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Positive Mammography in Women Attending Early Detection Clinics Of Breast Diseases in Basra City From (2018-2019)

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ABSTRACT

Screening mammography offers the possibility of discovering malignant disease at an early stage, which is consequently treated early, thereby reducing the mortality rate. Studies regarding the relationships between mammographic density and breast cancer risk factors are limited in Iraq, where established risk factors are more prevalent than Western countries. The purpose of the study is to estimate the prevalence rate of positive mammography and to assess the risk factors of breast problems to those women attending early detection clinic of breast disease in Basrah city from (2018-2019). The study included 2026 anonymized mammographic images participating for breast screening for various causes in two clinical centers (Al-Sader Teaching Hospital and Al-Basrah Teaching Hospital). All data were collected and reviewed from patient's files, followed by adjustments and exclusions for files out of our requirements. The data were analysed using the IBM SPSS Statistics . The prediction ability of the significant variables were assessed using Multinomial logistic regression test.P-values <0.05 were considered as statistically significant. Most patients were within BI-RADS I representing 58.9% of the study population while the least were within BI-RADS VI representing only 0.2%. Multinomial logistic regression showed that age categories (40-50 years, 50-60 years) were a risky of being BI-RADS IV. Patients with illiterate, primary, and secondary school education levels had a high chance to be BI-RADS VI (coefficients 3.339, odd ratio: 28.185),), (coefficients 2.637, odd ratio: 13.967), (coefficients 2.319, odd ratio: 10.167) respectively in comparison with university education in which considered as a predictor for BI-RADS V. The Irregularity of the menses had a strong prediction of being BI-RADS VI (coefficients 3.274, odd ratio: 26.413) and V (coefficients 2.073, odd ratio: 7.947). Meanwhile, Patients not breast lactated and multiparous have a high chance to have BI-RADS V (coefficients 2.769, odd ratio: 15.935), (coefficients 3.730, odd ratio 41.697) respectively rather than others. Also patients with no family history of breast cancer tends to have score I rather than II and V in comparison with those with positive family history. In case of the exogenous hormonal use, patients with history of contraceptive pills and hormonal therapy use had a chance of having scores VI and V in case of contraceptives only. On the other hand, those presented with breast mass have a strong positive predictor to have BI-RADS V (coefficients 2.233, odd ratio: 9.331) and VI (coefficients 3.960, odd ratio: 52.433). Most of the enrolled patients in the study were within BIRADS I. Menopausal aged women, high educated levels, with irregular cycle, multiparous, positive family history, not breast lactated, history of exogenous hormonal use, and complaining from breast mass have high chance to be high grades mammographic scores.
.Keywords: Mammography, Screening, X-ray mammography, Breast density

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INTRODUCTION

Screening mammography offers the possibility of discovering malignant disease at an early stage, which is consequently treated early, thereby reducing the mortality rate. Studies regarding the relationships between mammographic density and breast cancer risk factors are limited in Iraq, where established risk factors are more prevalent than Western countries. Screening mammography offers the possibility of discovering malignant disease at an early stage, which is consequently treated early, thereby reducing the mortality rate (1). Mammographic screening is characterized by the availability, rapid, and cheap imaging in contrast to other modalities in which make mammogram as the gold standard and the appropriate technology for that purpose. Mammogram plays a major role either in screening a symptomatic patients or diagnose symptomatic ones and it's important and uses through the past three decades lowers the mortality rates of breast malignant (2).In case of screening, the fundamental issue is to distinguish the suspiciously malignant from those required further investigations. The radiologist start to classify the breast images according to AI model, using BIRADS scores (Breast Imaging-Reporting and Data System)

in which graded from 0-6 ((0) Incomplete, (1) Negative (normal), (2) Benign finding, (3) Probably benign finding, (4) Suspicious abnormality, (5) Abnormality, highly suggestive for malignancy and (6) Known biopsy-proven malignancy. Suspicious abnormalities go under biopsy test (usually BIRADS 4 and 5) to distinguish between cancerous and yet benign pathologies. The biopsy is the final diagnostic modality in which positive results indicate cancerous lesion and negative for a benign finding (3).

