

**ORIGINAL RESEARCH****Effectiveness of regular screening during lactational period as preventive measure for acute inflammatory lesions of breast: A comparative study with historical cohort****<sup>1</sup>Dr. Neha Shrivastava, <sup>2</sup>Dr. Hradyyesh Dixit, <sup>3</sup>Dr. Yogesh Kailasia, <sup>4</sup>Dr. Abhilash Singh**<sup>1,2</sup>P.G. Resident, <sup>3</sup>Associate Professor, <sup>4</sup>Assistant Professor, Department of Surgery, Shyam Shah Medical College, Rewa, Madhya Pradesh, India**Corresponding Author**

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**Abstract**

**Background:** A wide range of breast lesions can arise during pregnancy and lactation, from benign, inflammatory diseases to malignant lesions. Prevention of acute inflammatory lesions of breast needs a good breast care regime and health education. In the light of this, we conducted this study to understand the effect of regular screening during lactational period as preventive measure.

**Materials and methods:** In Rewa, Madhya Pradesh, the General Surgery and Obstetrics and Gynecology Departments of Sanjay Gandhi Memorial and Gandhi Memorial Hospital, affiliated with Shyam Shah Medical College, have collaborated to undertake a prospective observational study. Primigravidae in their third trimester of pregnancy (for registration and education on breast care) and breast feeding women during the 15-month research period [1 April 2021 to 30 June 2022]. All the study participants were provided informed written consent forms before the start of the study. Strict confidentiality about their particulars was maintained throughout the study. The study was approved by Institutional Ethics committee before the start of the study.

**Results:** The most common presentation during follow up is Mastalgia(16.60%), and only 12 % presented with painful lump leading to abscess , and majority 58.20% did not showed any symptoms. during screening total 209 cases were examined via USG bilateral breast out of which maximum showed mastitis (34.92%), and 31.56% showed abscess formation. Next Majority showed no abnormal finding (25.8%) on USG. Small percentage of cases (4.34%) also showed galactocele formation. When compared to historical cohorts, the percentage of breast abscess, mastitis and mastitis with galactocele were significantly lower in the present breast care regime advised to the mothers.

**Conclusions:** The findings of this study suggest that regular screening and breast care education can significantly reduce the incidence of inflammatory breast disease in lactational mothers, which will eventually lead to uninterrupted 6 month breastfeeding absolutely vital for growth and development of newborn. Also in many studies breastfeeding have found to be good factor in reducing risk of breast cancer in later life. While most women receive appropriate management advice from health professionals, a clinically significant number of women are advised to stop breastfeeding from the affected breast or to stop breastfeeding altogether.

**Key words:** Acute inflammatory lesions of breast; Prevention; Screening

## Introduction

According to numerous research, a history of exclusive breastfeeding has been linked to a lower risk of several diseases in both infants and mothers. (1–3)The most frequent cause of premature breastfeeding termination, with a prevalence of up to 20% among breastfeeding moms, is problems and diseases of the female breast brought on by breastfeeding. (4–6)While nursing, nipple issues are the most common, including abrasions, cracks, ulcers, engorgement, puerperal mastitis, and abscesses. Mastitis is characterized as breast gland irritation. Acute postpartum mastitis, a severe, incapacitating illness that causes red, aching breasts and fever, affects 20% of breastfeeding women. Having the infant improperly attached to the breast might result in nipple injuries. When women are in pain when nursing, the likelihood of weaning is 14.7 times higher. In the early days following delivery, skin injury to the areola and nipples can be detected in more than 30% of all women. Secondary colonization with pathogens may develop on these abrasions, fissures, and ulcerations, resulting in an infection. The most frequent lesions in women who are breastfeeding are breast cysts. When nursing is stopped, milk stagnates, causing milk ducts to enlarge and developing cysts and cysts.(7)

A relatively frequent galactoceles consequence is infection. Mastitis with infection may be puerperal (lactating) or non-lactating (e.g., duct ectasia). Idiopathic granulomatous inflammation and other inflammatory disorders (such as a foreign body reaction) are among the non-infectious causes of mastitis.(8) Non-lactational abscesses are also common in premenopausal older women. Centrilobular granulomas are the hallmark of the uncommon benign inflammatory breast condition idiopathic granulomatous mastitis (IGM).(9) IGM affects premenopausal breastfeeding women who might have a chronic or recurrent disease course. It also has a connection to hyperprolactinemia. In light of this, we conducted the current study to ascertain the role that breast care education and screening play in the prevention of the onset of acute inflammatory breast disease, to ascertain the prevalence of acute inflammatory breast lesions among lactating mothers in our institute, and to ascertain the risk factors that increase the likelihood that inflammatory breast lesions will develop in lactating mothers in our institute.

