Epidemiological Profile of Breast Fibroadenoma in a Sample of Iraqi Women Attending Breast Clinic at Al-Imamaein Al-Kadhimaein Medical City in Baghdad/Iraq

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Abstract

Background: Fibroadenoma, a type of fibroma, is the most common benign neoplasm found in the breast. It is predicted that around 10% of females globally may experience the development of fibroadenoma at some stage in their lives. Fibroids seldom become malignancies, about 5% of all cases. Fibroadenoma etiology is uncertain. However, levels of estrogen influence fibroadenomas. **Objectives:** The objectives of this study were to explore the epidemiological aspects of breast fibroadenoma. **Patients and Methods:** A cross-sectional study was conducted in the breast examination clinic at Al-Imamaein Al-Kadhimaein Medical City in Baghdad/Iraq. It included 260 female participants aged 15–35 years, diagnosed by specialists with breast fibroadenoma. A modified four-part questionnaire was used to obtain data from participants which includes sociodemographic, breast fibroadenoma risk factors, clinical presentation, and diagnostic intervention. **Results:** Participants had a mean age of 27.3 ± 6.05 years. It was found that 37.7% of participants were overweight women, 35.8% had a family history of fibroadenoma. The most common presentation was pain presented in 38.1%. **Conclusions:** The fibroadenomas that developed in the current study sample tended to increase in the second and third decades, notably among nulliparous and nonlactating women. Most participants were overweight with left-sided pain and lumps.

Keywords: Body mass index, epidemiology, estrogen, fibroadenoma, hormones

Introduction

Fibroadenomas are benign biphasic breast tumors that are made of epithelial and stromal parts, and they originate from the terminal duct lobular unit. It is most common in young women, particularly in their second or third decade of life, but it can happen to women of any age.[1] The incidence of fibroadenoma decreases with age and is frequently found in females in the overall population before reaching the age of 30. It is predicted that around 10% of females globally may experience the development of fibroadenoma at some stage in their lives. The transformation of a fibroadenoma into a malignant lesion is rare, occurring in about 5% of cases.[2] With the medical word known as fibroadenoma "fibro" refers to the stromal tissue, "adenoma" refers to the glandular structure seen in epithelial tissue, and "oma" simply means "tumor," inferring that histologically.[3] Fibroadenomas manifest as discrete and movable spherical nodules, exhibiting a well-defined growth pattern without any attachment to the surrounding breast tissue, and because fibroadenomas are not attached to the surrounding parenchyma and move around beneath the palpating fingers, they are referred to as breast "mouse."[4]

Fibroadenoma is the most common benign neoplasm of the female breast.[5] The prevalence of this condition is highest among individuals in the adolescent age group, whereas its occurrence among postmenopausal women is rather infrequent.[6] The prevalence of fibroadenoma has a negative correlation with age, with a higher likelihood of occurrence observed in females among the general population before reaching 30 years of age.[2]

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The precise cause of fibroadenomas remains uncertain. Nevertheless, several studies have demonstrated that the formation of fibroadenomas is impacted by the level of estrogen in the body.[4] Fibroadenoma typically exhibits growth during pregnancy and demonstrates a tendency to undergo regression during the menopausal phase. This finding provides support for the hormonal etiology theory. According to a certain study, it has been observed that a significant number of females take oral contraceptives before reaching the age of 20, they may be afflicted with fibroadenoma.[7] A family history of breast disease has been linked to fibroadenoma in several studies.[8] Elevated body mass index (BMI) has been identified as an important risk factor in the pathogenesis of fibroadenoma, with a particular emphasis on its association with early teenage girls.[9] The majority of fibroadenomas are typically devoid of symptoms.[1] Fibroadenoma often manifests as a palpable lesion with a pliable consistency and mobility. The predominant location of these entities is commonly observed within the left breast, particularly in the upper outer quadrant. However, in 20%–25% of cases, it can be bilateral as well as multiple.[10]

