Fibrocystic Disease And Duct Ectasia Of The Breast; Similarities And Differences

Zainab Mohammed Salih [1]

[1]General Surgeon, University of Duhok College of Medicine, Duhok, Kurdistan Region Iraq

*Corresponding Author:

Dr. Zainab Mohammed Salih Taha

Email ID: zainab.salih@uod.ac

ABSTRACT

Introduction: The breast is a dynamic organ that undergoes many physiological changes during the female's life. Fibrocystic breast disease is characterized by a group of proliferative cell elements while in mammary duct ectasia there is abnormal dilatation of the mammary ducts.

Patients and methods: This retrospective study included 116 female patients divided into two groups, the first group were patients with fibrocystic disease and the second having duct ectasia. Both groups were compared for clinical differences and similarities.

Result: The mean age patients was 33.63 years with a mean BMI of 27.99 with no significant differences between both groups regarding both parameters (P values 0.09 & 0.238). Caffeine, alcohol consumption, smoking, and family history of breast cancer also showed no significant correlation (P values 0.618, 1.00, 0.438, and 1.00). Pain was present in 81% of fibrocystic disease and 75.9% of duct ectasia patients. The pain was non-cyclical in most patients of both groups, cyclical pain was commoner in fibrocystic disease than duct ectasia (34.5% vs. 27.6%). All the correlations with pain were not significant regarding the presence or absence of pain, its location regarding breast quadrants, and whether cyclical or not (P values 0.652, 0.535, and 0.547) respectively.

Breast tenderness was commoner in fibrocystic disease (77.6%) compared to duct ectasia (65.5%) but the correlation was not significant (P value 0.217). Nipple discharge and retraction was present in 44% and 10.6% of patient with duct ectasia respectively and were absent in patient with fibrocystic disease with a very significant between both groups both clinical findings (P values 0.000 and 0.027) respectively.

Breast nodularity was detected in 5.2% of duct ectasia patients and 27.6% of fibrocystic disease patients. Breast lump was more predominant in fibrocystic disease compared to duct ectasia patients (22.4% vs.1.7%) with a very significant difference between both groups (P values 0.002 & 0.001) respectively.

Conclusion: Benign breast disorders are common in females, fibrocystic disease and duct ectasia are among the commonest ones. Breast pain and tenderness are common in both diseases, nipple discharge and retraction are more predominant features of duct ectasia while nodularity and lump are more predominant in fibrocystic disease.

1. INTRODUCTION

The breast is a dynamic organ that undergoes many physiological changes during the female's life. There are many hormonal changes which occur also during the reproductive life. Both duct ectasia and fibrocystic diseases are among the commonest benign disorders affecting many females. [1]

Fibrocystic breast diseases or called fibrocystic breast disorder characterized by a group of proliferative cell elements which may be associated with atypical cellular features in some patients. Some factors have been linked to the development of fibrocystic diseases like high social class, late age of menopause, estrogen replacement hormonal therapy, nulliparity, and dietary factors. Early age at menarche has not been linked to the development of fibrocystic disease. [2, 3]

The normal diameter of the mammary ducts is between 0.5 – 1 mm in diameter. Mammary duct ectasia is defined as an abnormal dilatation of the mammary ducts, it is considered to be dilated when its diameter exceed 1 mm. [4]

The pathophysiology of duct ectasia is still not well understood, but numerous factors have been studied to participate in its causation such as obstruction of the lactiferous duct which result in duct rupture, this is usually followed by secondary bacterial infection and abscess formation. Smoking is another major risk factor for the development of duct ectasia, it is postulated that smoking cause direct or indirect damage to the subareolar ducts resulting in necrosis and infection, the breast also has the ability to concentrate some substances which present in tobacco such as cotinine which is a nicotine derivative that causes injury to the duct mucosa and chemical inflammation, this may be followed by secondary bacterial infection. The concentration of cotinine in the breast have been shown to be more than that of plasma. [5]

The clinical presentation of duct ectasia include breast pain, mastalgia, subareolar masses, peri-areolar abscesses, and mammary fistula. Duct ectasia may cause distortion of the nipple with nipple retraction when chronic inflammation is established. [5-7]