## Materials and methods

In Rewa, Madhya Pradesh, the General Surgery and Obstetrics and Gynecology Departments of Sanjay Gandhi Memorial and Gandhi Memorial Hospital, affiliated with Shyam Shah Medical College, have collaborated to undertake a prospective observational study. Primigravidae in their third trimester of pregnancy (for registration and education on breast care) and breastfeeding women during the 15-month research period [1 April 2021 to 30 June 2022].All the study participants were provided informed written consent forms before the start of the study. Strict confidentiality about their particulars was maintained throughout the study. The study was approved by Institutional Ethics committee before the start of the study.

According to a study by Li D et al.(10), most of the acute inflammatory lesions of the breasts they examined were caused by mastitis, accounting for about 59.1% of the cases in their study. We determined the minimum sample size to be 371 with a 95% and 5% absolute error taking this into account. We rounded our sample size to 500 after accounting for a 30% non-response rate. In the current study, all nursing mothers who were older than 18 years old were enrolled. The study excluded patients with breast cancer, non-puerperal women, patients unwilling to participate, and patients lost during follow-up. Clinical details, laboratory findings, imaging-related information, and microbiological research were all included in the data collection. Also, more information about the procedure and follow-up was gathered. Based on the final histology diagnosis, patients were divided into groups. The patient received a full explanation of how to care for their breasts while nursing. A thorough history was acquired of their symptoms, including the length of time they persisted with them, how the condition started, how it developed, and any treatments or surgical interventions they had. Patients were extensively assessed for general, local, and systemic examinations and contacted for follow-up care per the recommended timeframe. In order to examine the efficacy of our teaching program, we included

historical rates of different acute inflammatory lesions in our institute, which were two years before the present study duration. Patients with signs and symptoms were thoroughly investigated and treated as necessary. (With permission, an excerpt from the record section)

### Statistical analysis plan

The data was collected, compiled, and analyzed using EPI info (version 7.2). The qualitative variables were expressed in terms of percentages. The quantitative variables were categorized and expressed in percentages or terms of mean and standard deviations percentages. The difference between the two proportions was analyzed using the chi-square or Fisher exact test. All analysis was two-tailed, and the significance level was set at 0.05.

### Results

We have included 500 cases in the present study.

**Table 1: Demographic particulars of the subjects**

Demographic particulars	No of Cases	Percentage
<b>Age group(in yrs.)</b>		
<20yrs	55	11.00
21-30 yrs	215	43.00
31-40yrs	179	35.80
41-50yrs	44	8.80
>50yrs	07	1.40
<b>Socioeconomic status</b>		
Highincome	22	4.40
Middleincome	157	31.40
Lowincome	321	64.20
<b>Diabetes</b>		
Yes	158	31.60
No	342	68.40
<b>Hemoglobin</b>		
<10%	346	69.20
>10%	154	30.80

Majority of the cases were in the age group of 31 to 40 years in the present study, belonged to low income socioeconomic status, 31.60% had history of diabetes, 69.20% had haemoglobin less than 10%.

**Table 2: Distribution of the mothers based on the chief complaints(n=500)**

SN	Clinical Features	No of Cases	Percentage
1.	No specific symptoms	291	58.20
2.	Mastalgia	83	16.60
3.	Fever	50	10.00
4.	Painful lump	60	12.00
5	Painless lump	16	3.20
	<b>Total</b>	<b>500</b>	<b>100</b>

It is evident from the above table that during follow-up after breast care education most common presentation during follow up is Mastalgia(16.60%), and only 12 % presented with painful lump leading to abscess , and majority 58.20% did not showed any symptoms.

**Table3: Distribution of themothers based on USG Findings(n=209)**

USG Findings	No of Cases	Percentage
Mastitis	73	34.92
Within normal limits	54	25.8
Left side forming breast abscess With nonaspirable content	21	10.04
Right side upper quadrant Abscess with aspirable content.	19	9.09
Right side lower quadrant and Left side upper quadrant abscess with aspirable content.	17	8.13
Left side upper quadrant Abscess with aspirable content.	9	4.34
Galactocele formation	9	4.34
Fibroadenoma	7	3.34
<b>Total</b>	<b>209</b>	<b>100.0</b>

It is evident from the table that during screening total 209 cases were examined via USG bilateral breast out of which maximum showed mastitis (34.92%), and 31.56% showed abscess formation. Next Majority showed no abnormal finding (25.8%) on USG. Small percentage of cases (4.34%) also showed galactocele formation.

**Table4-Result of Pus culture in breast abscess cases (n=76)**

Pus Culture	No of Cases	Percentage
Staphylococcus aureus	45	59.22
No organism found	20	26.32
E.Coli	08	10.52
MRSA	03	3.94
<b>Total</b>	<b>76</b>	<b>100.0</b>

It is evident from the above table during course of study total 76 patient developed breast abscess out of which most commonly caused by staphylococcus aureus (59.22%) and 10.52% showed E. Coli growth, small percentage also showed MRSA growth (3.94).

