

CLINICAL EVALUATION OF MAMMARY DUCTAL ECTASIA IN MOSUL CITY; A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Ductectasia is an abnormal enlargement of the central milk duct associated with chronic inflammation and fibrosis. This is a common clinical condition that may affect a single breast or both breasts. **Aim of the study:** To evaluate the clinical evaluation of mammary duct ectasia in women of Mosul city. **Patients and Methods:** This study investigated milk duct dilation clinical situation at Al-Jumhori and Al-Khansaa Teaching Hospitals. Researchers interviewed 250 women with ductal ectasia using simple sampling techniques. Data collection, analysis, and generation took six months, using patient interviews and checklist questionnaires. **Results:** The study found that the most common age group was 40-49, with a higher education level being the most common. Housewives were the most common, with married women comprising 93.2%. Sonography was the most common method used. The mean weight was 76.90 ± 12.494 Kg, and the mean height was 159.73 ± 6.065 Cm. The mean BMI was 30.23 ± 5.251 . The majority of women had a regular menstrual cycle, with lactating women (8.4%) and a history of lactation (87.2%). Smoking was 9.2% of the sample, and only 0.4% had a history of breast trauma. The most common presenting features were pain (71.2%), nodules (2.8%), tenderness (63.6%), and discharge (58.0%). **Conclusions:** Ductal dilation is a common symptom in overweight women, especially those with a history of breastfeeding. It is not related to menstrual regularity, but pain, tenderness, and nodule formation are strong indicators. A breast ultrasound is the most predictable test.

KEYWORDS: Breast mass, Clinical evaluation, Ductal Ectasia.

INTRODUCTION

Mammary duct ectasia (MDE) is an inflammatory disease affecting the nipple and areola complex, causing abnormally dilated and tortuous lactiferous ducts. It results from endoluminal changes and loss of elastin in the duct wall. MDE patients experience discomfort, tenderness, and periods of nipple discharge.^[1] The prevalence ranges from 5.5% to 25%, with more common in females aged 30 to 70 years. Symptoms include enlargement of ducts, excess secretion buildup, obstructive cells, changes in cellular makeup, inflammation, and periductal sclerosis. MDE is common in married, overweight, or obese females with a history of lactation and may be influenced by coffee consumption.^[2, 3]

Mammary duct ectasia and periductal mastitis (PDM) are not joint ailments but can be caused by enlargement and twisting of the affected duct, accumulation of crumbly

residue, and fat-filled macrophages. MDE lacks cell multiplication around the duct aperture, while PDM has an intact epithelial lining but squamous metaplasia.^[4, 5] MDE patients show dilated ducts with accumulated secretions and blood, reduced elastin, and inflammatory infiltrates. Nipple discharge, primarily affecting women, can cause symptoms like mastalgia and nipple ectasia, which can be bloody and indicate breast cancer or intraductal papilloma. As cases become chronic, juiciness worsens, causing subareolar abscesses, fibrosis, fevers, and affected nipple orientation. Ultrasound is the new standard for evaluating suspected mammary duct ectasia and other ductal diseases, with magnetic resonance technology being a common diagnostic standard. Cytology is a valuable choice for medical professionals when examining unknown nipple discharge sources, involving sporadic and scattered epithelial cells, amorphous substances, rare macrophages, and red blood cells.^[5, 6]

Mammograms are an effective technique for identifying problematic forms of mastitis, such as malignant or uncommon types, due to their heightened sensitivity in detecting microcalcification. The two most commonly used views for screening mammography are the craniocaudal view (CC) and mediolateral oblique (MLO), which allow for differentiation between structures that may appear stacked on one another.^[7] Tomosynthesis imaging, a modern innovation, reduces the superimposition effect in tissues, allowing radiologists to view slices of the breast by scrolling through the imaging. Starting at age 40, women with an average breast cancer risk are recommended to undergo yearly mammogram screenings. There is no age cap for mammography screening, but it is based on the individual's present physical condition. High-risk patients should begin screenings at an earlier age, with a family history of breast cancer starting ten years before the youngest relative's diagnosis.^[8,9] Male patients with gynecomastia should undergo a risk assessment by the age of 30 to determine when to begin screening. Diagnostic mammography and sonographic imaging should be performed on women displaying any signs or symptoms of breast cancer, with some relative contraindications.^[8,10]

Duct ectasia management depends on presentation and disease stage. Patients can alleviate symptoms of discharge and discomfort by using supportive bras, warm compresses, and good hygiene. MDE and periductal mastitis can co-exist, with common bacteria being *Staphylococcus aureus*, *Enterococcus*, anaerobic *Streptococcus*, and *Bacteroides*. Effective oral antibiotics and pain medication are recommended. Microdochectomy may be performed for persistent swelling and symptoms. Routine biopsy is not advisable, and significant mammary duct excision or more invasive operations may be necessary for those with recurrent periductal mastitis.^[11,12]

Aim of the study

To evaluate the clinical aspects of mammary duct ectasia in women in the city of Mosul city.