Mammography may shows micro calcifications or smooth speculated masses, sometimes the mammographic features of mammary duct ectasia may be indistinguishable from cancer which mandates further assessment. [7, 8]

The management of duct ectasia may include cessation of smoking, empirical antibiotic therapy, fistulectomy and saucerization which may achieve long term relief of symptoms. Recurrent disease require antibiotic administration on the bases of culture and sensitivity, wide surgical excision of the affected ducts is sometimes required. [5, 6]

2. PATIENTS AND METHODS

This retrospective study included ,All cases from single private clinic,patients on regular follow up,we try to collect information of 116 female patients within a period of 2 years. A detailed questionnaire containing some details of the patient's information, different symptoms, and signs during breast examination, patients after that were sent for imaging mainly ultrasound study, on the basis of the clinical diagnosis patients were grouped into two matched groups, the first group are those having fibrocystic disease and the second to those having duct ectasia. The two groups were compared regarding different clinical and patients life style characteristics in order to detect the most common characteristics for each group. Patients who were diagnosed with breast pathologies other than fibrocystic disease and duct ectasia, those with incomplete data, male patients, or those who refused to be included in this study were excluded.

3. AIM OF THE STUDY

The aim of this study is to find the clinical differences and similarities between fibrocystic disease and duct ectasia, and to find the most common clinical signs for each of them.

4. STATISTICAL ANALYSES

The descriptive part of the analyses is done in the form of frequencies and percentages for the numerical variables, and mean and standard deviations for the categorical ones. The 2 groups were then compared using the Pearson Chi square test and the Fischer's Exact test for the categorical variables and the independent t test for the numerical ones.

The analyses were done using the Statistical Package for Social Sciences (SPSS; IBM) version 25, P values equal or less than 0.05 were considered significant.

5. RESULTS

The mean age of our patients is 33.63 years, the mean BMI of them is 27.99, and most patients had regular menses and had history of lactation. Most patients had no history of smoking and alcohol consumption. Table 1.

Table 1: The different charecteristics of the patients involved in the study.

Category	Subcategories	frequency	percentage
AGE (M;SD) Range: 15-52		33.63	8.927
BMI (M;SD) Range: 18-41		27.99	4.465
Menarche (M;SD) Range: 10-16		12.41	.969
Menstrual status	Menstruating	106	91.4
	Menopausal	10	8.6

Menstrual cycles	Regular	93	80.2
	Irregular	23	19.8
Marital status	Married	97	83.6
	Single	19	16.4
Age at 1st pregnancy (M;SD) **Range: 13-30**		21.29	3.217
Number of children (M;SD) **Range: 0-14**		2.84	2.613
Lactation status	Lactating	7	6.0
	Non-lactating	23	19.8
	History of lactation	86	74.1
Smoking status	Smoker	7	6.0
	Non-smoker	109	94.0
Alcohol consumption	Alcoholic	3	2.6
	Non-alcoholic	113	97.4
Coffee consumption	Yes	4	3.4
	No	112	96.6
Intake of OCCP	Yes	2	1.7
	No	114	98.3
Family history of breast diseases	Yes	1	0.9
	No	115	99.1

Pain was the most predominant symptom which was non-cyclical in most of them, other symptoms included nodularity, nipple discharge, nipple retraction, and breast lump. Table 2.

Table 2: The main points discovered during the history and the clinical breast examination.

Category	Subcategories	Frequency	Percentage
Pain	Present	91	78.4
	Absent	25	21.6
Site of pain	Right breast	43	37.1
	Left breast	58	50.0
	Bilateral	15	12.9
Location of pain	Whole breast	71	61.2
	Upper inner quadrant	8	6.9
	Upper outer quadrant	27	23.3
	Lower outer quadrant	4	3.4
	Lower inner quadrant	1	.9
	Subareolar	5	4.3
Type of pain	Cyclical	36	31.0
	Non-cyclical	80	69.0

Nodularity	Present	19	16.4
	Absent	97	83.6
Breast tenderness	Present	83	71.6
	Absent	33	28.4
Breast lump	Present	14	12.1
	Absent	102	87.9
Nipple discharge	Yes	26	22.4
	No	90	77.6
Color of discharge	Greenish	4	3.4
	Pus	16	13.8
	No discharge	96	82.8
Ducts	Multiple ducts	26	22.4
	No discharge	90	77.6
Nipple retraction	Present	6	5.2
	Absent	110	94.8
Type of retraction	Slit like	4	3.4
	Circumferential	2	1.7
	No retraction	110	94.8
Breast redness	Present	2	1.7
	Absent	114	98.3

Ultrasound and mammography were the most common imaging modality which was used. MRI was used for selected cases. Figure 1.

