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Breast Mass Among Young and Adolescent Attending Al-Elwiya Teaching Hospital

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ABSTRACT

The purpose of this study was to evaluate the incidence and clinical manifestations of benign breast lumps in adolescents admitted to a Al-Elwiya Teaching Hospital. All adolescents who visited the outpatient department (OPD) with breast lump complaints were enrolled in the study. Patients were a one hundred cases with breast lump with age of 25 years or less. All patients had assessment in the form of short history, clinical examination, ultrasound examination and fine needle aspiration cytology (FNA). As fibroadenoma found in 10% of all women according to the Autopsy studies. Regarding body mass index, no statistical difference was found. According to the occupation and educational level, no difference in the diagnosis was found. Marital status had no difference on the diagnosis of breast mass. Nulliparity (together with gravidity, parity and miscarriage) were associated with high rate of fibroadenoma. The side of the breast mass, past surgical history, past medical history, smoking all were not different in regard to the diagnosis of breast mass. Although, both family history and 1st and 2nd degree relatives with benign breast disease were not significant different in regard to the diagnosis of breast mass; all cases of positive family history of fibroadenoma had the similar diagnosis in both 1st and 2nd degree relatives. Most common cause of benign breast mass is fibroadenoma. Fibroadenoma was more common in age group ranged from 15-21 years, cases of nulliparity, positive family history and hormonal treatment.

1. Introduction

Benign breast disease are ten times more common than cancer breast in younger age group [1]. Reassurance following exclusion of cancer is the key stone of management for majority of cases [2]. Thirty percent of women who suffer benign breast disorder required intervention, the aim is to exclude cancer and treat any remaining symptom [3]. Hormones and growth factors act on stromal and epithelial cells to regulate the development, maturation, and differentiation of mammary-gland cells [4]. Hormones that affect the breast include estrogen which responsible on the development and elongation of ductal tissue, progesterone

facilitates ductal branching and lobulo-alveolar development, and prolactin regulates milk protein production. At puberty, increasing levels of both estradiol and progesterone lead to initiate of breast development [5]. In the adult breast, cyclic changes occur during the menstrual cycle that result in an increased rate of cell proliferation during the luteal phase. An increase in breast size up to 15 percent may occur during this phase [6].

After the onset of puberty most cases of breast masses are benign fibroadenoma, fibrocystic, fibro-adenosis, infection, intramammary lymph node (IMLN) and fat necrosis [7]. In young female interventions may give rise to a disfigurement of the developing breast greater than that of mature breast. So the conservative approach on clinical and ultrasound follow-up is more common in this age [8]. A shift to cytological examination with suspicious masses according to American College of medicine Breast Imaging Recording and Data System ultrasound (BIRDS) [9]. Table 1 shows the BIRAD system with likelihood of malignancy [10].

The aim of the study: was to determine the frequency of different breast lesions in symptomatic women under 25 years and the value of radiological imaging in the diagnosis.

Table 1: BI-RAD system.

Cate or	Definition	Likelihood of cancer
BI-RADS 0	Incomplete	N/A
BI-RADS 1	Negative Essentially	0%
BI-RADS 2	Benign Essentially	0%
BI-RADS 3	Probably benign	>0%, but 2%
BI-RADS 4	Suspicious	>2%, but <95%
BI-RADS 5	Highly suggestive of malignancy	>95%
BI-RADS 6	Known biopsy-proven malignancy	N/A

2. Patients and methods

An observational study, that conducted at AL-Elwiya maternity teaching hospital — breast clinic.

Patients were a one hundred cases with breast lump with age of 25 years or less. All patient had assessment in the form of short history, clinical examination, ultrasound examination and fine needle aspiration cytology (FNA) which done for cases with BIRAD 4 or clinician preference in cases of BIRAD 3 and some patient had excisional biopsy surgically indicated. All FNA findings were reviewed and compared to radiological findings. The period of the study extended from 1st January to 1st October 2021.

Inclusion criteria:

- Age 25 years or less
- Breast lump

Exclusion criteria

- known case of breast cancer
- skin changes specific to breast cancer.

Ethical consideration:

Verbal consent was obtained from all patients, after explaining the nature of the study with conformation that this information would be used for research purposes only and it would be anonymous.

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Proposal of the study had been applied to and approved by scientific committee of Al-Elwiya Maternity Teaching hospital, before the start of the study.

Statistical analysis:
The collected data were introduced into Microsoft excel worksheet 16, and loaded into IBM — SPSS V26 to be used in statistical analysis.