Patients and Methods

Study Setting: The present study was conducted in Al-Jumhori and AL-Khansaa Teaching Hospitals; Al-Jumhori Hospital is one of oldest hospital in the city located at the right side of Nineveh governorate provide different health services in the surgical field for the attendants from inside and outside the city with 400 beds and 24 hour emergencies services. Al-Khansaa Teaching Hospital is situated on the left side of the governorate and started to provide women at 1990 breast examination unit.

Study Design: To achieve the aim of the present study, a cross-sectional study design was conducted. To examine the clinical aspect of the mammary ductal ectasia, a group of 250 females with mammary ductal collected by

convenience sampling technique and interviewed by the researcher.

The inclusion criteria

Each case should have the following characteristics to be included.

- Females since menarche to 70.
- Have registration file with proved diagnosis.

Exclusion criteria

1. Patients diagnosed with benign breast disease other than ductal dilation.
2. People with breast cancer.
3. Patients with insufficient data.
4. Male patients.

Data Collection Tool

Data were collected through patient responses to checklist questionnaires from 1st January to 31st June 2023 and investigator review of their records during patient interviews. The questionnaire included demographic characteristics such as age, education level, occupation, marital status, parity, age at menarche, last menstrual period, menstrual cycle pattern, and lactation status. Smoking status was also assessed. Regarding risk factors, questionnaires assessed the presence of a history of chest trauma, alcohol consumption, coffee intake, and contraceptive use, as well as the presence of any medical comorbidities associated with the duration of these indicators. Clinical features (pain, nodules, breast tenderness, and nipple discharge) and diagnostic methods (ultrasonography, mammography, and histopathology) were also assessed. In addition, the questionnaire format also includes weight, height measurement and BMI calculation.

Statistical analysis

Data collected during the study were summarized in a Microsoft Excel 2007 spreadsheet. Statistical analysis was performed using the Statistical Package for the Social Sciences (IBM-SPSS 20). Numerical data are presented as means and standard deviations, while categorical data are presented as frequencies and proportions. For categorical data, use the chi-square test. A p-value ≤ 0.05 was considered significant.

Ethical considerations

The concept and aims of the study were explained to all participants and verbal consent was obtained. The collection of data will be kept confidential and would not be published except for the study purpose.

RESULTS

The current study included the sociodemographic characteristics of the study sample are listed in table (1), showing a mean age of (47.12 ± 10.087) years. The most common age group was 40-49 years, accounting for 31.2% of the study sample, with a very high statistical difference ($p=0.000$). High school was the most common at 28.4%, while college was the least common at 5.2%;

the difference was statistically significant (p=0.000). From the perspective of occupation, the research samples are mainly housewives, and there are significant

differences with white-collar workers. Married women represented 93.2% of the sample, and the difference was statistically significant (p=0.000).

Table 1: Socio-demographic characteristics of the study sample.

Socio-demographic characteristics		Mean	SD	
Age in years		47.12	10.087	
Study parameters		Frequency	Percentage	p-value
Age groups/ year	<30	1	0.4	0.000
	30-39	67	26.8	
	40-49	78	31.2	
	50-59	66	26.4	
	60-69	38	15.2	
Educational level	Illiterate	61	24.4	0.000
	Primary	58	23.2	
	Secondary	71	28.4	
	University	47	18.8	
	Higher education	13	5.2	
Occupation	Housewives	149	59.6	0.002
	Employee	101	40.4	
Marital status	Single	12	4.8	0.000
	Married	233	93.2	
	Widow	3	1.2	
	Divorce/separation	2	0.8	

**Chi square for goodness of fit*

Methods of diagnosis was illustrated in figure (1) and showed that sonography was the most frequent and represented 85.2% followed by mammography in 10.8% and histopathology in 4.0%.

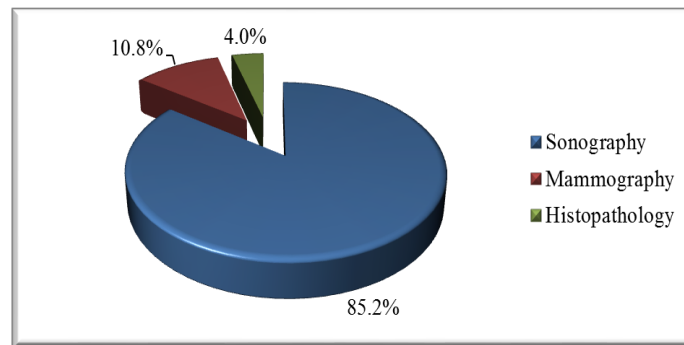


Figure (1): Methods of diagnosis.