Figure 1: A simple pie chart showing the different imaging modalities used for the diagnosis.
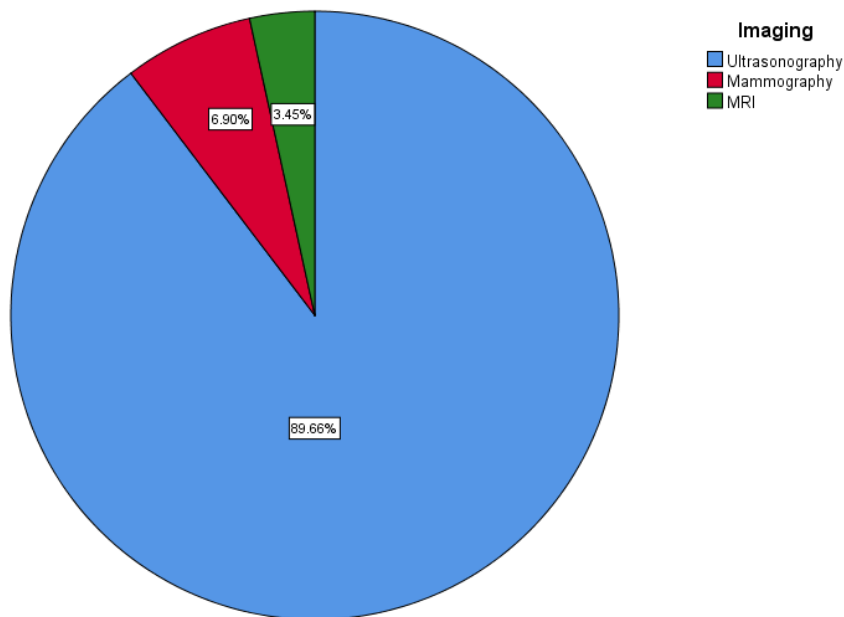
Correlations were done between each of duct ectasia and fibrocystic disease and patients general characteristics, there was significant difference between both diseases regarding the general patient characteristics. Table 3 & 4.

Table 3: The correlation between different patient's numerical variables with both fibrocystic disease and duct ectasia using the independent t test.

Category	Std. Error Difference	Mean difference	Breast disorder		Sig. (2-tailed)
			Lower	Upper	
Age	1.644	-2.810	-6.067	0.447	0.090
BMI	0.828	-0.983	-2.622	0.657	0.238
Menarche	0.181	0.086	-0.271	0.444	0.634
Age at 1st pregnancy	0.597	0.586	-0.597	1.770	0.329
Number of children	0.487	-0.276	-1.240	0.688	0.572

Table 4: The correlation between diffirent patients chrecteristics (Categorial variable) with both fibrocystic disease and duct ectasia, the Pearson Chi square test and Fischer's Exact tests are used to detect this correlation.

Category	Subcategories	Disease category h jmyt6g		Sig. (2-sided)
		Duct ectasia	Fibrocystic disease	
Menstrual status	Menstruating	51(87.9%)	55(94.8%)	
	Menopausal	7(12.1%)	3(5.2%)	0.322*
Menstrual cycles	Regular	49(84.5%)	44(75.9%)	0.352*
	Irregular	9(15.5%)	14(24.1%)	
Marital status	Married	52(89.7%)	45(77.6%)	0.131*
	Single	6(10.3%)	13(22.4%)	
Lactation status	Lactating	4(6.9%)	3(5.2%)	
	Non-lactating	7(12.1%)	16(27.6%)	0.127**
	History of lactation	47(81.0%)	39(67.2%)	
Smoking status	Smoker	2(3.4%)	5(8.6%)	0.438**
	Non-smoker	56(96.6%)	53(91.4%)	
Alcohol consumption	Alcoholic	1(1.7%)	2(3.4%)	1.00**
	Non-alcoholic	57(98.3%)	56(96.6%)	
Coffee consumption	Yes	1(1.7%)	3(5.2%)	0.618**
	No	57(98.3%)	55(94.8%)	
Intake of OCCP	Yes	1(1.7%)	1(1.7%)	1.00**
	No	57(98.3%)	57(98.3%)	
Family history of breast diseases	Yes	1(1.7%)	0(0.0%)	1.00**
	No	57(98.3%)	58(100.0%)	