Descriptive statistics were presented using tables (No. and frequency, means & standard deviations), Charts, while Chi square and Fisher-Freeman-Halton exact test were used to estimate the significance of categorical data. Normality of continuous variables was checked using Shapiro—Wilk test. ANOVA test used for the parametrical continuous variables and Kruskal Wallis Test was used to find the significance in non-parametrica1 continuous variables.

A P-value less than 0.05 was considered as cut-off point for discrimination of significance.

3. Results
One hundred patients with breast lump were enrolled in the study. The mean age of the patients was 19.67+2.9 years. Majority of cases (63%) their age ranged between 15-21 years as described in Figure 1.

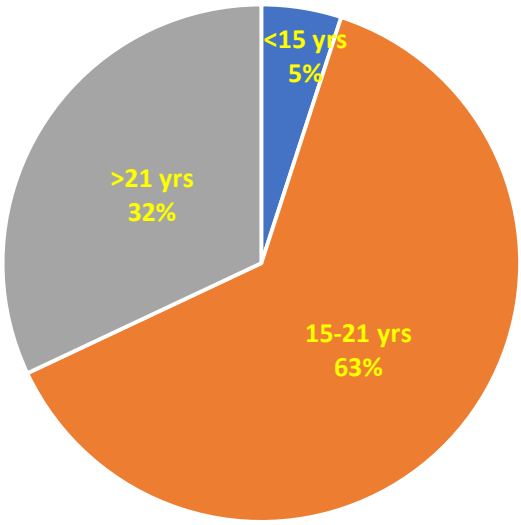

Figure 1: Age group distribution

Regarding the FNA results 79% of cases were fibroadenoma, while both fibroadenosis and fibrocystic diseases were the second most common diagnosis (6% each). Other causes were illustrated in Figure 2.

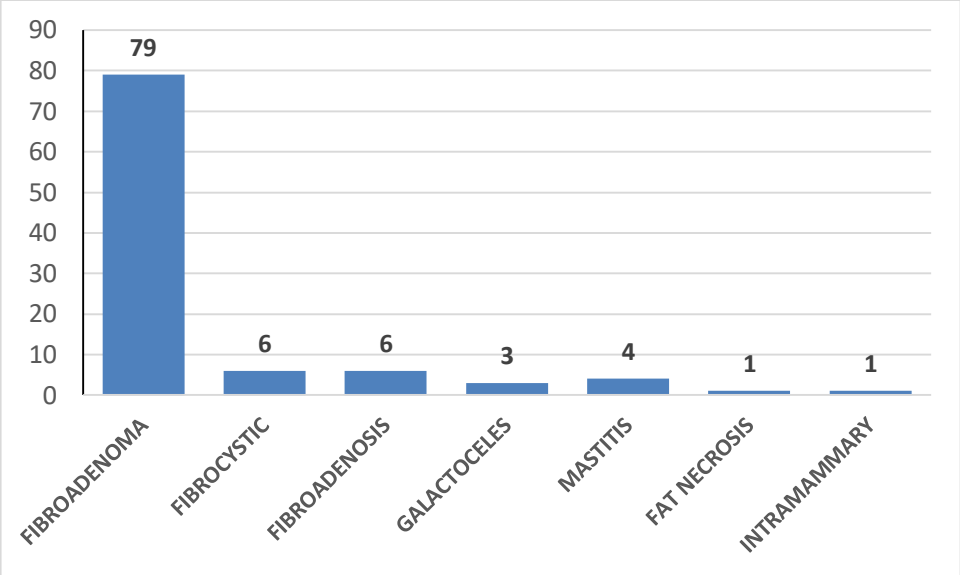

Figure 2: Distribution of FNA results.

The cytological result of the FNA were not different in regard to the age group, BMI level, occupation, educational level, and marital status, these results were further explained in Table 2

Regarding menstrual history patients who were nulliparous, and received hormonal treatment had statistically significant difference in the FNA results, while regularity of the cycle had no such difference. 82.3% of the cases of fibroadenoma were nulliparous and 50% (5 of 10) cases receives hormonal therapy had fibroadenoma. These results further explained in Table 3.

Table 2: Distribution of demographical data.

