

Original Research

To evaluate breast lesions using ultrasonography in women who are pregnant and lactating

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ABSTRACT:

Aim: The purpose of this study is to evaluate breast lesions using ultrasonography in women who are pregnant and lactating. **Material and methods:** This is a research that is both prospective and observational, and it is being carried out at the radiology department. All female patients, regardless of age, who presented themselves for an ultrasound breast examination with symptoms including discomfort, a palpable lump, and breast complaints such as nipple discharge, retraction, and skin thickening were included in the research. **Results:** In this particular research, the ages of patients who presented with breast lesions ranged anywhere from 20 to 70 years, with 50.25 years serving as the mean age. The upper outside quadrant was the location of the majority of the breast lesions, and the right breast was afflicted more than the left. The BIRADS 5 category was given to a total of 17 lesions. BI-RADS 2 was found in 14 of the lesions, making it the second most prevalent group. There were total of 45 benign cases, Fibroadenoma (15) being the commonest, followed by Fibrocystic disease (10), Cysts (8), Mastitis (5), Duct ectasia (4), least being Phylloides, Galactocoele and Papilloma. **Conclusion:** The majority of observations made on pregnant and nursing patients are of a benign nature. When it comes to directing interventional breast operations, ultrasound is the imaging modality of choice for all pregnant women and lactating women under the age of 30. Additionally, ultrasound is the imaging medium of choice for all pregnant women. In the postoperative evaluation of breast cancer patients, ultrasound plays an important role.

Keywords: Breast lesion, Ultrasonography, Pregnant, Lactating women

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INTRODUCTION

The radiological assessment is different for each individual woman based on her age, whether or not she is pregnant, and whether or not she is breastfeeding. Patients are often scanned after a clinical history and comprehensive physical examination have been completed in order to ascertain whether or not there is a fundamental abnormality that may explain for the patient's symptoms. [1] Because it does not expose the patient to radiation, an ultrasound is the imaging method of choice for expecting mothers and nursing mothers who are less than 30 years old. In the event that the ultrasound is negative or displays ambiguous, suspicious, or no results, a mammogram may be an option to explore for these people. [2] Imaging with mammography and ultrasound is often performed on lactating women over the age of 30 who are over the age of 30. Patients

who are nursing are strongly urged to express milk shortly before to having their breasts imaged in an attempt to lower the total breast density. If an ultrasound indicates a worrisome finding in a pregnant patient or if a biopsy of a solid lesion reveals that the lesion is malignant, then a mammogram should be conducted on the patient. A patient who is pregnant and has a lump should not have to wait until after birth to have a comprehensive assessment because of the risk of radiation exposure. [3] The imaging look on ultrasound might change depending on the length of time a woman has been pregnant or whether or not she is nursing. Mammograms often reveal an overall diffuse increase in breast density along with breast enlargement. This is a frequent finding in breast cancer. Due to the increased density of the breasts, mammography has a lower sensitivity (30% for dense breasts compared with 80% for fatty breasts), making

