)	9 (27%)	27 (18%)	1.684 (0.221-4.772)	0.505

Table 12 explores a comparison between the patients with breast cancer and those with no cancers in regards to gynecological history, having a regular cycle was seen to be protective (odds ratio 0.240) and statistically significant difference (P value <0.05) between the comparing groups (more prevalent among patient with breast mass with no cancer group). Additionally; late menopause, was risky (odds ratio 10.523), and statistically significant difference (P value <0.05) between the two groups (as more subjects in the cancer group had menopause (91%) compared to the non-cancer group (49%)). Patients with reported issues with the breast similarly had a risky association (odds ratio= 35.848) and statistically significant difference (P value <0.05) between the two groups (more likely prevalent in the cancer group versus the non-cancer group). No risky or protective association was found regarding the terms of age at menarche, hormonal use after menopause, and hormonal stimulation for ovulation. As shown in table 12.

Table 12: Comparison of gynecological history between subjects with breast cancer and those with breast mass but not cancer (n=180).

Variable	Breast cancer *(n=33, 18%)*	Breast mass but no cancer *(n = 147, 82%)*	Odds ratio (95% Confidence Interval)	P value
Regular cycle, n (%)	15 (46%)	114 (78%)	**0.240 (0.060-0.906)**	**0.033**
Menarche at younger age, n (%)	19 (55%)	67 (46%)	1.434 (0.365-1.981)	0.128
Late Menopause, n (%)	30 (91%)	72 (49%)	**10.523 (1.237-87.705)**	**0.011**
Hormonal use after menopause, n (%)	0 (0%)	15 (10%)	0.623 (0.095-2.094)	0.573
Hormonal stimulation for ovulation, n (%)	15 (46%)	48 (33%)	1.729 (0.322-6.021)	0.421
Issues with the breast, n (%)	30 (91%)	33 (22%)	**35.848 (2.234-130.568)**	**<0.001**

CONCLUSIONS

From this study, we conclude that:

1. Breast mass and carcinoma are caused by multi-risk factors.
2. Having a positive family history and obesity significantly increases the risk of having breast cancer.
3. Individuals with menarche at younger ages are more liable for having breast mass.
4. Breast feeding of the last child is a protective factor from breast mass.
5. Both breast mass and breast cancer occurred in post menopaused women more frequently.
6. Hormonal stimulation for ovulation can be considered as a risk factor for breast mass but not for breast cancer.
7. About 33 % of fine needle biopsy results were malignant. Lipoma and fibroadenoma are the most prevalent types of benign breast masses. More than eighty percent of breast cancer patients were treated by radiotherapy.

RECOMMENDATIONS

1. Controlling modifiable breast mass and breast cancer risk factors, is very important and has a crucial role in decreasing the overall disease burden and improving prognosis.
2. Implementing screening programs in Iraqi health institutions is very important to decrease the disease burden.
3. Breast mass should take serious caution, especially among those with breast cancer risk factors.
4. More prospective research is recommended for studying genetics, and environmental issues which can cause breast mass in general and breast cancer in specific.
5. Being physically active can help lower your risk of getting breast cancer.

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