		Fibroadenoma	Non fibroadenoma	P value
		No. (%)	No. (%)	
Age group	<15	2 (2.5)	3 (14.3)	0.095*
	15-21	52 (65.8)	11 (52.4)	
	>21	25 (31.6)	7 (33.3)	
BMI groups	<18.5	8 (10.1)	1 (4.8)	0.056*
	18.5-24.9	44 (55.7)	8 (38.1)	
	25-29.9	17 (21.5)	11 (52.4)	
	>30	10 (12.7)	1 (4.8)	
Occupation	Student	43 (54.4)	7 (33.3)	0.205*
	Housewife	34 (43)	13 (61.9)	
	Employee	2 (2.5)	1 (4.8)	
Education	Illiterate	2 (2.5)	0	0.664*
	Primary	14 (17.7)	6 (28.6)	
	Secondary	47 (59.5)	13 (61.9)	
	University	15 (19)	2 (9.5)	
	Postgraduate	1 (1.3)	0	

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Marital status	Unmarried	49 (62)	8 (38.1)	0.105*
	Married	29 (36.7)	13 (61.9)	
	Widow	1 (1.3)	0	

' Fisher-Freeman-Halton exact test was used (for the non-dichotomous variables)

Table 3: Effect of menstrual history on the FNA results.

Variables		Fibroadenoma	Non fibroadenoma	P value
		No. (%)	No. (%)	
Regularity	**Regular**	57 (72.2)	12 (57.1)	0.196*
	Irregular	22 (27.8)	9 (42.9)	
Nulliparity	**Yes**	65 (82.3)	9 (42.9)	**0.00***
	No	14 (17.7)	12 (57.1)	
Hormonal	**Yes**	5 (6.3)	5 (23.8)	**0.03***
	No	74 (93.7)	16 (76.2)	
Duration of treatment	**Negative**	74 (93.7)	16 (76.2)	**0.04****
	1 month	3 (3.8)	3 (14.3)	
	4 months	0	1 (4.8)	
	6 months	1 (1.3)	0	
	1 year	1 (1.3)	1 (4.8)	

* Fisher exact test was used.
** Fisher-Freeman-Halton exact test was used (for the non-dichotomous variables)

The age of menarche was not different among the different FNA diagnoses, while gravidity, parity and miscarriage were different, as explained in Table 4.

Table 4: Obstetrical history.

Variables	FNA results	Mean	Range	P value
Menarche	**Fibroadenoma**	l3.27z12.33	(8-16)	0.570
	Fibrocystic	12.33a13.5	(12-14)	
	Fibroadenosis	13.5s12.67	(12-16)	
	Galactoceles	12.67+13.5	(12-14)	
	Mastitis	13.5A13	(13-14)	
	Fat necrosis	l3z l2	(13-13)	
	Intramammary	12+0.29	(12-12)	
Gravidity	**Fibroadenoma**	0.29a l	(0-3)	0.002
	Fibrocystic	1+0.83	(0-3)	
	Fibroadenosis	0.83A2	(0-4)	
	Galactoceles	2+1.75	(0-5)	
	Mastitis	1.75A0	(1-4)	
	Fat necrosis	1	(1-1)	
	Intramammary	lz0.22	(1-1)	
Para	**Fibroadenoma**	0.22zl	(0-2)	<0.001
	Fibrocystic	lz0.17	(0-3)	
	Fibroadenosis	1	(1-1)	

	Galactoceles	2A1.5	(0-5)	
	Mastitis	l.5z0	(1-3)	
	Fat necrosis	1	(i i)	
	Intramammary	l	(l- l)	
Miscarriage	**Fibroadenoma**	0.05+0	(0-2)	
	Fibrocystic	0+0.67	(0-0)	
	Fibroadenosis	0.67+0	(0-3)	
	Galactoceles	0	(0-0)	0.023
	Mastitis	0.25+0	(0-1)	
	Fat necrosis	0	(0-0)	
	Intramammary	0	(0-0)	

The FNA results were not different in regards to past medical and surgical histories, family history of breast lump or cancer, and history of smoking. While history of lactation was different among the different types of FNA results, as mastitis was solely found in lactating women, these results further explained in Table 5

The FNA results were significantly different depending on BIRAD system. Cases of fibroadenoma BIRAD category were either 3 or 4. While cases of intramammary lymph nodes 100% were category 4b.

Table 5: Assessment of risk factors.

Variables		**Fibroadenoma**	**Non fibroadenoma**	**P value**
		No. (%)	**No. (%)**	
Side	**RT**	34 (43.0)	8 (38.1)	0.82**
	Left	37 (46.8)	10 (47.6)	
	Bilateral	8 (10.1)	3 (14.3)	
PSH	**Positive**	6 (7.6)	0	0.233*
	Negative	73 (92.4)	21 (100.0)	
PMH	**Positive**	2 (2.5)	1 (4.8)	0.511*
	Negative	77 (97.5)	20 (95.2)	
Family history of CA	**Positive**	11 (13.9)	0	0.115*
	Negative	69 (86.1)	21 (100.0)	
Relatives	**Negative**	68 (86.1)	21 (100.0)	0.233**
	1st degree	1 (1.3)	0	
	2nd degree	10 (12.7)	0	
Smoking	**Non smoker**	62 (78.5)	19 (90.5)	0.565**
	Passive smoker	14 (17.7)	2 (9.5)	
	Smoker	3 (3.8)	0	
lactation	**Negative**	69 (87.3)	11 (52.4)	**0.001****
	Positive	10 (12.7)	8 (38.1)	
	6 months	0 (.0)	1 (4.8)	
	18 months	0 (.0)	1 (4.8)	

” Fisher exact test was used.