it more difficult to detect cancer. [4] One research reviewed patients with false-negative mammograms and symptomatic cancer, and found that 78% of the mammographically occult lesions were in women with heterogeneously or highly thick tissue. This was identified in the context of an examination of patients with false-negative mammograms and symptomatic cancer. Mammograms reveal exactly the same imaging characteristics of breast cancer in pregnant women as they do in women who are not carrying a child. [5] It is possible that they are speculative or irregular masses, pleomorphic linear branching or clustered microcalcifications, focal asymmetries, or architectural deformation. The overlaying thick tissue might often make it harder to detect the problem since it obscures the results. Patients who are pregnant or nursing have a greater response rate to ultrasound, which may range anywhere from 86.7% to 100%. [6] During pregnancy, the breast has widespread hypoechogenicity along with fibroglandular expansion and enhanced vascularity when examined with ultrasonography. Breasts of nursing women have widespread hyperechogenicity, a pronounced ductal system, and enhanced vascularity. These characteristics may be seen in mammograms. [7] Because it is sensitive and does not expose the patient to any radiation, ultrasonography is the imaging technique that is most suited to examine breast lesions during pregnancy and breastfeeding. [8] In accordance with the ACR Appropriateness Criteria, a pregnant woman who is experiencing pathological nipple discharge or has palpable masses should have an initial evaluation performed using ultrasonography. This will allow the physician to describe the characteristics of the lesion and arrange appropriate treatment. In this article, we address and demonstrate the pathologic alterations that are responsible for the majority of the challenges encountered in radiologic and cytopathologic diagnostic procedures during pregnancy and breastfeeding. In addition, we investigate any medicolegal concerns that may arise during pregnancy, with a special focus on mammography during pregnancy and the potential dangers that this procedure may provide to the developing baby. We place a strong emphasis on the use of ultrasonography (US) as the way of assessing breast diseases that is both the most suitable and effective during pregnancy and breastfeeding.

MATERIAL AND METHODS

This is a research that is both prospective and observational, and it is being carried out at the radiology department.

INCLUSION CRITERIA

All female patients, regardless of age, who presented themselves for an ultrasound breast examination with symptoms including discomfort, a palpable lump, and breast complaints such as nipple discharge, retraction, and skin thickening were included in the research.

EXCLUSION CRITERIA

Patients who had a history of incision and drainage, who had previously been diagnosed, or who were already receiving medical treatment were not allowed to participate in the trial.

Women who were pregnant or lactating who came in for an ultrasound examination had many procedures performed on them, including the correct application of compression, right placement of the transducer, and picture labelling. The patient is placed in a supine posture with the arm on the side being examined lifted over the patient's head in the traditional position for a breast ultrasound examination. This position is used to stabilize, center, and thin down the breast tissue. In order to properly center the breast on a woman who has bigger breasts, it may be necessary to elevate the area directly beneath the shoulder blade. The use of a foam wedge or a roll made of towels or sheets is the most effective method for doing this. When scanning is conducted, it is done so with the amount of compression required to effectively penetrate to the region of interest and get rid of any surface artifacts. It is possible to scan in the plane of ductal anatomy by first scanning in the radial plane, and then scanning in the antiradial plane. Radial scanning is conducted with the long axis of the transducer oriented along the long axis of the ductal and lobar anatomy (nipple to periphery of the breast in a branching pattern). Antiradial scanning is performed with the transducer oriented in the orthogonal plane (from the periphery of the breast inward toward the nipple). In the initial survey, scanning in the transverse and sagittal planes is acceptable. If a lesion is found, however, it is recommended that radial and antiradial scanning be performed. This is because the margins and extension of the mass may be better displayed using these techniques, and using these techniques also increases the possibility of finding other masses within the same ductal system. Labeling the location of the lesion on the picture in accordance with the mammographic clock and noting its distance from the nipple or areolar edge are also required steps. It is essential that each picture be tagged with this information in order to guarantee accurate follow-up or accurate localization for a biopsy. The following types of tumors were used to classify the US results in accordance with the language of the Breast Imaging Report and Data System (BI-RADS): Shape (oval, round or irregular), orientation (parallel to the skin surface or not), margin (circumscribed or not, indistinct, angular, spiculated or microlobulated), echo pattern (anechoic, hypoechoic, hyperechoic or complex), posterior acoustic features (none, enhancement or shadowing), surrounding tissue change (absent or present), vascularity (none, focal or penetrating flow, or diffusely increased flow). The breast imaging report must be categorized into one of seven different categories in order to comply with the BI-RADS vocabulary, which may be found in [12]. BI-RADS 0 - Further assessment required;

BI-RADS 1 - Negative study;

BI-RADS 2- Benign finding (risk of malignancy similar to that of the surrounding parenchyma);

BI-RADS 3 - Probably Benign finding (less than 2% risk of malignancies should be followed up at 6, 12, and 24 months, and then classified as benign category 2 after showing stability for 24 months or biopsied if concerning changes or growth are seen);

BI-RADS 4- lesion is Suspicious for Malignancy (biopsy is offered);

BI-RADS 5- lesions are Highly suggestive of Malignancy; and

BI-RADS 6- lesions are Biopsy-proven Malignant before surgery is obtained (it is suggested that appropriate actions should be taken for these categories).

