

The frequency of pregnancy-associated breast diseases: a prospective cross sectional study

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ABSTRACT

Background. Breast masses are common findings that observed during pregnancy, lactation or within one year after giving birth. The breast is a hormone-sensitive organ that subjects to various changes in response to hormonal changes. This study targets to identify the various types of breast masses, including benign and malignant lesions that may arise during pregnancy.

Patients and methods. This is a prospective cross-sectional study conducted between June 2022 and December 2023 and enrolled 200 women who presented with breast lumps during pregnancy. All women were subjected to a thorough physical examination and investigations, including full blood picture, erythrocyte sedimentation rate, and CA15-3 tumor marker. To confirm the diagnosis, all women had ultrasound examinations and Fine Needle Aspiration Cytology (FNAC). Those with suspicion of malignancy underwent ultrasound-guided biopsy.

Results. The range of ages of participants were extend from 19 to 50 years with a range gestational age of 12 to 40 weeks. Our results showed that the highest percentage of women presented with breast lesions was in the age group of 19-30 years (about 57.5% of cases), while in the age groups of (31-40 and 41-50) years, the percentage of affected pregnant women were 28% and 14.5%, respectively. Moreover, the final diagnosis of various breast lesions predominantly revealed benign breast masses, in approximately 98% of cases. Out of the total patients, 81 (40.5%) were diagnosed with fibroadenomas, which are the most prevalent benign breast masses. Next, lactating adenomas, which affected up to 25% of women, followed by galactoceles, which were discovered in 22% of women, along with papillomas, which identified in 21 women (10.5% of the total). Breast cancer, on the other hand, had the lowest prevalence among the pregnant women compared to benign breast lesions, where only five cases were reported (about 2% of all cases).

Conclusions. The breast cancer was discovered in only 2% of cases, while the majority of the breast lumps, which observed during pregnancy, were benign with fibroadenoma being the most common entity, following by lactating adenoma, galactocele and finally papilloma.

Keywords: breast masses, fibroadenomas, galactoceles, papillomas, pregnant women, ultrasound-guided biopsy, CA15-3 tumor marker

INTRODUCTION

The breast tissue is subjected to elevated estrogen and progesterone hormones during pregnancy. Increasing levels of these hormones results in a consequently

increase in ductal and lobular growth, as well as proliferation of blood vessels and a reduction in stroma [1,2]. Due to increasing breast density, palpable nodularity and stiffness, the clinical diagnosis of palpable lesions is made more difficult [3]. Benign breast lesions common-

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METHODS

ly encountered during pregnancy include fibroadenomas, lactating adenomas, galactocele, infections, and inflammatory changes [3,4].

The predominant benign solid breast lesion is fibroadenoma, resulting from the growth of intra-lobular stroma [4,5]. The anticipated growth of fibroadenomas during pregnancy is attributed to elevated hormones levels, leading to the identification of previously unnoticed masses [2,6].

Furthermore, galactocele is another identified non-cancerous growth abnormality. Although most commonly detected during lactation, it can also be detected during the last trimester of pregnancy [1,7]. Moreover, lactating adenoma is a non-malignant stromal tumor that often presents as a detectable movable mass that significantly increases in size during pregnancy. It is common for them to manifest in the latter stages of pregnancy or early lactation and often disappears spontaneously once lactation concludes [8].

Another condition that can develop during pregnancy is mastitis. While it is not prevalent during pregnancy, it is quite common during breastfeeding, where it can affect up to twenty-five percent of nursing women [7,9]. Regarding malignant breast lesions, they are relatively infrequent disorders compared to other breast diseases during pregnancy. However, compared to other cancers, breast cancer is the second common reported cancer during pregnancy [10].

For effective management of these patients, it is necessary to know the clinical and imaging results related to physiological breast changes and common benign breast diseases. Ultrasound remains the most effective initial imaging tool for assessing breast abnormalities arising during pregnancy. The safety of ultrasound for breast examination during pregnancy is attributed to its sensitivity and absence of potential fetal irradiation [8], nevertheless, anytime an image raises suspicion, it becomes mandatory to carry out mammography, biopsy, or both [11]. Fine Needle Aspiration Cytology (FNAC) has several advantages for assessing breast tumors arising during pregnancy and breastfeeding. These factors encompass less surgical involvement, uncomplicated operation, safety, and cost-effective approach; however, cytological interpretation is regarded as difficult because of the atypia associated with secretory change in glandular epithelium [12]. The use of Magnetic Resonance Imaging is restricted during pregnancy because of uncertainties over gadolinium exposure and insufficient evidence on the safety of this method for this specific purpose [11].

The objective of this study was to identify the various types of breast lesions, both benign and cancerous lesions, which may manifest in women throughout the pregnancy.

This prospective cross-sectional study was conducted at outpatients of Al-Sader Teaching Hospital and private clinics in Basrah from June 2022 to December 2023 and included a cohort of two hundred women. The study was approved and registered by the ethical committee of the College of Medicine, University of Basrah. Informed written consents were obtained from all the participants.

