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LACTATIONAL MASTITIS, EARLY DETECTION AND MANAGEMENT

Nerella Vasumathi Sai Lakshmisri[1], Prerana Raju Gudimetla[2], Pasam Sai Teja Sree[3], Punyapu Sridhar[4], Reena Faith M[5], Sri Keerthi T[6]

[1,2,3]*Assistant Professor, Department of General Surgery, Kamineni Academy of Medical Science and Research centre, LB Nagar, Hyderabad, Telangana, India.*

[4]*Professor &HOD, Department of General Surgery, Kamineni Academy of Medical Science and Research centre, LB Nagar, Hyderabad, Telangana, India.*

[5,6]*Junior Resident, Department of General Surgery, Kamineni Academy of Medical Science and Research centre, LB Nagar, Hyderabad, Telangana, India.*

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CorrespondingAuthor:
Dr. Nerella Vasumathi Sai Lakshmisri,
Assistant Professor, Department of General Surgery, Kamineni Academy of Medical Science and Research centre, LB Nagar, Hyderabad, Telangana, India.
Email:nvasumathi@rocketmail.com

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ABSTRACT

Background: Lactational mastitis is a common inflammatory condition affecting breastfeeding women, particularly during the first few weeks postpartum. It is characterized by breast pain, swelling, erythema, fever, and systemic symptoms, which can interfere with successful breastfeeding and maternal well-being. Delayed diagnosis and inadequate treatment may result in breast abscess formation, premature cessation of breastfeeding, and increased maternal morbidity. Early detection through prompt recognition of symptoms and timely management can improve clinical outcomes, preserve breastfeeding, and reduce complications. **Aim& Objectives:** To study the Prevalence, early detection and the management of mastitis in lactating women attending this hospital.

Objectives:

1. To study the Prevalence of mastitis in lactating mothers.
2. To study the clinical and radiological correlation in early detection.
3. To plan early and appropriate intervention methods of treatment.

Materials and Methods: This study was undertaken mainly to evaluate the prevalence, early detection and management of mastitis in lactating women. The present study is a prospective observational, undertaken in the Department of General Surgery, Kamineni Academy of Medical Sciences and Research Centre, Hyderabad, Telangana, during the period of, November 2020 to October 2022, a total period of 2years.Detailed demographic, obstetric, breastfeeding, and clinical data will be collected using a structured proforma. Diagnosis will be based on clinical examination, with breast ultrasonography and Pus culture performed when indicated. Patients will receive standard treatment, including continued breastfeeding, breast emptying, analgesics, antibiotics where appropriate, and supportive care. Clinical response, duration of symptoms, need for surgical intervention, development of breast abscess, and continuation of breastfeeding will be evaluated during follow-up.

Results: Patients presenting with symptoms and signs of lactational mastitis were examined clinically and subjected to USG Breast examination. Past history of mastitis was noticed only in 6 patients out of which only 2 who underwent incision and drainage had recurrence again. Mastitis was diagnosed clinically in about 46 patients. Mastitis with abscess was clinically diagnosed in 6 patients. Radiologically another 4 patients were diagnosed with abscess. Patients were subjected to different modes of management. Majority of the patients were subjected to oral antibiotics alone and cured well. About 13% of patients required intravenous antibiotics and surgical drainage of pus. About 5

% were treated with intravenous antibiotics and aspiration of pus. This emphasizes that majority of the patients required oral antibiotics alone for the treatment and recovered well. The main causative organism found in the culture and sensitivity reports was Staphylococcus aureus which states that the normal skin flora can be a causative factor. Appropriate antibiotic therapy based on clinical judgment and microbiological findings is anticipated to improve treatment outcomes while minimizing unnecessary antibiotic use.

Conclusion: Early detection and evidence-based management of lactational mastitis are essential for preventing complications and promoting successful breastfeeding. Increasing awareness among healthcare providers and lactating mothers regarding early symptoms, proper breastfeeding techniques, and timely medical consultation can significantly reduce maternal morbidity and improve neonatal nutrition.

Keywords: Lactational mastitis, breastfeeding, early detection, breast abscess, postpartum, antibiotics, breast infection, maternal health.

INTRODUCTION

Mastitis is an inflammatory condition of the breast that may be accompanied by infection. Breast infection during breastfeeding is a common phenomenon that requires immediate and appropriate treatment. Inflammation leads to cessation of breastfeeding resulting in abscess formation.[1]

Lactational mastitis is characterized by a focal, firm, erythematous, swollen, and painful area of one breast, plus a fever (higher than or equal to 100.4 degrees Fahrenheit). Patients often experience systemic symptoms such as chills, myalgias, and malaise.[2]

Lactational mastitis is common, affecting one in 5 breastfeeding women.It is most common in the first 6 weeks of breastfeeding with the highest incidence occurring in the second and third week.[3]

Lactational mastitis is an acute inflammatory process of affected mammary duct and peripheral connective tissue by pathogenic bacteria, which is clinically characterized by a red, hot, swollen and wedge-shaped area of the breast with influenza-like symptoms, such as fever and malaise.[4]

Two modes of infection, firstly involving the parenchymatousbreast tissues which may lead to cellulitis. The lacteal system remains unaffected. Secondly, infection gains access through the lactiferous duct leading to development of primary mammary adenitis. Almost always from nursing infant's nose and throat, the organism enters the breast through the nipple at the site of a fissure or abrasion.[5]

The most acceptable disease process involved is due to insufficient removal of breast milk leading to milk stasis.Fissured or painful nipples are often found in association with mastitis and can be a portal of entry for infection.

Early diagnosis and treatment are needed, since persistence of mastitis can result in breast abscess and sepsis.Management of mastitis mainly depends on its stage.Different modalities involved are antibiotics, aspiration and incision and drainage.