Those individuals who had BIRADS evaluation categories 4, 5, and 6 belonged to the "Positive" group. All of those with BIRADS evaluation categories numbered 0 through 3 were placed in the "Negative" category. Each patient was given a pathological evaluation, which might have consisted of a FNAC, a biopsy, or both. The two types of biopsies performed were the surgical excision biopsy

and the core biopsy. Surgical specimens had been preserved in a solution containing 10% formaldehyde and then sliced into serial layers that were 5 mm thick. Independent evaluations of the histopathological slides included inside each tumor were performed by pathologists. The cytology results were analyzed and categorized as being either benign, suggestive for carcinoma, malignant, or insufficient. If the cytology results indicated a possible malignancy, then a histology examination was carried out. In order to establish the sensitivity, specificity, and accuracy of the sonographic exams, BI-RADS criteria were paired with US guided FNAB and then linked with pathological results. Following the completion of the pathological examination, patients were reexamined in the outpatient clinic using the pathology report to arrange any further therapy that may be necessary.

RESULTS

Table 1 presents the results of an examination of one hundred patients, of which 45 instances were found to be benign, 5 cases were found to be malignant lesions, and the other cases were normal.

Table 1: BIRADS Score

BIRADS Score	Age group in years		
	20-40	40-60	60-70
0	0	0	0
1	0	0	0
2	5	7	2
3	1	3	6
4	1	1	2
5	1	10	6
6	0	0	0
Total	8	21	16

Table 1 shows the results of clinical, sonographic, and FNAB examinations performed on the remaining 45 consecutive patients (BIRADS 2 to 6). In this particular research, the ages of patients who presented with breast lesions ranged anywhere from 20 to 70 years, with 50.25 years serving as the mean age. 8 patients were younger than 40 years old, and 16 patients were between the ages of 60 and 70 years old. Twenty-one patients had breast lesions that developed between the ages of 40 and 60. The upper outside quadrant was the location of the majority of the breast lesions, and the right breast was afflicted more than the left. The BIRADS 5 category was given to a total of 17 lesions. BI-RADS 2 was found in 14 of the lesions, making it the second most prevalent group.

Table 2: Sonographic diagnosis of Carcinoma Breast compared with pathologic findings

Sonography	Pathology		Total
	Positive	Negative	
Positive	21	4	25
Negative	3	17	20
Total	24	21	45

The patients with malignant disease underwent surgery. The surgical and histo-pathological findings were positive for carcinoma breast in 24 patients in table 2.

Table 3: Distribution of Benign lumps

Benign lumps	Number of patients
Fibroadenoma	15
Fibrocystic disease	10
Cysts	8
Mastitis	5

Duct ectasia	4
Phylloides	1
Galactocele	1
Papilloma	1

There were total of 45 benign cases, Fibroadenoma (15) being the commonest, followed by Fibrocystic disease (10), Cysts (8), Mastitis (5), Duct ectasia (4), least being Phylloides, Galactocele and Papilloma in table 3.