A sonographic image of the breast region under investigation is generated through the utilization of sound waves. Ultrasonography is done on people under 35 due to dense breast tissue,[11] whereas a mammogram is a diagnostic procedure that uses X-rays to assess potentially abnormal masses in women who are 35 years of age or older.[12] In postmenopausal individuals, it is common to observe calcification, which frequently manifests as the characteristic appearance of popcorn calcification.[13] Regarding breast biopsy, fine-needle aspiration cytology or needle core biopsy can detect fibroadenoma.[14] If imaging shows questionable signs or if clinical symptoms, such as fast development, could affect surgical planning, a core needle biopsy is recommended.[12]

Due to the lack of studies on breast fibroadenoma in Iraq, this study presents a comprehensive overview and underlines the need to enhance the epidemiological profile in a sample of Iraqi patients. Hence, the objectives of the current study aimed to explore the epidemiological aspects that link to fibroadenoma.

Patients and Methods

This cross-sectional study was conducted in the breast examination clinic at Al-Imamaein Al-Kadhimaein Medical City during the period from January 10th, 2023, to July 10th, 2023, for approximately 3 h per day and three times weekly. A convenient sample of 260 women diagnosed by specialists based on the combination of clinical examination, imaging, and pathological analysis (the triple assessment) with breast fibroadenoma who accepted participation was included in the study. The age range of the participants involved in our study was between 15 and 35 years. The measurement of weight was conducted using a standardized beam scale placed on a stable-level platform with the unit of measurement being kilograms. Similarly, the measurement of height was obtained using a stadiometer, with the unit of measurement being centimeters. BMI was calculated by the formula: weight in kg/height in squared meter.[9] Data were collected through a face-to-face interview with the participants using a modified questionnaire, which was adopted from previous studies.[15-17] The questionnaire was written in English and consists of four parts, including the following:

- Sociodemographic questions regarding personal data (age, marital status, education level, job position, and smoking)
- Some factors affecting breast fibroadenoma (menarche, menstruation, pregnancy, lactation, contraception, hormonal therapy, BMI, and family history of fibroadenoma)
- Clinical presentation (breast pain or tenderness, breast lump, breast shape or color change, and nipple changes or discharge), number of masses, and side of the lesion
- Diagnostic intervention (clinical examination, imaging, and histopathology).

Inclusion criteria: female patient, age between 15 and 35 year old, diagnosed with single or multiple fibroadenomas. Exclusion criteria: other benign breast diseases, breast cancer, or had been treated for any malignancies.

Ethical and Scientific approval for the research was obtained from the Scientific Committee at the Scientific Counsel of Family and Community Medicine, Iraqi Board for Medical Specialization. After explaining the purpose of the study and assuring confidentiality, verbal consent was obtained from all patients before each interview.

The collected data were introduced into Microsoft Excel sheet 2021, then loaded into the SPSS Statistical Package for the Social Sciences (version 20.0 for Windows, SPSS, Chicago, IL, USA). The descriptive statistics were presented using tables and graphs. Quantitative data were represented as mean and standard deviation (SD). Qualitative data were represented as counts and percentages. Regarding the analytics of statistics, the Chi-square test was used to test the relation between risk factors. $P \leq 0.05$ was considered a significant relation.

Results

The results showed that 260 patients with fibroadenoma were recruited in the current study. The age range of the participants involved in the study was between 15 and 35 years and the mean age and SD were 27.3 ± 6.05 years. The mean age of menarche and SD was 12.85 ± 1.31, as shown in Table 1. In the current study, the result of regular menstruation in participants was 75.4%, as shown in Table 2.

Table 1: Distribution of studied sample (n=260) according to the mean of age and menarche, in Al-Imamaein Al-Kadhimaein Medical City, Baghdad, 2023

	Mean±SD
Age	27.73±6.05
Menarche	12.85±1.31

SD: Standard deviation

The current results indicate the following job statuses: employees were 76 women, accounting for 29.8% of the total and homemakers were 179 women, making up 70.2% of the whole [Table 2]. The highest percentage of participants in the current study has an intermediate or secondary school education level, accounting for 34.6%. In addition, 31.2% of participants have a university or higher education level, as shown in Table 2.

