

## Original Research

# Retrograde study of bacteriology and incidence of breast abscess in lactating and non-lactating females in last one year

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### ABSTRACT

**Introduction:** Treatment of breast abscesses is based on incision and drainage and antibiotic therapy against the bacteria causing infection. The aim of this study was to know the bacteriological profile and incidence of breast abscess.

**Methods:** 110 Patients with breast pathology had visited to our institution between January 2022 and January 2023.

Out of 110 patients, 56 patients were diagnosed with fibroadenoma, 29 patients were malignant breast tumours, 17 patients had mastalgia, whereas only 20 patients were diagnosed with breast abscess on clinical and USG findings.

In our study patients with age group 30-60yrs were considered in our study, and patients who had history of smoking, DM, HIV, Malignant tumours, Abscesses secondary to surgical wound infection was in exclusion criteria.

The present study was conducted on 20 female patients with provisional diagnosis of breast abscess on clinical basis with an aim to study the bacteriological profile i.e. aerobic and anaerobic bacteria, management of breast abscess and to compare the results of our present study with other relevant studies and to see whether breast abscess is more common in lactating or non-lactating females.

**Results:** Twenty patients were included in our study; In which Staphylococcus aureus was the most frequent agent in lactating women. Anaerobic bacteria were isolated in 4 patients (20%) of abscess cases including (lactating and non-lactating). Whereas in Aerobic bacteria we had 12 patients (60%) lactating and 4 (20%) patients non-lactating.

**Keywords:** Breast abscess, Lactational, Non-Lactational, Incision and Drainage, Aerobes, Anaerobes, Staphylococcus- aureus.

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### INTRODUCTION

These days more number of patients with breast pathology are visiting to OPD, out of which breast abscess is common diagnosis in Surgery OPD, due lack of awareness among mother related to feeding. Some are managed conservatively and some are managed by operative procedure incision and drainage. Lactational mastitis is seen far less frequently than in former years. Most are caused by Staphylococcus aureus and, if hospital acquired, are likely to be penicillin resistant. The intermediary is usually the infant; after the second

day of life, 50% of infant's harbor staphylococci in the nasopharynx. Although ascending infection from a sore and cracked nipple may initiate the mastitis, in many cases the lactiferous ducts will first become blocked by epithelial debris leading to stasis; this theory is supported by the relatively high incidence of mastitis in women with a retracted nipple. Once within the ampulla of the duct, staphylococci cause clotting of milk and, then multiply within the clot. Abscess formation are mostly seen in two stages during lactation either in first month or at the time of weaning. Breast abscesses are

more common in women belonging to poor socio-economic status and also in females with co-existing medical disorders such as HIV related disorders and diabetes mellitus. Broadly, breast abscesses can be classified into two main types-lactational (Group –A) and non-lactational (Group –B). Lactational breast abscesses are usually characterized by acute onset in post puerperal period and is a very painful condition associated with considerable morbidity. Acute puerperal mastitis is usually the first step heralding onset of this condition with incidence of 2.5% to 33% in lactating women. <sup>[1]</sup> The condition usually resolves if diagnosed early and managed aggressively but is often complicated by abscess formation. The most common presenting symptom is pain and fever which is usually severe in intensity and associated with an obvious erythematous swelling. The aetiology of this condition is blockage of engorged lactiferous ducts leading to milk stasis and subsequent infection. The portal of entry for the bacteria is usually a fissure at the base of the nipple so that infection occurs most often in the early weeks of the puerperium. <sup>[2]</sup> These microorganisms can originate anywhere from the baby's nasopharynx to mother's skin. <sup>[3]</sup>

Although lactational breast abscesses can occur anywhere in the affected breast they are usually peripheral in location. <sup>[4]</sup> Upper and outer quadrant is usually the most common site of localization of these abscesses. <sup>[5]</sup> Non-lactational breast abscesses although uncommon are predominantly encountered in perimenopausal age group. <sup>[6]</sup>