The anthropometric results of the study samples are shown in Table (2), showing an average weight of 76.90

± 12.494 kg and an average height of 159.73 ± 6.065 cm. The BMI of the study sample is 30.23±5.251.

Table 2: Anthropometric measurements of the study sample.

Anthropometric measurements	Mean	Standard deviation	
Weight	76.90	12.494	
Height	159.73	6.065	
BMI	30.23	5.251	
BMI classifications	Frequency	Percentage	p-value*
Underweight (<18)	41	16.4	0.003
Normal (18-24.9)	82	32.8	
Overweight (25-29.9)	59	23.6	
Obese (≥30)	68	27.2	
Total	250	100.0	

**Chi square test has been used*

Obstetric characteristics of the study sample was showed in table (3) and showed that the mean parity

(3.21±0.342), the most frequent was para 1-4 representing 69.2%, mean gravidity (4.54±0.958), the

most frequent was <5 gravida that found in 53.6%, and mean abortion (1.43±0.511), the most frequent was <2 abortion in 67.6%. The mean age at menarche was (11.40±1.726) years. The mean age at first pregnancy was (23.41±4.201) years. Most of the women in the

study group had regular menstrual cycle (77.6%). The lactating women represented (8.4%) and the history of lactation found in (78.4%) while non-lactating women represented (13.2%). Regarding the smoking, 9.2% of the study sample was active smokers.

Table 3: Obstetric characteristics of the study sample.

Obstetric characteristics				
Parity(Mean±SD)		3.21±0.342		
		Frequency	Percentage	p-value*
P-0		8	3.2	0.000
P 1-4		173	69.2	
P≥5		69	27.6	
Gravidity(Mean±SD)		4.54		0.958
		Frequency	Percentage	p-value*
G<5		134	53.6	0.282
G≥5		116	46.4	
Abortion(Mean±SD)		1.43		0.511
		Frequency	Percentage	p-value*
<2		169	67.6	0.000
≥2		81	32.4	
Age at Menarche(Mean±SD)		11.40		1.726
Age at 1 st pregnancy(Mean±SD)		23.41		4.201
		Frequency	Percentage	p-value*
Menstrual cycles	Regular	194	77.6	0.000
	Irregular	56	22.4	
Lactation status	Lactating	21	8.4	0.000
	Non-lactating	33	13.2	
	History of lactation	196	78.4	
Smoking status	Smoker	23	9.2	0.000
	Non-smoker	216	86.4	
	Ex-smoker	11	4.4	

*Chi square test has been used

The risk factors of the research samples are listed in Table (4), showing that 4.4% had a history of chest trauma, only 0.4% drank alcohol, 7.6% drank coffee, and

only 2.0% of the research samples took contraceptive pills. 15.6% had comorbidities.

Table 4: Risk factors of the study sample.

Risk factors		Frequency	Percentage	Duration of risk factor (Mean±SD)	p-value *
History of breast trauma	Yes	11	4.4	1.34±0.474	0.000
	No	239	95.6		
Alcohol consumption	Yes	1	0.4	2.47±0.744	0.000
	No	249	99.6		
Coffee consumption	Yes	19	7.6	5.76±0.769	0.000
	No	231	92.4		
Consumption contraceptive pills	Yes	5	2.0	6.23±0.567	0.000
	No	245	98.0		
Medical co-morbidities	Yes	39	15.6	8.97±1.12	0.000
	No	211	84.4		

*Chi square test has been used

The clinical characteristics of the study sample are shown in Table (5), showing that pain was the main feature in 71.2%, nodules accounted for only 2.8%, tenderness accounted for 63.6%, and tenderness accounted for 58.0% of the discharge.

Table (5): Clinical features of the study sample.

Clinical features		Frequency	Percentage	p-value
Pain	Yes	178	71.2	0.000
	No	72	28.8	
Nodule	Yes	7	2.8	0.000
	No	243	97.2	
Breast tenderness	Yes	159	63.6	0.000
	No	91	36.4	
Nipple discharge	Yes	145	58.0	0.011
	No	105	42.0	

DISCUSSION

Ductectasia is a common benign breast condition that we encounter every day in our breast clinic. It affects women of all ages. The study found that the average age was over 47 years old. Similar results were also reported by Moon *et al.*^[13] reported a study in which ductal dilation was most common in perimenopausal women (around 45 to 55 years of age), but may also occur after menopause. In addition, Barsoum^[4] reported that the median age was approximately 47 years (patient age range was 21 to 73 years). While Muhammad's 2021 study^[3] found that the most benign forms of breast disease were more common at a younger age, especially in the second and third decades of life, the average age of patients in the current study was 35.81 years.