Table 2: Distribution of the studied sample (n=260) according to sociodemographic data of participants, in Al-Imamaein Al-Kadhimaein Medical City, Baghdad, 2023

	Count (%)
Age	
<20	26 (10.0)
20–24	51 (19.6)
25–29	58 (22.3)
30–34	87 (33.5)
>34	38 (14.6)
Menarche	
<11	8 (3.1)
11	21 (8.1)
12	77 (29.6)
13	83 (31.9)
14	45 (17.3)
15	19 (7.3)
>15	7 (2.7)
Menstruation	
Regular	196 (75.4)
Irregular	64 (24.6)
Pregnancy	
Nulliparous	105 (40.4)
1 birth	18 (6.9)
2 births	47 (18.1)
3 births	33 (12.7)
≥4 births	57 (21.9)
Lactation	
Nonlactating	142 (54.6)
Currently lactating	12 (4.6)
History of lactation	106 (40.8)
Marital	
Unmarried	83 (31.9)
Married	167 (64.2)
Divorced	7 (2.7)
Widow	3 (1.2)
Job-status	
Employee	76 (29.8)
Homemaker	179 (70.2)
Education	
Illiterate	18 (6.9)
Elementary	71 (27.3)
Intermediate and secondary school	90 (34.6)
University and higher	81 (31.2)
Smoking	
Never	246 (94.6)
Current	13 (5.0)
Former	1 (0.4)

Table 3 shows several risk factors that have the potential to influence the development of fibroadenoma disease. Regarding the BMI, 98 (37.7%) of individuals were overweight, whereas 47 (18.1%) were obese, as shown in Table 3. The study results in the current study revealed that 93 (35.8%) of participants had a familial history of fibroadenoma.

In the current study, the most frequent symptom reported was breast pain, which was noted in 99 individuals, accounting for 38.1% of the cases. The second-most frequently observed symptom was a breast lump, reported by 96 participants, representing 36.9% of the cases, as shown in Table 4. The current study result revealed that out of the total participants, 120 (46.2%) participants had a single breast mass, 85 (32.6%) participants had two masses, and 55 (21.2%) participants had three or more masses, as shown in Table 5. The current study found that the lesion was on the left side in 105 participants, making up 40.4% of the total, as shown in Table 5.

Table 3: Distribution of the studied sample (*n*=260) according to risk factors of fibroadenoma, in Al-Imamaein Al-Kadhimaein Medical City, Baghdad, 2023

	Count(%)
BMI	
Underweight	4 (1.5)
Normal weight	111 (42.7)
Overweight	98 (37.7)
Obese	47 (18.1)
HRT	
Yes	28 (10.8)
No	231 (89.2)
OCP	
Never	181 (69.6)
POP	6 (2.3)
COP	71 (27.3)
POP + COP	2 (0.8)
Family history	
Yes	93 (35.8)
No	167 (64.2)

BMI: Body mass index, HRT: Hormonal replacement therapy, OCP: Oral contraceptive pills, POP: Progestin-only pills, COP: Combined oral pills

Table 4: Distribution of the studied sample (*n*=260) according to signs and symptoms in Al-Imamaein Al-Kadhimaein Medical City, Baghdad, 2023

Presentation	Count(%)
Pain	99 (38.1)
Lump	96 (36.9)
Breast shape or color changes	1 (0.4)
Nipple changes and discharge	3 (1.2)
None “checkup visit”	14 (5.4)
Pain + lump	40 (15.4)
Lump + shape	1 (0.4)
Pain + nipple changes	4 (1.5)
Pain + lump + nipple changes	1 (0.4)

While all participants in the study were found to have fibroadenomas based on positive clinical examination results, only 4.6% required a combination of both ultrasonography and mammography to reach a conclusive diagnosis; the remaining 95.4% were diagnosed using ultrasound alone, as shown in Figure 1.