The exact aetiology of these abscesses are obscure. Pre-existing cytomorphological abnormalities such as nipple inversion, duct ectasia, duct metaplasia or other congenital abnormalities in the duct system may have significant role in etio-pathogenesis of these abscesses. <sup>[7]</sup> Organisms present in milk sinus become entrapped and proliferate resulting in abscess formation. <sup>[8]</sup> Breast abscesses lead to morbidity. They also have a tendency to recur and can cause permanent sequelae, such as deformities of the breast or loss of ability to produce milk. <sup>[10]</sup> Breastfeeding women, smokers and diabetic patients are at increased risk of breast abscess. <sup>[10-12]</sup> Treatment is based on drainage and administration of antibiotics. <sup>[10]</sup> The selection of empirical antibiotic therapy for breast abscesses should target the bacteria which is most commonly cause these infections. Studies on the microbiology of breast abscesses published to date indicate that there are a variety of bacterial species that can cause these infections, and demonstrate mixed results in terms of the relative contribution of different species or groups of bacteria. <sup>[11,13-29]</sup> These disparities in the results of published studies may be due, at least in part, to differences in the screening criteria of the subjects and in the methodology adopted to carry out the cultures and interpret their results. The factors that

make it difficult to compare different studies include: a) the fact that some studies include post-surgical infections along with primary breast abscesses, or puerperal and non-puerperal abscesses, and do not provide disaggregated results; <sup>[11,19,20,25,26,28,29]</sup>

b) the fact that most publications, especially the most recent ones, do not describe the methodology used to carry out the cultures, and in particular whether or not the culture has been carried out for anaerobic bacteria; <sup>[11,17-19,21,23,24,26-29]</sup> c) the fact that almost all of the published papers lack a description of the criteria used to interpret the cultures, which is especially important when it comes to attributing relevance to skin commensal bacterial species and common contaminants of cultures. This article studies the aetiology of primary breast abscesses to screen subjects, perform microbiological studies and interpret culture results also see the incidence of breast abscess in age group. The objective of this study was to discover the aetiological agents of breast abscesses in lactating and non-lactating patients in our setting.

## MATERIAL AND METHODS

110 Patients with breast pathology had visited to our institution between January 2022 and January 2023. Out of 110 patients, 56 patients were diagnosed with fibroadenoma, 29 patients were malignant breast tumours, 17 patients had mastalgia, and only 20 patients diagnosed breast abscess on clinical and USG findings. <sup>[Fig.2]</sup> In our study patients with age group 30-60yrs were considered in our study, and patients who had history of smoking, DM, HIV, Malignant tumours, Abscesses secondary to surgical wound infection were in exclusion criteria. <sup>[Fig-1]</sup> The present study was conducted on 20 female patients with provisional diagnosis of breast abscess on clinical basis with an aim to study the bacteriological profile i.e. aerobic and anaerobic bacteria, management of breast abscess and to compare the results of our present study with other relevant studies and to see whether breast abscess is more common in lactating or non-lactating females. The diagnosis of breast abscess was made based on clinical signs and symptoms of infection. The case presenting with features of suppuration during phase of lactation was labelled as lactational breast abscess (Group-A) while others were classified as non-lactational breast abscess (Group-B). These patients were also sub-categorized as acute or chronic based upon their history and clinical presentation. A detailed history including economic status and menopausal history was recorded. Details of local examination were also documented. Note was also made of any associated medical disorder at the time of presentation. Routine and biochemical tests were carried out. Pus was sent for culture.