**Table 5: Effectiveness of breast care education when compared with historical cohorts**

Final diagnosis	After intervention(n=500)		Historical cohort(n=300)		P value
	Frequency	Percentage	Frequency	Percentage	
Breast abscess	64	12.80	88	29.33	0.0322
Mastitis	73	14.60	93	31.00	0.0211
Mastitis with Galactocele	7	1.40	10	3.33	0.7821

When compared to historical cohorts, the percentage of breast abscess, mastitis and mastitis with galactocele were significantly lower in the present breast care regime advised to the mothers. ( $p < 0.05$ )

**Table 6: Factors responsible for acute inflammatory diseases during lactational period**

Factors	Acute inflammatory diseases				P value
	Present		Absent		
	Frequency	Percentage	Frequency	Percentage	
<b>Anemia</b>					
<10gm%	147	42.4	199	57.50	0.0001
>10gm%	62	40.2	92	59.74	
<b>Socio-economic status</b>					
High	5	22.7	15	68.18	0.0202
Middle	50	31.8	107	68.15	

Low	154	47.9	167	52.02	
<b>Diabetes</b>					
Present	108	68.3	50	31.6	<0.001
Absent	124	36.2	218	63.7	

Socio-economic status, presence of diabetes and low hemoglobin percentage were significant factors which affected the incidence of acute inflammatory diseases during the lactational period. ( $p < 0.05$ )

## Discussion

The prospective study was conducted at Sanjay Gandhi Memorial and Gandhi Memorial Hospital's general surgery departments, obstetrics and gynecology. The study's primary goal was to determine how well an educational program for lactating mothers prevented various acute inflammatory illnesses while a baby was being breastfed.

Of the 500 cases examined, breast abscess affected 12.80%, mastitis affected 14.60%, and mastitis with galactocele affected 1.40%. Three hundred sixteen patients (59.1%) were assigned to the breast inflammation group among the patients evaluated by Li D et al.(10), while 219 patients (40.9%) were assigned to the breast abscess group. According to Amir LH et al.(11), two hundred and seven of the 1193 women who were studied had mastitis. Five women experienced breast abscesses: 2.9% of women who received antibiotics for mastitis (95% CI 1.0-6.7); 0.4% of women who started nursing (95% CI 0.14-0.98). The estimated incidence of lactational breast abscesses was 0.74% (28/3792), according to Egbe TO et al(12). To determine the causes of puerperal breast abscesses and to assess the available treatments, Dener C et al.(13) undertook a prospective study. One hundred twenty-eight nursing mothers with breast infections were monitored during the four-year trial. 102 (80%) had mastitis, and 26 (20%) had breast abscesses. According to Scott JA et al.(14), 74 women (18%) had at least one episode of mastitis. 53% of the initial episodes occurred in the first four weeks following delivery. In Ethiopia, the prevalence of self-reported lactational mastitis ranged from 3.1% to 12.0%, according to Ouedraogo MO et al.(15) Around 17.0% of women with mastitis ceased nursing due to the condition.

Socioeconomic status (inflammatory breast diseases were found to be more common in patients with low socioeconomic status (47.9%)), the presence of diabetes (according to our study, diabetic patients were more prone to develop symptoms (68.3%), and lower hemoglobin percentage (patients were having more incidence of symptom (42.4) than higher hemoglobin (40.2%) were the risk factors for the development of acute inflammatory lesions of the breast included in the current study.

In their study, Yu Z et al.(16) found that hospitalization time following acute mastitis, galactostasis, parity, nipple injuries, antibiotic treatment course, and hyperglycemia were all high-risk variables for SM during breastfeeding. Patients admitted more than 72 hours after developing acute mastitis had a considerably higher incidence of SM than those admitted less than 72 hours later ( $p = 0.0001$ ). Galactostasis patients were significantly more likely to acquire SM than were individuals without galactostasis ( $p = 0.0001$ ), and primiparous patients had a significantly greater incidence of SM than did pluriparous patients ( $p = 0.003$ ). Patients with diabetes had a considerably higher incidence of SM than those without diabetes ( $p = 0.002$ ). SM was more common in patients with nipple injuries than in patients without nipple injuries ( $p = 0.0001$ ). The incidence of SM, however, did not differ significantly depending on the antibiotic treatment regimen ( $p = 0.134$ ). Staphylococcus aureus and MRSA were the most frequently found isolates, accounting for 60% of breast abscess cases. Retrospective data on 219 breast abscess cases and 316 mastitis cases were gathered and reviewed by Li D et al.(10) 203 (53.9%) of the 535 patients tested positive for staphylococcus aureus. Methicillin-sensitive staphylococcus aureus (MSSA) accounted for 133 (65.5%) cases, whereas MRSA accounted for 70 (34.5%) cases. The percentage of breast abscess, mastitis, and mastitis with galactocele was much reduced in the current breast care regimen recommended to the moms as compared to historical cohorts.