Discussion

In this study, 260 patients who were selected had fibroadenoma, and they all fulfilled the diagnostic criteria for the condition. Participants' ages range from 15 to 35 year old, which is the age group that is most likely to be affected by fibroadenoma.[18]

In the current study, the results for mean age and SD were 27.73 ± 6.05 years, which was a close result of Grouthier *et al*.'s research, as the study participants' mean age and SD were 28.9 ± 9.9 years.[19] According to the results of the current study, the age group of participants comprising the largest portion was 87 (33.5%) which was between the ages of 30 and 34 years. The age group of participants with the second highest percentage was 58 (22.3%), corresponding to those in their second decade of age 25–29 years. These results were similar to those of a previous study conducted in China by Zhu *et al*.[20]

The results of the current study indicate that the menarche percentage was highest among two age groups, specifically at 12 and 13 years of age, with percentages of 29.6% and 31.9%. These results were also documented in another study in AL-Ramadi, Iraq, 2019 by Murshid, which showed that the mean age of menarche was 13.25 years.[21] Another study in Baghdad-Iraq 2017 by Al-Kaseer and Ismail showed that the menarche means and SD results were 11.8 ± 1.8 years.[22]

The number of participants in the current study who had regular menstruation was 196 (75.4%), which was close to the findings of another study conducted in Baghdad in 2021 by Ghasi *et al*., which revealed that the number of women who had regular menstruation was 94 (70.7%).[23] According to the findings of previous studies, regular menstrual cycles, as opposed to irregular cycles, were related to a considerably higher risk of fibroadenoma at premenopausal ages.[17]

According to the findings of a previous prospective study conducted in Shanghai, there was a marked reduction in the risk of fibroadenomas with increasing parity.[24] In the current study, the percentage of nulliparous women was 105 (40.4%), which closely aligns with the findings of a prior study conducted in Erbil City, Iraq, by Yousif and Yacoub In that study, the percentage of nulliparous women was reported as 43.6%.[25]

Lactation may affect fibroadenomas.[26] It is believed that hormones cause fibroadenoma to increase during pregnancy and regress postpartum. Ideally, hormone-dependent lesions like fibroadenoma may regress due to the decline in estradiol and progesterone levels soon after birth and prolactin levels after breastfeeding.[19] In the current study, the participants who were nonlactating were 142 (54.6%). These findings are consistent with the findings of a previous study conducted in Iraq by Yousif and Yacoub, which revealed that nonlactating women were 44 (19.4%).[25]

The current study found that 167 (64.2%) of participants were married, in comparison to a previous study that was performed in Pakistan by Akhtar *et al*., which reported a percentage of 49.4% of married women who complained of fibroadenoma.[27] This could be attributed to the fact that the majority of individuals who visit the breast examination clinic are married, possibly because unmarried women may feel uncomfortable about attending and undergoing a breast examination. In the current study, 179 (70.2%) of the participants were homemakers, which was comparable to the

Table 5: Distribution of the studied sample (n=260) according to characteristics of fibroadenoma experienced by participants in Al-Imamaein Al-Kadhimaein Medical City, Baghdad, 2023

	Count(%)
Number of masses	
One	120 (46.2)
Two	85 (32.6)
≥3	55 (21.2)
Side of lesion	
Right	88 (33.8)
Left	105 (40.4)
Bilateral	67 (25.8)

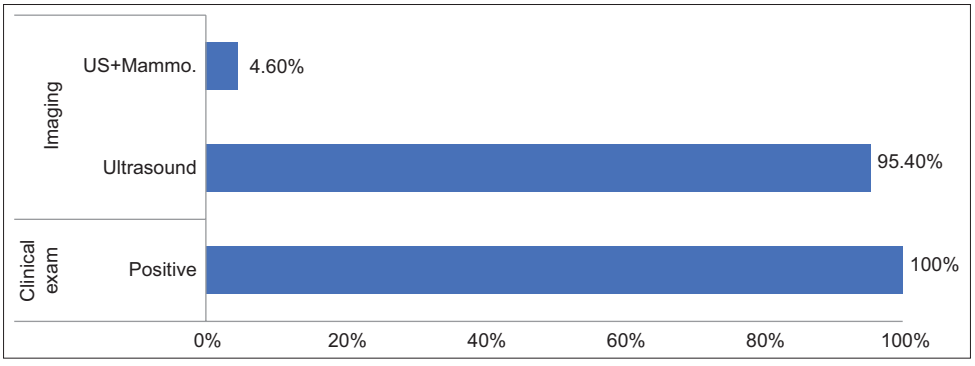

Figure 1: Clinical examination and imaging studies

result of Ghasi *et al*., who found that 73.7% of the participants were homemakers.[23]