1.1 Breast diseases

1.1.1 Benign breast diseases

Benign breast diseases constitute a heterogeneous group of lesions arising in the mammary epithelium or in other mammary tissues and they may also be linked to vascular, inflammatory or traumatic pathologies (4). The term benign breast disease is a wide range term referred for a lot of non-malignant lesions such as traumatic lesions, tumour, and mastalgia(5). The incidence of benign breast lesions begins to increase through the second decade of life and peaks in the fourth and fifth decades, while, in malignant diseases the incidence continues to increase after menopause although at a less rapid pace (6). Approximately one million women are diagnosed annually with benign breast disease in the United State (7).

1.1.2 Breast cancer

The latest WHO estimation consider breast cancer as the most prevalent malignancy worldwide in 154 out of 185 countries and it is the major cause of cancer related mortality in more than 100 countries. Unfortunately, it remains the most common cancer among women accounting for 25% of the registered female cancers; with approximately 2.1 million for newly diagnosed cases in 2018 (8).

Breast cancer is the most frequent cancer in females. Its incidence is higher among developed countries than in developing ones mainly due to variation in risk exposure and better detective methods (9). The global burden of breast cancer in women measured by incidence or mortality, is substantial and increasing in several countries (10).

Breast cancers are multifactorial, hence, various factors contribute to its occurrence. In spite of the disease occurrence all over the world, its incidence, mortality, and survival rates vary among different parts of the world, which might be due to different factors such as population structure, lifestyle, genetic factors, and environments (11). Lifetime risk of developing breast cancer in every woman in the United States is 12.4% or one in eight women (12).

In Iraq, breast cancer represent the first among top ten malignant tumours affecting the community comprising 19.5% of total (4996 cases) and 34.3% of female cancers (4922 cases). During 2016, about 897 women died from that disease which is registered as the first cause of cancer related mortality among Iraqi females (23.6%) (13, 14).

In Basrah, people with cancer are mainly recognized and diagnosed when they visit specialist doctors in the private clinics, the consultancy clinics in major hospitals, and centres are specialized to deal with such cancers. Few cases may be detected in primary health care institutions. In each of the major hospitals, a cancer registration unit exists, incidence rates per 100,000 females of breast cancer in Basrah in 2010 was (24.7), in 2011 was (23.2), and in 2012 was (25.4) (15).

Internationally, breast cancer is the most common cancer, in India, nearly 145,000 new patients were diagnosed with breast cancer by 2012 (16). In Saudi Arabia, the incidence of breast cancer was 3400 by 2016 (17). In Turkey, complete prevalence distributions of patients (with invasive breast cancer) younger than 40 and 50 years old were 1.1% and 7.5%, respectively, on 2015 (18).

1.3.2.1 Risk factors of breast cancer

1.3.2.1.1 Demographic factors

1- **Race**: Hispanic ethnicity and black race have been associated with later stage at breast cancer diagnosis (19). Compared with white women in the United States, black women tend to have more aggressive breast cancers that present more frequently as estrogen receptor (ER) negative tumors (20).

2- **Age:** It is the most important known risk factor for breast cancer, the incidence rate of breast cancer increases significantly with age and reaches its peak in the age of menopause and then gradually reduce or stay constant (21, 22).

3- **Age at Menarche, Parity, and age at first live birth;** Younger age at menarche, multiparty, and older age at first full-term pregnancy are very well established risk factors for breast cancer that may affect breast cancer risk through long-term effects on sex hormone levels in premenopausal women through long-lasting changes in breast or by other biological mechanisms (23).

4- **Age at menopause:** Risk of breast cancer increases when the age of menopause above 50 years (22).

5- **History of Benign breast disorders:** Cancer is a multifactorial disease, and benign breast diseases are one of the most important risk factors for breast cancer (24).

6- **Family history of breast cancer:** It is an important risk factor for breast cancer. About 13% to 19%

of women when diagnosed with breast cancer have a first-degree relative with breast cancer (mother, daughter, or sister) compared with slightly fewer (8%– 12%) of women without breast cancer(25).

7- **Exposure to radiation:** Radiation enhance the risk of breast cancer by directly producing DNA damage and by altering common cellular and intracellular functions. Exposure to ionizing radiation also could lead to breast cancer development by indirectly influencing the ability of hormones or other chemical substances (26).

1.3.2.1.2 Life style factors:

1- **Obesity and overweight:** Obesity is correlated with breast cancer due to higher rates of conversion of androgenic precursors to oestrogen through peripheral aromatization in adipose tissue. Also, high levels of insulin and insulin-like factors in response to obesity can stimulate the growth of cancer cells (25).