**RESULT**

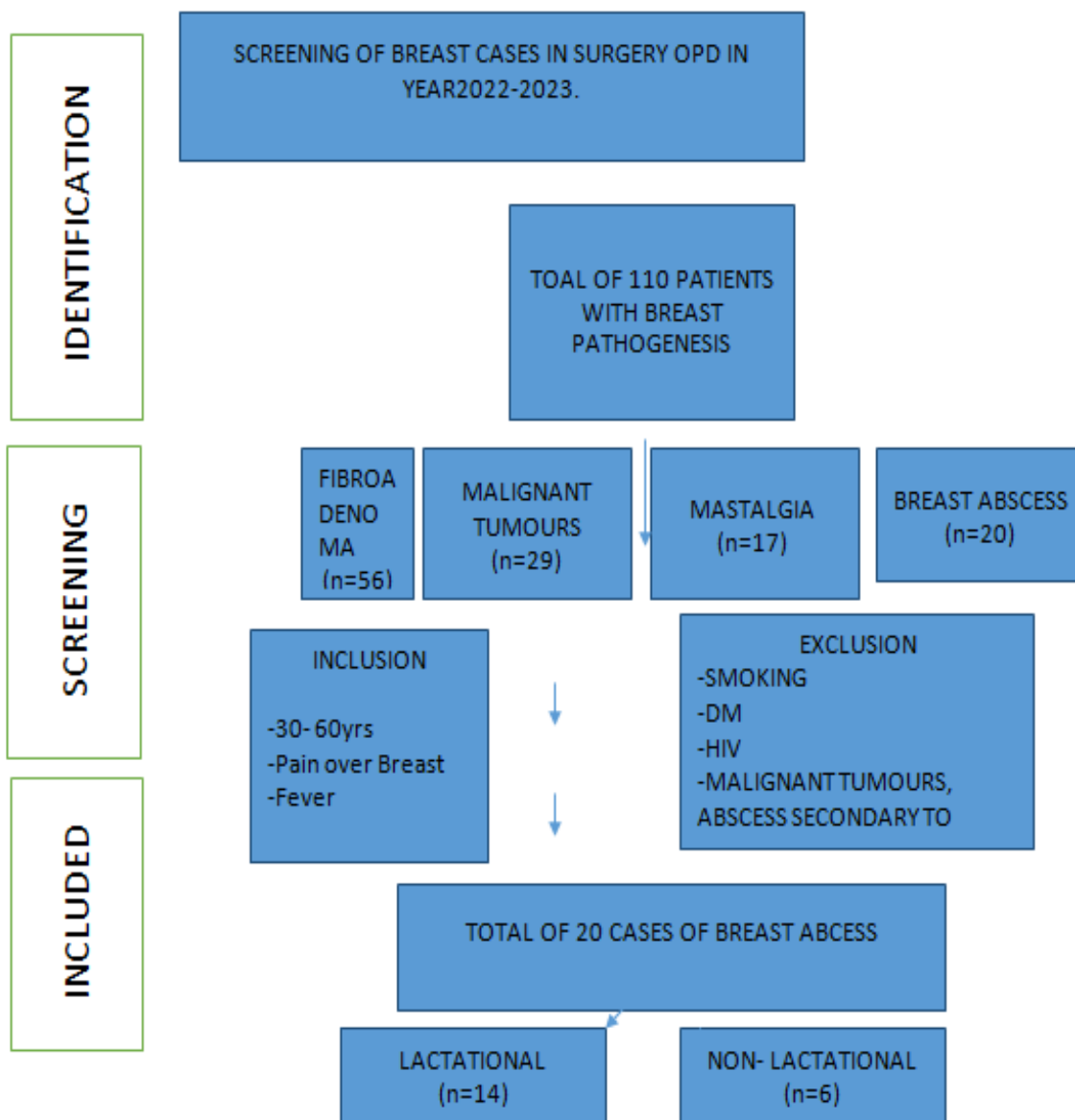
**CLINICAL & PATHOLOGICAL RESULTS**

In our study as we had seen there was 110 patients who presented with breast pathology out of which only 20 had breast abscess. In these 20 patients we had further 14 lactational patients and 6 where non lactational. We had also seen in our study no patient had lesions in the nipple/areolar complex areas, whereas in other studies they had reported they had seen. [35]No patients reported with fever in our study. In non-lactational breast abscess; 04 patients had aerobic growth, 02 patient had anaerobes, on other hand lactational breast abscesses only showed 2 types of aerobic bacteria (Staphylococcus aureus, Staphylococcus epidermidis) (Table-1). In which 12 patients (lactating) had aerobic

growth, whereas in anaerobic there was 04 patients, total there was 16 patients for aerobic, there was 02 patients (lactating) and 2 (non lactating) total of 04 patients where there in anaerobic group (Table-2). In our study most common age group in lactating and non-lactating group was 30-35 years there was 16 patients, whereas in age group 45-50 years 02 patients were there and 02 patients in 50-55 years (Table-3).