The present study found that 90 (34.6%) of patients had an intermediate and secondary level of education, whereas 81 (31.2%) of women had a university or higher level of education. Contrary, Li *et al*.'s study in 2018 revealed that approximately 50.8% of women have achieved a university level of education.[28] The important role of the education level is seen by the degree to which patients adhere to screening, therapy, and lifestyle choices that have an impact on the manifestation and course of the disease. It has been found that women with higher levels of education are more likely to recognize lumps in their breasts and to bring breast lumps to the attention of their doctor.[29]

In the current study results for patients who never smoked 246 (94.6%), this percent did not supply enough evidence for risk estimation of smoking regarding fibroadenoma as a previous study in Iraq also suggested the same concept by Yousif and Yacoub[25] and which was also not observed in a similar study with similar women's behavior toward smoking done in Mazandaran in the North of Iran by Naieni *et al*.[29]

The results of the current study showed that the percentage of patients who were overweight and obese was 98 (37.7%) and 47 (18.1%), respectively. High BMI appears to have been discovered as an important marker in the pathogenesis of fibroadenoma, particularly in young adolescent females. This was reported in a study in Pakistan conducted by Bhettani *et al*., which found that out of 136 patients with high BMI, 42 (30.8%) had fibroadenoma.[9] It is advisable to motivate women with a high BMI to adopt a healthy lifestyle that helps them maintain a BMI within the normal range to prevent the development of fibroadenoma. Regarding the use of hormonal replacement therapy (HRT), the results of the current study showed that 28 (10.8%), used HRT, and the majority of them used this treatment for infertility issues by enhancing ovulation. This is in comparison to the findings of a previous study conducted in Sweden by Johansson *et al*., which demonstrated that current HRT use for 5 years or more was correlated with an increased risk of fibroadenomas.[17]

In the present study, 181 (69.6%) participants reported never having used oral contraceptives. These findings closely align with the results of a study conducted in Iraq by Ghasi *et al*.[23] In a prior study conducted in China by Nelson *et al*., it was found that the utilization of oral contraceptives was linked to a decreased likelihood of fibroadenoma.[24]

Regarding family history, it was found that among the participants in the current study, 93 (35.8%) women had a familial predisposition to a fibroadenoma. A study conducted in Indonesia by Eka Fitri and Khambri revealed a notable link between family history and the occurrence of fibroadenoma in adolescent girls.[30]

In the current study, the most prominent symptom of breast fibroadenoma was breast pain, reported by 99 (38.1%) patients. The second-most common symptom was the presence of a breast lump, reported by 96 (36.9%) patients. Regarding the location of the lesion, 105 (40.4%) of cases were found on the left side, 88 (33.8%) of cases on the right side, and 67 (25.8%) of cases were bilateral. These findings are being compared to a previous study conducted in Saudi Arabia by Alamri *et al*.[16] In the current study, there were 120 (46.2%) cases with a single mass and 140 (53.8%) cases having multiple masses. These findings were compared with a previous study conducted in Baghdad.[23] While the majority of individuals with fibroadenomas typically have only one mass, others may encounter multiple masses. Women who have multiple fibroadenomas are more prone to having a strong, multigenerational familial record of these lesions compared to those who have single fibroadenoma.[31]

The triple assessment is composed of the clinical breast examination, imaging studies, and histopathological evaluation of the breast. It will be possible for the diagnostic accuracy to reach 100% when all three assessments are carried out correctly.[32] All female participants in the current study presented with positive clinical findings of breast fibroadenoma. Out of these participants, 248 (95.4%) required an ultrasound scan for diagnosis, whereas 12 (4.6%) required both an ultrasound and mammography. This finding aligns with the results of a prior investigation conducted in Duhok, Iraq, by Ahmad Mohammed.[33] Mammography is not useful when evaluating breast masses in adolescents due to the low quality of the images caused by the dense fibroglandular tissue in young breasts. In addition, the risk of breast cancer in this age group is quite low. Hence, the preferred imaging modality is an ultrasound scan.[34]

Conclusions

Fibroadenoma is more common in the second and third decades, nulliparous and nonlactating women have more fibroadenomas, overweight and normal BMI participants predominate, and the most prominent symptoms are left-sided pain and lumps.

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Conflicts of interest

There are no conflicts of interest.

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