The current study had a few drawbacks. The study could have been considered an experimental study to compare the current teaching program with the usual standard of care, even if a good sample size was

included. Such efficacy programs had to have ideally been centered in the community. However, our work was the first to tackle this problem.

### Conclusions

The findings of this study suggest that regular screening and breast care education can significantly reduce the incidence of inflammatory breast disease in lactational mothers, which will eventually lead to uninterrupted 6 month breastfeeding absolutely vital for growth and development of newborn. Also in many studies breastfeeding have found to be good factor in reducing risk of breast cancer in later life.

While most women receive appropriate management advice from health professionals, a clinically significant number of women are advised to stop breastfeeding from the affected breast or to stop breastfeeding altogether. Following this advice can result in needlessly and prematurely depriving infants of the well-known nutritional and immune benefits of breast milk. Lactating inflammatory breast disease can usually be treated conservatively and on an outpatient basis. The majority of breastfeeding complications and diseases occur only after hospital discharge when there is no intensive care through specialized health workers anymore. It is therefore very important that all concerned professional groups (surgeons, gynecologists, dermatologists, pediatricians, lactation consultants, midwives) inform women in a timely manner about the prevention of these inflammatory complications important to.

### Conflict of interest

None

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None

### References

1. Kelishadi R, Farajian S. The protective effects of breastfeeding on chronic non-communicable diseases in adulthood: A review of evidence. *Adv Biomed Res.* 2014;3:3.
2. Stuebe A. The risks of not breastfeeding for mothers and infants. *Rev Obstet Gynecol.* 2009;2(4):222–31.
3. Shamir R. The Benefits of Breast Feeding. *Nestle Nutr Inst Workshop Ser.* 2016;86:67–76.
4. Babakazo P, Bosonkie M, Mafuta E, Mvuama N, Mapatano M-A. Common breastfeeding problems experienced by lactating mothers during the first six months in Kinshasa. *PLoS One.* 2022;17(10):e0275477.
5. D'Alfonso TM, Ginter PS, Shin SJ. A Review of Inflammatory Processes of the Breast with a Focus on Diagnosis in Core Biopsy Samples. *J Pathol Transl Med.* 2015 Jul;49(4):279–87.
6. Karaçam Z, Sağlık M. Breastfeeding problems and interventions performed on problems: systematic review based on studies made in Turkey. *Turk Pediatr Ars.* 2018 Sep;53(3):134–48.
7. Yu JH, Kim MJ, Cho H, Liu HJ, Han S-J, Ahn T-G. Breast diseases during pregnancy and lactation. *Obstet Gynecol Sci.* 2013 May;56(3):143–59.
8. Gada PB, Bakhshi G. Galactocele. In *Treasure Island (FL)*; 2022.
9. Vinayagam R, Cox J, Webb L. Granulomatous Mastitis: A Spectrum of Disease. *Breast Care (Basel).* 2009;4(4):251–4.
10. Li D, Li J, Yuan Y, Zhou J, Xiao Q, Yang T, et al. Risk factors and prognosis of acute lactation mastitis developing into a breast abscess: A retrospective longitudinal study in China. *PLoS One.* 2022;17(9):e0273967.
11. Amir LH, Forster D, McLachlan H, Lumley J. Incidence of breast abscess in lactating women: report from an Australian cohort. *BJOG.* 2004 Dec;111(12):1378–81.

12. Egbe TO, Njamen TN, Essome H, Tendongfor N. The estimated incidence of lactational breast abscess and description of its management by percutaneous aspiration at the Douala General Hospital, Cameroon. *Int Breastfeed J.* 2020 Apr;15(1):26.
13. Dener C, Inan A. Breast abscesses in lactating women. *World J Surg.* 2003 Feb;27(2):130–3.
14. Scott JA, Robertson M, Fitzpatrick J, Knight C, Mulholland S. Occurrence of lactational mastitis and medical management: a prospective cohort study in Glasgow. *Int Breastfeed J.* 2008 Aug;3:21.
15. Ouedraogo MO, Benova L, Smekens T, Sinke GG, Hailu A, Wanyonyi HB, et al. Prevalence of and factors associated with lactational mastitis in eastern and southern Africa: an exploratory analysis of community-based household surveys. *Int Breastfeed J.* 2022 Mar;17(1):24.
16. Yu Z, Sun S, Zhang Y. High-Risk Factors for Suppurative Mastitis in Lactating Women. *Med Sci Monit Int Med J Exp Clin Res.* 2018 Jun;24:4192–7.