**RISK FACTORS**

We had seen in other studies patients with risk factors had higher chance of breast abscess specially with DM and cracked nipple or lesions in areolar complex, but in our study no patient had any lesion and no patient was diabetic. Even no patient had history of trauma.



**TABLE: 1 BACTERIA SPECTRUM IN CASES**

TYPE OF GROWTH	ORGANISM	GROUP -A PATIENTS	GROUP-B PATIENTS
<b>AEROBIC</b>	Staph. Aureus	8	2
	Staph. Epidermidis	4	2
	Strepto. pyogenes	-	-
	E.coli	-	-
	Proteus species	-	-
	Pseudomonas aeruginosa	-	-
	<b>TOTAL</b>	<b>12(60%)</b>	<b>4(20%)</b>
<b>ANAEROBIC</b>	Peptostreptococcus sp.	2	2
	Bacteroid sp.	-	-
	<b>TOTAL</b>	<b>2(10%)</b>	<b>2(10%)</b>

**TABLE: 2**

Organism	Aerobic	Anaerobic
Total	12(GROUP-A) +4 (GROUP-B)=16(80%)	2(GROUP-A) + 2 (GROUP-B =4(20%)

**TABLE -3**

TYPE OF GROWTH	ORGANISM	GROUP -A PATIENTS	AGE	GROUP-B PATIENTS	AGE
<b>Aerobic</b>	Staph. Aureus	8	30-35 years	2	45-50 years
	Staph. Epidermidis	4	30-35 years	2	50-55 years
	Strepto. pyogenes	-		-	
	E.coli	-		-	
	Proteus species	-		-	
	Pseudomonas aeruginosa	-		-	
	<b>TOTAL</b>	<b>12</b>		<b>4</b>	
<b>ANAEROBIC</b>	Peptostreptococcus sp.	2	30-35 years	2	30-35 years
	Bacteroid sp.	-		-	
	<b>TOTAL</b>	<b>2</b>		<b>2</b>	



**DISCUSSION:** The present study was carried out on 20 patients of breast abscess, both lactational and non-lactational. The abscesses were drained by incision and drainage. Patients suffering from the benign / malignant diseases of breast or with co-morbidity (DM, HTN, serology positive) were excluded from the present study. Although the concept of breast abscess as disease of young, but in our study the maximum number of cases 80% were reported in females belonging to age groups between 30 to 35 years while 10% were between the age groups of 45-50 years and 10% fell in the age group of 50-55 years. We also noticed in our study no patient had history of fever. But in many other studies it was reported fever was common presentation. This observation is closely supported by a study done in 1973 which also reported maximum incidence of this condition in 4<sup>th</sup> decade followed by 3<sup>rd</sup> and 5<sup>th</sup> decade. Average age of patients with breast abscess in our study was 38.82 years. This closely approximates with findings of a study done in 1994 which report average age to be 37.6 and 36 years respectively. [9] In our study the disease was more common in housewives (80%) than in working women (20%). This can be explained from the fact that a large number of our patients are from rural background. Patients have less awareness of personal health and health care facilities which can be a cause of high incidence of this condition among housewives especially during postpartum period. The condition of breast abscess in our study was more commonly seen in poorer patients i.e. 64% than in upper and middle class combined i.e. 34%. Premenopausal women comprised the major group (70%) followed by post-menopausal (30%). The reason for this can be attributed to the fact that lactational breast abscess mainly affects young females in post-partum period which comprises a major chunk of pre-menopausal cases in our study. In this retrospective study, *S. aureus* was the most common agent in breast abscesses in breast-feeding women and 30-35 years was the most common age group. There are only two studies that have been carried out in Spain on the microbiology of non-puerperal breast abscesses, both by the same group of researchers and both published in 1995. [19,20] These studies, which partially overlap, include patients with surgical infections and primary breast abscesses without disaggregating the results, so it is difficult to compare their results with those of our study. The lower proportion of anaerobes found in these studies may be due to the studies' inclusion of patients with abscesses secondary to surgery. [19,20] Our study has demonstrated the importance of anaerobic bacteria in abscesses not associated with breast-feeding. Previous studies have also found an association between smoking and the presence of anaerobes in breast abscesses. [18,23]