Table 4: Results of Sonographic studies in diagnosis of Breast Disease

Breast disease	Proven on Histopathology	Sonography			
		True Positive	True Negative	False Positive	False Negative
Benign	21	17	21	4	3
Malignant	24	22	16	3	4

DISCUSSION

Breast symptoms, which may include soreness, tenderness, stiffness, and palpable lumps, are experienced by a significant number of nursing mothers. These individuals are often referred for additional testing as a result of the rising awareness of breast cancer. While a woman is nursing, her breasts are exposed to circulating hormones, which may cause glandular proliferation, ductal dilatation, and stromal involution. Because of this, a physical examination of the breasts when they are breastfeeding may be challenging, and a radiologic assessment is often required. [9] Mammography should be reserved for patients who have ambiguous or questionable lesions on US scans, since it has been indicated that ultrasound should be the first-line imaging for symptomatic women less than 30 years of age, regardless of whether the woman is lactating or pregnant. Ultrasound scans should be used instead of mammography. The use of ultrasound has shown to be fairly effective in displaying both real masses and normal breast parenchyma, the latter of which may exhibit palpable nodularity during breastfeeding. In some circumstances, mammography may be conducted immediately after nursing in order to prevent high-density parenchyma that is associated with residual milk components. [10] However, despite the possibility of changed results owing to physiologic changes, magnetic resonance imaging continues to be an effective tool for the identification and characterization of breast lesions that occur during breastfeeding. [11]

A broad variety of ages, from 20 to 70 years, was represented among the ladies who participated in our research. 50.25 years was the age that was considered to be the mean. This research is comparable to one that was conducted by Cacala SR et al., in which the mean age of the women was 47 years, with a range of 18-88 years; this study is also close to being comparable to studies conducted by Brennan M et al. and Ayyappan AP MS et al., in which an age range of 14-70 and a mean age of 41 years were recorded. [12-14] In our research, 21 of the patients who had breast lesions were between the ages of 40 and 60 years old, while 8 of the patients were younger than 40 years old, and 16 of the patients were between the ages of

60 and 70 years old. According to the BI-RADS evaluation, the majority of patients with benign conditions (46.67%) were between the age range of 40-50 years old. This observation is in keeping with the findings of Baker TP et al, in which they discovered that individuals with malignancy were in their 40s or 50s. [15] Out of the 15 women that participated in our research, fibroadenomas were the most prevalent. The primary types of additional lumps were referred to as fibrocystic changes and inflammatory alterations respectively. According to the results of two other research, ours did not have the highest rate. 73% of individuals in the younger age group developed fibroadenoma. [16] The different ethnicities of the participants in these research may be able to shed some light on these findings. The results of our investigation were similar to the findings of Litton JK et al, who reported 14% of individuals with benign lesions having fibrocystic alterations. Our study had 10 patients. [17] Out of the 5 patients, 5 of them had mastitis, and the majority of them were above the age of 30. This incidence was decreased when compared to the other trials, with the exception of the one conducted by Kang YD and colleagues. They found that only 2.5% of their patients had mastitis. [18-20] In our and other researchers' investigations, the incidence of other benign tumors was quite low. Phyllodes tumor, galactocele, lipoma, and sclerosingadenosis were some of the rare things that were found. Because of this, making comparisons between the outcomes was challenging. In western nations, benign tumors account for 90 percent of all lumps on average.

CONCLUSION

Patients who approach with a breast issue during pregnancy or breastfeeding offer a difficult diagnostic challenge because of the substantial physiological changes that occur throughout these life stages. The majority of observations made on pregnant and nursing patients are of a benign nature. When it comes to directing interventional breast operations, ultrasound is the imaging modality of choice for all pregnant women and lactating women under the age of 30. Additionally, ultrasound is the imaging medium of choice for all pregnant women. In the postoperative

evaluation of breast cancer patients, ultrasound plays an important role. Evaluation of postoperative recurring breast masses and postsurgical sequelae, such as infection and fat necrosis, as well as the exclusion of recurrent illness may benefit from its use.