Compared with higher education, the proportion of secondary education is the highest, and most of them are housewives. Up to the knowledge, no comparable studies were found examining the relationship between education level or employment and the occurrence of ductal dilatation.

Regarding marital status, the current study found that married women were significantly associated with ductal dilatation, and most women had a history of breastfeeding. In the Mohammed, 2021^[3] study, marital status showed a strong correlation (p-value 0.026). In addition, there was a strong association with lactation (P-value 0.016). A Liu study found that pregnancy and lactation are associated with dilated milk ducts and increased risk of congestion and infection.^[14]

The anthropometric results of the study sample were evaluated in this study; the BMI of the study sample was 30.23 ± 5.251 . The study by Schafer *et al.*^[15] concluded that obesity is considered an important risk factor for ductal dilatation, although this conclusion is based on case reports and lacks epidemiological evidence. Richard's study^[16] also found a positive association between obesity and ductal dilatation.

Most of the women in this study were prolific women with moderate parity (3.21 ± 0.342) and moderate pregnancy (4.54 ± 0.958). This is consistent with the findings of Ramalingam *et al.*^[11] among them; all patients except one nulliparous woman gave birth. In the study of Mohammed (2021)^[3] patient parity was not

positively correlated with the development of mammary ductal dilation (P-value 0.470), and some other similar articles demonstrated similar results.^[17]

Women in the current study sample were found to have menarche earlier, with an average age of about 11 years. In contrast, the study by Liu *et al.*^[14] Delayed menarche was associated with ductal dilatation.

The average age of first pregnancy was (23.41 ± 4.201) years old. Liu *et al.*^[14] reported that a later age at primiparity was protective against the disease.

Most women in the study group had regular menstrual cycles (77.6%). A case-control study by Mohammed (2021)^[3] also reported similar results, where most of the samples had regular (79.7%) menstrual cycles (86.4%).

The majority of the current sample was not actively smoking. In Mohammed (2021)^[3] the association with smoking was not significant (P-value 0.059). However, some studies claim that smoking is strongly associated with the development of ductal ectasia.

This study confirmed the risk factors for ductal dilatation and noted that the patients in this sample had comorbidities, a positive history of chest trauma, alcohol drinkers, coffee drinkers, and contraceptive use. The cause of ductal dilatation is unknown. Ductal dilatation may result from periductal inflammation, in which the duct becomes flattened and filled with unabsorbed material and cellular debris.^[18]

Only a small percentage of the current study sample was alcoholics. Likewise, alcohol consumption was not associated with the development of ductal dilatations (P value 1.00). Whether coffee consumption is associated with the development of benign breast diseases, including ductal ectasia, is the subject of extensive research. In our study, ductal dilation was significantly associated with increased coffee intake (P-value 0.034), but most studies associated it with mastalgia rather than ductal dilation.^[3,19-21] In addition, a study by Mohammed (2021)^[3] found that taking oral contraceptives did not increase the risk of ductal dilatation in patients (P-value 0.446). This fact is confirmed by some other authors who support these present results. Oral contraceptive use has

been associated with mastalgia and fibrocystic disease.^[22]

In this study, pain was the most common symptom, followed by tenderness and discharge. These features were also found in the study of Zhang^[19], who reported that most patients felt pain and tenderness during examination, and nodule formation may be felt during examination, and these three findings were closely related to the diagnosis of catheter. The possible presence of dilatation in each of them was a strong predictor of the disease (P-value 0.000). In a study by Kim *et al.*^[23] A study conducted by Korea University Anam Hospital found bloody nipple discharge in 10 cases (19%).

Breast ultrasonography can be used for the initial evaluation of women under the age of 30 with a palpable mass and as an evaluation for mass detected on mammogram, persistent focal asymmetric density, and palpable mass not seen on mammogram Extra method^[24] for exceptions. Of the methods used to diagnose ductal dilatation in the current sample, ultrasonography was the most common. In Tiu *et al.*^[25] examined 478 suspected patients with ductal dilatation found on ultrasonography, accounting for 81% (387/478).

CONCLUSIONS

The study concluded that the Ductasia is a very common condition in women. It is more common in overweight and obese women, married women and women with breastfeeding history. Comorbidities may pose risks. The regularity of menstruation has nothing to do with the development of ductal ectasia. The presence of pain, tenderness, and nodules are strong indicators of the disease. The most predictive test is a breast ultrasound.

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