** Fisher-Freeman-Halton exact test was used (for the non-dichotomous variables)

Table 6: Distribution of FNA results according to BIRAD system.

FNA result	**BIRAD results**				
	1	**2**	**3**	**4a**	**4b**
Fibroadenoma	0 (.0)	0 (.0)	50 (63.3)	5 (6.3)	24 (30.4)
Fibrocystic	0 (.0)	6 (100.0)	0 (.0)	0 (.0)	0 (.0)
Fibroadenosis	4 (66.7)	0 (.0)	1 (16.7)	1 (16.7)	0 (.0)
Galactoceles	0 (.0)	1 (33.3)	0 (.0)	0 (.0)	2 (66.7)
Mastitis	0 (.0)	0 (.0)	4 (100.0)	0 (.0)	0 (.0)

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Fat necrosis	0 (.0)	0 (.0)	0 (.0)	0 (.0)	1 (100.0)
Intramammary	0 (.0)	0 (.0)	0 (.0)	0 (.0)	1 (100.0)

4. Discussion

As fibroadenoma found in 10% of all women according to the Autopsy studies, it is regarded the most common cause of breast mass in adolescent and early adulthood life [11].

In the current study the rate of fibroadenoma was 79% and 65.8% of them were in age range 15-21 years. The differences in the age had different preference for the FNA results, as galactocele and intramammary lymph node were higher in age more than 21 years while fibroadenosis and mastitis were in age ranged from 15-21 years. As [2] stated that fibroadenoma was the most common diagnosis in age ranged from 15 to 35 years. [12] also found that fibroadenomas were common in age 21- 30 years these trivial differences in the age were attributed to the age group included in these different studies, nevertheless all concluded that fibroadenoma was the most common mass in adolescent and young adults.

Regarding body mass index, no statistical difference was found. Similarly, [13] in their study that included large sample size (n=6899) and followed for seven found that females with thinner girls were more prone to benign breast disorders than thicker girls.

[14] in their study (n=300) found that significant association between fibroadenoma and increased BMI, and suggested that higher BMI is associated with increase. these variations may have attributed to the different sampling technic adopted by these studies, as in the current study only 11 cases were obese and this may place potential for type II error. While [13], included large sample size but did not provide separated analysis for the diagnosis of the breast mass, that may associated with in-group differences not illustrated in their study. [14] specifically studied BMI effect on the diagnosis of fibroadenoma and other benign breast disorders.

According to the occupation and educational level, no difference in the diagnosis was found. These results were found contrary to the results found by [15] who state that occupational stress were associated with increased rate of benign breast disorders, this difference may attributed to the inclusion of only 2 employee in the current study. On other hand, [16] found that patients with educational level of university were had higher rate of fibroadenoma than those without university degree, these differences also attributed to the large data set included in their study (n=58 322) making these differences quite obvious.

Marital status had no difference on the diagnosis of breast mass. On contrary, [17] found that early marriage had no effect on other hand unmarried women were more likely to have fibroadenoma than married women.

these differences due to the different sample collection which included cases of fibroadenoma and a control group that includes healthy females, this result on other prospective may give similarity to the current study as majority of cases of fibroadenoma (65%) was unmarried in this study.

Nulliparity (together with gravidity, parity and miscarriage) were associated with high rate of fibroadenoma, similar result found by [17], [18].

Similarly, patient receiving hormonal therapy exposed to higher dose of estrogen and found to have higher rate of fibroadenoma (ten cases received hormonal therapy 5 cases of them had fibroadenoma), similar result found by [19], while [20], found that majority of cases of fibroadenoma was estrogen receptor

positive on histopathology, this result gives an idea on pathogenesis of fibroadenoma.

The side of the breast mass, past surgical history, past medical history, smoking all were not different in regard to the diagnosis of breast mass.

Although, both family history and 1st and 2nd degree relatives with benign breast disease were not significant different in regard to the diagnosis of breast mass; all cases of positive family history of fibroadenoma had the similar diagnosis in both 1st and 2nd degree relatives. These results were similar to the results found by [16]. Cases of mastitis, galactocele were commonly occurred in lactating women.