2- **Lactation:** It reduces risk of breast cancer in women and is an important modifiable preventive behaviour. Longer duration of breastfeeding has been associated with a greater reduction in breast cancer risk (27)

3- **Physical Activity:** It is a considerable evidence from epidemiological studies that high state of physical activity decrease breast cancer risk in women (28).

4- **Smoking:** It is not an established risk factor for breast cancer, but increasing evidence supports there is an association partly for women who initiated smoking before first childbirth (29).

5- **Diet:** In recent years, about 38% of breast cancers were due to diet. There is a plausible role for dietary fat composition in breast cancer path physiology (30, 31).

6- **Coffee:** The data on coffee consumption and breast cancer risk are controversial, in spite of different studies did not support the role of coffee in breast cancer risk (32).

1.3.2.1.3 Other factors

1- **Mammographic Breast Density:** Breast density is one of the strongest established risk factors for breast cancer. Women with more extensive mammographic density have over a fourfold increased risk of breast cancer (33).

2- **Hormonal contraceptive:** Recent reports showed a higher breast cancer risk among women who were using or recently used contemporary hormonal contraceptives as compared with women who had never used them (34).

Diagnosis

Most women undergo breast changes in their life due to normal growth and changes in hormone. So that, lumps, breast pain, nipple discharges, or skin irritation are examples of breast problems. The majority of breast lesions and abnormalities happen in the breast are not cancerous but are far more frequent than malignant ones (35).

Breast lesion investigations include self and clinical breast examination, X-ray mammography, and FNA. In addition, a variety of other efficient complementary imaging modalities provide additional information to achieve a definite breast diagnosis (3).

Screening with mammography uses X-ray imaging to find breast cancer before a lump can be felt. The goal is to treat cancer earlier, when a cure is more likely. Women invited to screening should be fully informed of both the benefits and harms. To help ensure that the requirements for informed choice for women contemplating whether or not to attend a screening program can be met (36).

The purpose of the study is to estimate the prevalence rate of positive mammography and to assess the risk factors of breast problems to those women attending early detection clinic of breast disease in Basra city from (2018-2019).

MATERIAL AND METHODS

The study included 2026 anonym zed mammographic images participating for breast screening for various causes in two clinical centers (Al-Sader Teaching Hospital and Al-Basrah Teaching Hospital). All data were collected and reviewed from patient's files, followed by adjustments and exclusions for files out of our requirements. The data were analysed using the IBM SPSS Statistics.

All data were collected and reviewed from patient's files, followed by adjustments and exclusions for files out of our requirements. The enrolled files contain all the required data that fulfill our questioner.

Definition of variables

- **Age:** the age categorized into 10 year interval groups including:
  - Less than 30 year.
  - 30-39 year
  - 40-49 years

- 50-59 years
- 60-69 years
- More than 70 years

- **Education**: This was recorded as completed stages of formal schooling and grouped as following:
  - **Illiterate** : individual who cannot read and write
    Primary : individual who had complete their primary school
  - **Secondary**: individual who completed their secondary education
  - **University**: individual who completed the university education.
- **Occupation**: the current job of the patients.
  - **Employed:** Any participant who works in governmental or Privet work.
  - **Non-employed**.
- **Address**: the current place in which the patient lives.
  - **Urban:** Patients live in built-up area, in which a human settlement with a high population density and infrastructure of built environment.
  - **Rural:** Patients live in a geographic area that is located outside towns and cities
- *Marital status:*
  - **Married**
  - **Un married**
- **Regularity of menses**: Either regular or not (the regularity of menses decided if the length of the patient menstrual cycle (the gap between periods starting) keeps changing.
- **Age at menarche**: age at which first menstrual bleeding happened.
- **Obstetrical history**: history regarding the obstetrical information, including
  - **Nullipara**: women who have never born a child
  - **Parous woman**: woman who has had one or more pregnancies resulting in potentially viable offspring.
- **Family history of breast cancer**: history of first degree relative of breast cancer.
- **Chief complaint**: the main complaint that make the patients seeking medical advice.
  - **Mastalgia**: Any breast pain felt by the patient.
  - **Nipple discharge:** any serous like material, discharged from the nipples.
  - **Breast mass**: any lump like mass felt by the patients or by the clinician.
  - **Routine check-up**: clinical breast examination every 2-3 years for females >20 years old up to 30 years old, and annually for females >30 years (37).
- **Hormonal use**: history of hormonal use (progesterone and oestrogen) either in form of contraceptive pills, hormonal therapy or no history of use.
- **Way of detection**: How the patients detect the chief complain either by herself or by the clinician or others (neither the clinician, nor himself but by relatives or friends).
- **BI-RADS of the breast**: classification of mammographic results according to Breast Imaging-Reporting and Data System scores (4).
- **Breast lactation**: whether the female breast lactated or not.
- **Hospital attending**: the name of the hospital in which patient attended for mammographic screening.
- **Side of the breast**: the tested side of the breast whether left or right.
- **Year of attendance**: the year in which the patient attended the hospital.