Women who were of reproductive age and who presented with identifiable breast masses during pregnancy were eligible for inclusion in the study. On the other hand, women who had a previous history of breast lesions, whether benign or malignant, were excluded. A detailed history and physical examination were performed on each individual. Additionally, all of the participants underwent thorough investigations that encompassed full blood picture, erythrocyte sedimentation rate, and CA15-3 tumor marker, as well as an ultrasound examination and FNAC. For those who had a Breast Imaging Reporting and Data System (BIRADS) score of four or higher, an ultrasound-guided biopsy was performed.

RESULTS

Two-hundred pregnant women, with ages ranging from 19 to 50 years and a range of gestational age between 12-40 weeks were enrolled in our study. The results showed that the highest percentage of women presented with breast lesions was in the age group of 19-30 years (about 57.5% of cases). While in the age groups of (31-40 and 41-50) years, the percentage of affected pregnant women were (28% and 14.5%), respectively, as illustrated in Table 1.

TABLE 1. number and percentage of affected women versus age groups

Age groups (years)	Numbers of women	Percentage
19-30	115	57.5%
31-40	56	28%
41-50	29	14.5%
Total	200	100%

Furthermore, benign breast lesions were the major findings in the final diagnosis of pregnant women with a variety of breast masses, accounting for approximately 98% of the cases (Table 2). Fibroadenoma was the most prevalent benign lesion, with 81 women of the total pregnant women being affected (about 40.5% of total, 41.33% of benign lesions). The subsequent benign lesions were lactating adenoma, which affected up to 25% of pregnant women, and galactocele, which was

identified in 22% of women. In addition, twenty-one pregnant women (10.5% of the total) were diagnosed with papillomas that account for 10.71% of benign lesions. In contrast, breast cancer had the lowest prevalence among pregnant women compared to benign breast lesions, where only four cases were identified with invasive ductal carcinoma (about 2% of all cases), as shown in Tables 2 and 3.

TABLE 2. *The number and percentage of breast masses in pregnant women*

Type of breast mass	Number	Percentage
Benign mass	196	98%
Malignant mass	4	2%
Total	200	100%

TABLE 3. *The types of benign breast diseases in pregnant women*

Types of benign breast mass	Number	Percentage out of benign lesions
Fibroadenoma	81	41.33%
Lactating adenoma	50	25.51%
Galactocele	44	22.45%
Papilloma	21	10.71%
Total	196	100%

DISCUSSION

A comprehensive understanding of breast disorders that affect the breast during pregnancy is crucial. Our study included 200 women whom presented with detectable breast masses throughout their pregnancy, and the results revealed that masses of benign origin were the main findings. Among pregnant women, fibroadenoma was the most prevalent benign mass, accounting for 40.5% of cases. These results run in agreement with previous researches that identified fibroadenoma as the most prevalent benign breast tumor during pregnancy [13,14].

Furthermore, our investigation identified lactating adenoma as a second frequently observed breast mass with a 25% of pregnant women being affected while galactoceles and papillomas were identified as the third and fourth most common lesions during pregnancy, respectively. Galactocele is a complex condition resulting from alterations in the secretory epithelium of the breast, prolactin stimulation, and ductal obstruction [15], while a benign intra-ductal papilloma is the most often occurring benign tumor connected with

pathological bloody nipple discharge during pregnancy [9,16].

Additionally, our findings indicated that only 2% of breast lumps reported by pregnant women were malignant (ductal carcinoma), and these results support prior investigations that showed a higher percentage of benign breast lesions in comparison to malignant ones during biopsies and radiological evaluations of pregnant women with breast diseases [11,13,17]. Although pregnancy-associated breast cancer (PABC) is a relatively infrequent disorder compared to other breast diseases during pregnancy, it is the second common reported cancer during pregnancy following cervical cancer. The reported incidence rates of PABC range from 15 to 35 breast cancer cases per 100,000 newborns [18, 19].

Previously, the terms pregnancy-associated breast cancer (PABC) and breast cancer during pregnancy (PrBC) had been used interchangeably, where PABC often encompasses both breast cancer detected during pregnancy and those diagnosed between six months to one year following giving birth. Recent recommendations suggest distinguishing breast cancer during pregnancy (PrBC) from breast cancer that arises during the post-partum period, which can last for five to ten years after birth [10]. After a breast cancer diagnosis has been established, it is crucial to initiate a prompt therapy since the observations reported that the prognosis for early-detected cancer remains unchanged when compared to non-pregnant women of the same age and stage, while those with advanced breast cancer carry worse prognosis than those with non-pregnancy related breast cancer [20].

The limitations of the current study were the small sample size and inability to focus on trimester related changes as well as puerperal related breast changes.

CONCLUSIONS

The majority of breast masses, which identified during pregnancy, were of benign origin. The most common benign breast masses were fibroadenomas and lactating adenomas, then galactoceles and papillomas, while breast cancer particularly ductal carcinoma represented a mere 2% of all breast masses that observed during pregnancy. Future researches are needed to include large number of participants and take in account the puerperal and lactation related breast changes.

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