* Pearson Chi-Square test, ** Fisher's Exact test.

The findings on clinical examination for each group were documented and the correlations were studies to detect any difference between both groups. Breast nodularity, breast lump, nipple discharge, and nipple retraction showed significant correlations. Table 4.

Table 5: The correlation between different patient's characteristics (categorical variables), the symptoms and the clinical signs are correlated to both fibrocystic disease and duct ectasia, the Pearson Chi square test and Fischer's Exact tests are used to detect this correlation.

Category	Subcategories	Breast disorder		Sig. (2-sided)
		Duct ectasia	Fibrocystic disease	
Pain	Present	44(75.9%)	47(81.0%)	
	Absent	14(24.1%)	11(19.0%)	0.652*
Site of pain	Right breast	17(29.3%)	26(44.8%)	
	Left breast	34(58.6%)	24(41.4%)	0.186*
	Bilateral	7(12.1%)	8(13.8%)	
Location of pain	Whole breast	34(58.6%)	37(63.8%)	
	Upper inner quadrant	6(10.3%)	2(3.4%)	
	Upper outer quadrant	13(22.4%)	14(24.1%)	0.535**
	Lower outer quadrant	1(1.7%)	3(5.2%)	
	Lower inner quadrant	1(1.7%)	0(0.0%)	
	Subareolar	3(5.2%)	2(3.4%)	
Type of pain	Cyclical	16(27.6%)	20(34.5%)	
	Non-cyclical	42(72.4%)	38(65.5%)	0.547*
Nodularity	Present	3(5.2%)	16(27.6%)	
	Absent	55(94.8%)	42(72.4%)	0.002**
Breast tenderness	Present	38(65.5%)	45(77.6%)	
	Absent	20(34.5%)	13(22.4%)	0.217*
Breast lump	Present	1(1.7%)	13(22.4%)	
	Absent	57(98.3%)	45(77.6%)	0.001*
Nipple discharge	Yes	26(44.8%)	0(0.0%)	
	No	32(55.2%)	58(100.0%)	0.000*
Nipple retraction	Present	6(10.3%)	0(0.0%)	
	Absent	52(89.7%)	58(100.0%)	0.027**
Breast redness	Present	2(3.4%)	0(0.0%)	
	Absent	56(96.6%)	58(100.0%)	0.496*

* Pearson Chi-Square test, ** Fisher's Exact test.

6. DISCUSSION

It has been estimated some studies that the incidence of mammary duct ectasia may reach up to 20% in. Both diseases can occur at any age group, in our study the mean age of the patients was 33.63 years and we didn't detect any significant differences between them regarding the age groups (P value 0.09). [4]

Most patients who were involved on our study were overweight with a mean BMI of 27.99, the BMI was not a significant factor of difference between both mammary duct ectasia and fibrocystic disease (P value 0.238). Caffeine consumption was reported in 3.4% of the involved patients in this study and alcohol consumption in 2.6%, and both factors showed no significant correlation with the development both diseases (P values 0.618 & 1.00) respectively. Studies showed a correlation between coffee consumption and the development of mastalgia while fibrocystic disease and duct ectasia showed no any significant correlations supporting the findings in our study. [9, 10]

Smoking has been implicated to be one of the important causes of duct ectasia while it is association with fibrocystic disease

is not still well established, in our study we found that there was no any significant difference between both diseases regarding the smoking status (P value 0.438). Alcohol consumption is not correlated to both disease in most studies, in our study the results was similar to the published data (P value 1). [4, 11]