RESULTS

Most patients were within BI-RADS Ⅰ representing 58.9% of the study population while the least were within BI-RADS Ⅵ representing only 0.2%. Multinomial logistic regression showed that age categories (40-50 years, 50-60 years) were a risky of being BI-RADS Ⅳ. Patients with illiterate, primary, and secondary school education levels had a high chance to be BI-RADS Ⅵ (coefficients 3.339, odd ratio: 28.185),), (coefficients 2.637, odd ratio: 13.967), (coefficients 2.319, odd ratio: 10.167) respectively in comparison with university education in which considered as a predictor for BI-RADS Ⅴ. The Irregularity of the menses had a strong prediction of being BI-RADS Ⅵ (coefficients 3.274, odd ratio: 26.413) and Ⅴ (coefficients 2.073, odd ratio: 7.947). Meanwhile, Patients not breast lactated and multiparous have a high chance to have BI-RADS Ⅴ (coefficients 2.769, odd ratio: 15.935), (coefficients 3.730, odd ratio 41.697) respectively rather than others. Also patients with no family history of breast cancer tends to have score Ⅰ rather than Ⅱ and Ⅴ in comparison with those with positive family history. In case of the exogenous

hormonal use, patients with history of contraceptive pills and hormonal therapy use had a chance of having scores VI and V in case of contraceptives only. On the other hand, those presented with breast mass have a strong positive predictor to have BI-RADS V (coefficients 2.233, odd ratio: 9.331) and VI (coefficients 3.960, odd ratio: 52.433).

Table 3.1 Demographical data of the enrolled patients. Variables No. %

Age	<30	16	0.8
	30-39	232	11.5
	40-49	736	36.3
	50-59	712	35.1
	60-69	306	15.1
	>70	24	1.2
Occupation	Employed	224	11.1
	Non employed	1802	88.9
Marital status	Married	1950	96.2
	Un married	76	3.8
Address	Urban	1816	89.6
	Rural	210	10.4
Education	Illiterate	272	13.4
	Primary school	758	37.4
	Secondary school	830	41.0
	University	166	8.2
Year of attending	2018	1110	54.8
	2019	916	45.2
Hospital attending	Basrah teaching hospital	1302	64.3
	Al-Sader teaching hospital	724	35.7

Among the attended females for breast mammographic screening, (73.5%) detected her first signs by herself, while (25.5%) were detected by clinicians. Most of those patients presented with mastalgia (83.9%) followed by breast mass (10.4%), and routine check-up occupy the least complain by (0.2%). About 53.4% of the enrolled patients were screened in their left breast. (96.3%) of them had no previous breast disease, while (84.5%) encountered no family history of breast cancer.

Table 3.2 Breast disease related data distribution of the enrolled patients.

Variable	**No.**	**%**	
Way of detection	Clinician	516	25.5
	Herself	1490	73.5
	Others	20	1.0
Chief complaint	Nipple discharge	112	5.5
	Breast mass	210	10.4
	Mastalgia	1700	83.9
	Routine check up	4	.2
Family history of breast disease	Yes	314	15.5
	No	1712	84.5
Obstetrical history of breast disease	Multipara	1884	93.0
	Nullipara	142	7.0
Hormonal use	Contraceptive	1324	65.4
	Hormonal therapy	14	.7
	Not use	688	34.0
Breast lactation	Yes	1866	92.1
	No	160	7.9
Side of the breast	Right breast	945	46.6
	Left breast	1081	53.4