5. Conclusion

- Most common cause of benign breast mass is fibroadenoma.
- Fibroadenoma was more common in age group ranged from 15-21 years, cases of nulliparity, positive family history and hormonal treatment.

6. References

[1] Salamat F, Niakan B, Keshtkar A, Rafiei E, Zendehdel M. Subtypes of benign breast disease as a risk factor of breast cancer: A systematic review and meta analyses. Iranian journal of medical sciences. 2018;43(4):355.

[2] Fekih-Romdhane F, Saadallah F, Mbarek M, Bouzaiene H, Cheour M. Prevalence and correlates of hopelessness in Tunisian women with benign breast disease and breast cancer. Journal of Psychosocial Oncology. 2021:1-18.

[3] Stachs A, Stubert J, Reimer T, Hartmann S. Benign breast disease in women. Deutsches Ärzteblatt International. 2019;116(33-34):565.

[4] Slepicka PF, Somasundara AVH, Dos Santos CO, editors. The molecular basis of mammary gland development and epithelial differentiation2021: Elsevier.

[5] Lopez ME, Olutoye OO. Breast embryology, anatomy, and physiology. Endocrine Surgery in Children: Springer; 2018. p. 365-76.

[6] Wang C, Luan J, Cheng H, Chen L, Li Z, Panayi AC, et al. Menstrual cycle-related fluctuations in breast volume measured using three-dimensional imaging: implications for volumetric evaluation in breast augmentation. Aesthetic plastic surgery. 2019;43(1):1-6.

[7] Memon A, Parveen S, Sangrarasi AK, Malik AM, Laghari A, Talpur KAH. Changing pattern of benign breast lumps in young females. World J Med Sci. 2007;2(1):21-4.

[8] Javed A, Jenkins SM, Labow B, Boughey JC, Lemaine V, Neal L, et al. Intermediate and long-term outcomes of fibroadenoma excision in adolescent and young adult patients. The breast journal. 2019;25(1):91-5.

[9] Pillay S, Cheddie S, Moodley Y. Fibroadenoma of the breast in a South African population-a pilot study of the diagnostic accuracy of fine needle aspirate cytology and breast ultrasonography. Afr Health Sci. 2018;18(2):273-80.

ISSN: 0005-2523
Volume 62, Issue 06, August, 2022

[10] Mendelson EB, Berg WA, Merritt CRB, editors. Toward a standardized breast ultrasound lexicon, BI-RADS: ultrasound2001: Elsevier.

[11] Sasaki J, Geletzke A, Kass RB, Klimberg VS, Copeland Iii EM, Bland KI. Etiology and management of benign breast disease. The Breast: Elsevier; 2018. p. 79-92.

[12] Tummidi S, Kothari K, Agnihotri M, Naik L, Sood P. Fibroadenoma versus phyllodes tumor: a vexing problem revisited! BMC cancer. 2020;20(1):1-12.

[13] Berkey CS, Willett WC, Frazier AL, Rosner B, Tamimi RM, Colditz GA. Prospective study of growth and development in older girls and risk of benign breast disease in young women. Cancer. 2011;117(8):1612-20.

[14] Bhettani MK, Rehman M, Altaf HN, Ahmed SM, Tahir AA, Khan MS, et al. Correlation between body mass index and fibroadenoma. Cureus. 2019;11(7).

[15] Han X, Li Q, Wang C, Li Y. The association of occupational stress and depressive symptoms among employed persons with benign breast disease: the mediating role of psychological capital. Psychopathology. 2019;52(3):205-11.

[16] Li J, Humphreys K, Ho PJ, Eriksson M, Darai-Ramqvist E, Lindström LS, et al. Family history, reproductive, and lifestyle risk factors for fibroadenoma and breast cancer. JNCI Cancer Spectrum. 2018;2(3):pky051.

[17] Akhtar MS, Saif AB, Zafar H, Mushtaq A, Hashmi T, Tariq M. ASSOCIATION OF MARITAL STATUS, EARLY MARRIAGE AND PARITY WITH FIBROADENOMA. PAFMJ. 2021;71(1):73-8.

[18] Kumar N, Prasad J. Epidemiology of benign breast lumps, is it changing: a prospective study. International Surgery Journal. 2019;6(2):465-9.

[19] Balakrishnan A, Yang J, Beattie CW, Gupta TKD, Nandi S. Estrogen receptor in dissociated and cultured human breast fibroadenoma epithelial cells. Cancer letters. 1987;34(3):233-42.

[20] Rekha A, Chander V, Ravichandran A. Hormone Receptor Expression in Non Cancer Breast Lesions. International Journal of Case Reports. 2020;4:180-.