Most of the involved patients were married, and had history of pregnancy or pregnancies, both marital status, pregnancies, and number of children were not associated with the development of either disease (P values 0.131, 0.329, and 0.572) respectively. Family history of breast diseases including cancer showed no significant correlation with the development of either fibrocystic disease or duct ectasia (P value 1.00). Some authors suggested a possible correlation between breast cancer and fibrocystic disease, although this is not well established and still is matter of great debate. [12]

Pain was present in the majority of patients with both fibrocystic disease (81%) and duct ectasia (75.9%), and in most patients of both groups the pain was more generalized pain than confined to one breast quadrant. The pain was non-cyclical one in most patients of both groups, the cyclical pain was slightly commoner in patients with fibrocystic disease than those with duct ectasia (34.5% vs. 27.6%) respectively. All the correlations with pain were not significant including the presence or absence of pain, the location of pain in relation to breast quadrants, and the type of pain whether cyclical or not (P values 0.652, 0.535, and 0.547) respectively. The presence of breast tenderness was commoner in patients with fibrocystic disease (77.6%) compared to duct ectasia (65.5%) but the correlation was not significant (P value 0.217). Mastalgia is a very common symptom and usually present in a wide variety of benign breast diseases, it is not specific to certain disease category and it may rarely be seen in patients with cancer of the breast or even may be referred pain from the neck. [10, 13]

Nipple discharge was present in 44% of patient with duct ectasia and no patient with fibrocystic disease complained from nipple discharge in our study, and nipple retraction was present in only 10.6% of the duct ectasia group while no patient of fibrocystic disease had nipple retraction. The difference was very significant between both groups regarding these two clinical findings (P values 0.000 and 0.027) respectively. Bloody nipple discharge especially from a single duct and the presence of recent circumferential retraction is found to be more significant and may indicate a serious underlying pathology. [14]

Breast nodularity can be detected during breast physical examination as lumpiness which may very before and after the menstrual cycles, nodularity was a predominant feature of patients with fibrocystic disease which was detected in 27.6% of them while 5.2% patients with duct ectasia had breast nodularity. The presence of breast lump was also more predominant in fibrocystic disease patients comparing to those with duct ectasia (22.4% vs. 1.7%). There was a very significant difference in regard to the presence of nodularity and lump during breast examination (P values 0.002 & 0.001) respectively. Breast redness was more prevalent in patients with duct ectasia than those with fibrocystic disease (2% vs. 0%), and the correlation between them was didn't show any statistical significance (P value 0.496). Studies documented that the presence of breast lump is commoner in those with fibrocystic disease, the lump can vary in size and can mimic cancer and need imaging and histopathological evaluation to reach the final diagnosis. [15-18]

Conflicts of interest: there is no conflict of interest to be declared.

REFERENCES

[1] Malherbe, K. and S. Fatima, *Fibrocystic Breast Disease.* 2019.

[2] Wu, C., et al., *A case-control study of risk factors for fibrocystic breast conditions: Shanghai Nutrition and Breast Disease Study, China, 1995–2000.* American journal of epidemiology, 2004. 160(10): p. 945-960.

[3] Naveen, N., A. Mukherjee, and V. Mahajan, *A clinical study of benign breast disease in rural population.* Journal of Evolution of Medical and Dental Sciences, 2013. 2(30): p. 5499-5512.

[4] Rahal, R.M.S., R. De Freitas-Júnior, and R.R. Paulinelli, *Risk factors for duct ectasia.* The breast journal, 2005. 11(4): p. 262-265.

[5] Zhang, Y., et al., *Clinical characteristics, classification and surgical treatment of periductal mastitis.* Journal of thoracic disease, 2018. 10(4): p. 2420.

[6] Beechey-Newman, N., et al., *Treatment of mammary duct fistula by fistulectomy and saucerization.* World journal of surgery, 2006. 30(1): p. 63-68.

[7] Sweeney, D. and E. Wylie, *Mammographic appearances of mammary duct ectasia that mimic carcinoma in a screening programme.* Australasian radiology, 1995. 39(1): p. 18-23.