Table 3.6 Breast disease related data distribution among BI-RADS scores

Way of detection	Clinician	63 12.2%	293 56.8%	90 17.4%	42 8.1%	20 3.9%	6 1.2%	2 0.4%	0.13
	Herself	176 11.8%	885 59.4%	223 15.0%	90 6.0%	100 6.7%	14 0.9%	2 0.1%	
	Others	3 15.0%	16 80.0%	0 0.0%	1 5.0%	0 0.0%	0 0.0%	0 0.0%	
Chief complaint	Nipple discharge	7 6.3%	76 67.9%	14 12.5%	9 8.0%	5 4.5%	1 0.9%	0 0.0%	<0.05
	Breast mass	15 7.1%	115 54.8%	39 18.6%	20 9.5%	13 6.2%	6 2.9%	2 1.0%	
	Mastalgia	220 12.9%	1002 58.9%	260 15.3%	102 6.0%	102 6.0%	12 0.7%	2 0.1%	
	Routine check up	0 0.0%	1 25.0%	0 0.0%	2 50.0%	0 0.0%	1 25.0%	0 0.0%	

The regularity of menses were associated with BI-RADS 0 (ASR -3.0), Ⅴ (ASR 4.6), Ⅵ (ASR 3.1).
Family history of breast disease was significantly associated with BI-RADS Ⅰ (ASR -6.0), Ⅱ (ASR 3.5), and Ⅲ (ASR 4.6). Whilst, obstetrical history showed an association with BI- RADS Ⅰ (ASR 4.4), Ⅱ (ASR -3.4), and Ⅵ (ASR -3.4).

DISCUSSION

As we analysed this results, we can easily notice that age, educational level, regularity of the menses, chief complain, previous breast disease, family history, parity, lactation, and hormonal use are highly associated with different BIRADS score.
One of the main risk factors of breast cancer is aging which plays a significant role in its pathogenesis due to genetic instability, telomere attrition, epigenetic alteration, stem cell exhaustion associated with aging, the risk increases from 50 years to 70 years and above (38). our study showed that menopausal age (40-60 years) is a predictor risk of being BIRADS score Ⅳ (which is more probable malignant) which is in agreement with a study done in 2016 by Habib to assess the prevalence of breast cancer in Basrah from 2005-2012, in which he found that a great percentage of the affected patients (57%) were within the menopausal age (40-60 years) (39). Another local study estimated that 30.4% of the affected females with breast cancer in Basrah were within the age of 40-60 year (40). Abood in 2018 found that approximately 60% of the affected females diagnosed with breast cancer were within 40-60 years (41). Younger people were presented as a negative predictor of having high scores BIRADS especially score IV, which is similar to other results mentioned in previous studies (40-41).
Illiterate females showed a higher percentage of getting BIRADS Ⅵ comparing to primary, secondary and university levels. And these results can be justified by the late presentation, lack of the health education, or unawareness of those people with such symptoms and signs. But in case of BIRADS Ⅴ university education showed a significant association with it rather that other educational levels and that's similar to a study by Sezer et al in which having over 11 years of education was significantly associated with breast cancer (42). Yilmaz et al also indicated that the risk for developing breast cancer in academic women is higher than for housewives (43). Whereas Özmen et al found that higher education was a protective variable for breast cancer, in which the duration of education (≥ 13 years) was associate with decreased breast cancer risk (95% CI 0.62–0.81) (44). Sezer and colleagues explained relationship between education and breast cancer to be related to lifestyle differences that occur in women with higher education (42).

CONCLUSION

Most of the enrolled patients in the study were within BIRADS I, followed by BIRADS II and then III, IV, V, VI descending assortment.
Menopausal aged women seems to have high risk of developing BIRADS IV scores in mammographic screening, while high educated levels, irregular cycle, multiparous, positive family history, no breast feeding, history of exogenous hormonal use, and complaining from breast mass were found to have high chance to be high grades (V and VI) mammographic scores.

RECOMMENDATIONS

1. An interventional follow up study should be established to ensure the direct effect of multiple risk

factors on mammographic density.
2. Specific confounding factors should be adjusted (such as age, BMI and else) to minimize its effect on the results.
3. A study based on direct data inquiring from patients to obscure the incorrect data collection.
4. Other susceptive risk factors should be considered for more different results.
5. Availability of breast cancer screening guideline programe in each screening center.
6. Implementation of an electronic medical recording system in all screening system in Basrah.
7. Breast Imaging-Reporting and Data System model should by applied in all screening centers.

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