In our study, we found anaerobic in 10% of abscesses in patients who were not breast-feeding. Examination of the literature reveals that the proportion of primary breast abscesses with anaerobes ranges from 44% to 93% in publications that state that anaerobic culture has been performed. [13-16] In contrast, the percentage of abscesses with anaerobes varies between 25% and 42% in studies that do not claim to have performed anaerobic culture of all samples. [18,21,24,27,29] This difference underscores the importance of adequate microbiological documentation in studies on the aetiology of these infections. With regards to the most relevant anaerobic species, the significance of *Fingoldia magna* and the absence of *Bacteroides* striking, which is consistent with previously published results. [33] Although our study does not include any diabetic patients, the results suggest that breast abscesses in these patients have a differentiated microbiology, with a lower presence of anaerobes. There is no description in the literature of a primary breast abscess due to coagulase-negative *Staphylococcus*, other than *S. lugdunensis*, for which case the criteria used to give it clinical significance are explained. Coagulase-negative *Staphylococcus* appear in many publications in the list of isolated microorganisms and are among the most common in some studies, [16,17,22,28,29] but without an explanation of the criteria that have been followed to give them clinical significance.

In a proven case of primary breast abscess due to coagulase-negative *Staphylococcus*, the species was not determined. [34] In a study it also reported history of mastitis with a previous child (odds ratio =4.0, 95% CI:2.64,6.11), cracks and nipple sores in the same week as mastitis (OR =3.4, 95% CI:2.04,5.51) using an antifungal nipple cream (presumably for nipple thrush) in the same 3-week interval as mastitis. [37] Our results indicate that *S. epidermidis* can cause primary breast abscesses, although this is not common.

#### LIMITATIONS TO THIS STUDY

1. Sample size was small.
2. Follow up was only one year.

**WHY THIS STUDY IS IMPORTANT :** There has been number of studies addressing about treatment and prevention of breastfeeding. After retrospective analysis and taking history we could conclude even patients not having risk factors (DM/HTN/HIV/Smoking) had breast abscess due to lack of knowledge about breast feeding, as we had seen 80% of patients were housewife who were not educated properly about breastfeeding. Patients did not used to empty breast properly, used to feed after hrs (longer gap of breast feeding) increasing breastfeeding duration, visiting to doctor late had they would had visited at initial presentation of abscess or pain over breast it could have been managed

conservatively. Therefore, special emphasis should be made if milk stasis is suspected USG should be performed on immediate basis and treatment should be started.<sup>[36]</sup>

### WHAT'S IMPORTANT FOR BREAST ABSCESS MANAGEMENT IN DEVELOPING COUNTRIES

After detailed history and retrospective analysis, we evaluated that proper counselling and training of mother's and family members for breastfeeding should be done before discharge, also we saw even in absence of comorbid conditions patients were developing breast abscess, therefore proper education will decrease incidence of breast abscess.

### CONCLUSION

Thus to conclude breast abscesses in significant number of cases (80%) with aerobic bacteria especially *Staphylococcus* species being predominant isolate in both lactating and non-lactating patients. However non-lactating breast abscesses besides aerobes also showed presence of anaerobic bacteria. So, by this study it seems that bacteria, aerobic as well as anaerobic, play an important role in pathogenesis of this condition. So, antibiotic therapy should be recommended to all the patients undergoing drainage of these abscesses irrespective of the lactational status. Most of the cases were reported in age group 30-35 years. Therefore, proper breastfeeding training and counselling of mothers should be done how to feed and how to empty breast for mothers who are not breastfeeding, to avoid breast abscess also in our study no suction catheter or corrugated drain was placed all wound were left open and allowed to heal. In last one year we had not reported any recurrence of breast abscess who had been operated (I & D) or managed conservatively. It is also our duty to motivate mother and relatives that they should not cease breastfeeding too early if so it may worsen the symptoms.

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