REFERENCE

1. Liberman L, Giess CS, Dershaw DD, Deutch BM, Petrek JA. Imaging of pregnancy-associated breast cancer. *Radiology* 1994;191:245-248.
2. Robbins J, Jeffries D, Roubidoux M, Helvie M. Accuracy of diagnostic mammography and breast ultrasound during pregnancy and lactation. *AJR Am J Roentgenol*. 2011;196(3):716-722.
3. Joshi S, Dialani V, Marotti J, Mehta TS, Slanetz PJ. Breast disease in the pregnant and lactating patient: radiological-pathological correlation. *Insights Imaging* 2013;4:527-538.
4. Taylor D, Lazberger J, Ives A, Wylie E, Saunders C. Reducing delay in the diagnosis of pregnancy-associated breast cancer: how imaging can help us. *J Med Imaging Radiat Oncol*. 2011;55(1):33-42.
5. Vashi R, Hooley R, Butler R, Geisel J, Philpotts L. Breast imaging of the pregnant and lactating patient: imaging modalities and pregnancy-associated breast cancer. *AJR Am J Roentgenol* 2013;200:321-328.
6. Son EJ, Oh KK, Kim EK. Pregnancy-associated breast disease: radiologic features and diagnostic dilemmas. *Yonsei Med J*. 2006;47(1):34-42.
7. Ahn BY, Kim HH, Moon WK, Pisano ED, Kim HS, Cha ES, et al. Pregnancy- and lactation-associated breast cancer: mammographic and sonographic findings. *J Ultrasound Med* 2003; 22:491-497.
8. Tirada N, Dreizin D, Khati NJ, Akin EA, Zeman RK. Imaging pregnant and lactating patients. *Radiographics* 2015;35:1751-1765.
9. Whang IY, Lee J, Kim KT. Galactoceles as a changing axillary lump in a pregnant woman. *Arch Gynecol Obstet*. 2007;276(4):379-382.
10. Canoy JM, Mitchell GS, Unold D, Miller V. A radiologic review of common breast disorders in pregnancy and the perinatal period. *Semin Ultrasound CT MR* 2012;33:78-85.
11. Oh YJ, Choi SH, Chung SY, Yang I, Woo JY, Lee MJ. Spontaneously infarcted fibroadenoma mimicking breast cancer. *J Ultrasound Med*. 2009; 28(10):1421-1423.
12. Cacala SR. Breast conditions during pregnancy and lactation: an understanding of unique breast conditions associated with pregnancy and lactation is essential for evaluation and management of breast problems in pregnant or lactating women. *Contin Med Educ* 2010;28:508-512.
13. Brennan M, Houssami N, French J. Management of benign breast conditions. Part 2—breast lumps and lesions. *Aust Fam Physician*. 2005;34(4):253- 255.
14. Ayyappan AP, Kulkarni S, Crystal P. Pregnancy-associated breast cancer: spectrum of imaging appearances. *Br J Radiol*. 2010;83(990):529-534
15. Baker TP, Lenert JT, Parker J, Kemp B, Kushwaha A, Evans G, Hunt KK. Lactating adenoma: a diagnosis of exclusion. *Breast J*. 2001;7(5):354- 357.
16. Saunders C, Taylor D, Ives A. The role of breast imaging during pregnancy and lactation in the diagnosis of breast malignancy. *Radiographer* 2012;59:119-123.
17. Litton JK, Theriault RL, Gonzalez-Angulo AM. Breast cancer diagnosis during pregnancy. *Womens Health (Lond Engl)*. 2009;5(3):243-249.
18. Kang YD, Kim YM. Comparison of needle aspiration and vacuumassisted biopsy in the ultrasound-guided drainage of lactational breast abscesses. *Ultrasonography* 2016;35:148-152.
19. Barnes DM, Newman LA. Pregnancy-associated breast cancer: a literature review. *Surg Clin North Am*. 2007;87(2):417-430.
20. Tremblay E, Therasse E, Thomassin-Naggara I, Trop I. Quality initiatives: guidelines for use of medical imaging during pregnancy and lactation. *Radiographics* 2012;32:897-911.