It is recommended to educate the mothers and the family on the exclusive breast feeding practice and its benefits, thereby ensuring there is no stasis of milk and also stress the importance of hygienic feeding practices.Optimal positioning and attachment of the baby, to provide adequate emotional support and access to skilled help in the early postpartum period are the other key factors.[5-8]

Aims and objectives

Aim

To study the prevalence, early detection and the management of mastitis in lactating women attending this hospital.

Objectives

1. To study the Prevalence of mastitis in lactating mothers.
2. To study the clinical and radiological correlation in early detection.
3. To plan early and appropriate intervention methods of treatment.

MATERIALSANDMETHODS

This study was undertaken mainly to evaluate the prevalence, early detection and management of mastitis in lactating women. The present study is a prospective observational study, undertaken in the Department of General Surgery, Kamineni Academy of Medical Sciences and Research Centre, Hyderabad, Telangana, during the period of November 2020 to October 2022, a total period of 2years.

Place of study: Kamineni Academy of Medical Sciences and Research Centre.

Study design: Prospective Observational study.

Sample Size: 50

Study Period: November 2020 to October2022.

Inclusion Criteria

- All postnatal and lactating women.

Exclusion Criteria

- Patients with underlying cutaneous infections of breast
- Breast malignancy patients

- After getting approval from the institutional ethics committee and prior informed consent from the patients the study will be conducted.
- A detailed history of the lactating mothers is made regarding the signs and symptoms.Examination of the breast is done and mothers are subjected for radiological interpretation-Ultrasound of the breast.
- To plan early and appropriate intervention methods of treatment and thereby decrease morbidity
- Depending on the clinical and radiological evaluation mothers are subjected for different modes of treatment-Incision and drainage or Aspiration
- Follow-up of the mothers is done upto 6 months.

RESULTS

Age

In our study, among patients with lactational mastitis 37 people were in between the age group of 20-30.15 patients were in age group of 30-40

Table1: Distribution of patients based on age group

AGE	N=52	%
20-30	37	71.10%
31-40	15	28.80%

SIDE:

In this study side wise distribution among patients with lactational mastitis was 50%(25) patients on right side and 50%(25) patients on left side.

Table 2: Side wise distribution of lactational mastitis

SIDE INVOLVED	N=52	%
RIGHT	26	50%
LEFT	26	50%

MODE OF DELIVERY:

In this study, mode of delivery and incidence of lactational mastitis among them is depicted as 42.3% (22) patients who underwent full term normal vaginal delivery showed mastitis,57.6% (30) patients who underwent caesarean section developed lactational mastitis.

Table 3: Depicting the mode of delivery and incidence of mastitis

TYPE OF DELIVERY	N=52	%
FTNVD	22	42.3
LSCS	30	57.6

PARITY:

In this present study, number of patients with lactational mastitis who were primiparous where 59.6%(31), number of patients with lactational mastitis who were multiparous where 40.3% (21).

Table 4: Showing distribution of lactational mastitis based on parity

	N=52	%
PRIMIPARA	31	59.6%
MULTIPARA	21	40.3%

SYMPTOMATOLOGY:

In this present study of lactational mastitis, about 90.3% (47) patients had lump as symptom,98%(51) patients had pain as symptom,67.3% (35) patients had fever,38.4%(20) patients had skin changes,23% (12) patients had nipple discharge as the presenting complaint.

Table 5: Depicting the symptomatology involved in lactational mastitis

SYMPTOMS	N=52	%
LUMP	47	90.3%
PAIN	51	98%
FEVER	35	67.3%
SKIN CHANGES	20	38.4%
NIPPLE DISCHARGE	12	23%

SIGNS

In our study among lactational mastitis, about 88.40% (46) patients had erythema,44.2%(23) patients had nipple changes(Retracted nipple or cracked nipple),90.30% (47) patients had breast lump,28.80%(15) patients had local rise of temperature,100%(52) patients had tenderness,11.50%(6) patients had skin edema,86.50%(45) patients had breast engorgement and 11.50%(6) patients had clinically abscess.

Table 6: Distribution of signs involved in lactational mastitis

	N=52	%
ERYTHEMA	46	88.40%
NIPPLE CHANGES	23	44.2%
BREAST LUMP	47	90.30%
LOCAL RISE OF TEMPERATURE	15	28.80%
TENDERNESS	52	100%
SKIN EDEMA	6	11.50%
BREAST ENGORGEMENT	45	86.50%
ABSCESS	6	11.50%

PAST HISTORY

In this study patient with past history of mastitis was seen in total 6 patients, out of which 2 of them were managed conservatively and 2 had history of incision and drainage of mastitis.

Table 7: Past history

	N=52	%
PAST HISTORY OF MASTITIS TREATED CONSERVATIVELY	4	7.6%
PAST HISTORY OF MASTITIS TREATED WITH INCISION AND DRAINAGE	2	3.8%
NO PAST HISTORY	46	88.4%

PREDISPOSING FACTORS:

In our study, the correlation between the risk factor involved in lactational mastitis and the incidence of mastitis in patient with risk factor is shown as:

Breast engorgement was found to be associated in about 86.5% (45) patients, <6 months of breast feeding mothers had incidence of 65.3%(34) patients, primiparous mothers were about 59.6%(31) patients, On demand breastfeedingwas seen in 57.6%(30) patients, periodical breastfeeding was seen in 42.3%(22) patients, multiparous mothers were about 40.3% (21) patients, >6 months of breast feeding mothers had incidence of 34.6% (18) patients, Retracted nipple was seen in 23%(12) patients and cracked nipple was seen in 19.2% (10) patients.

Table 8: Distirbution of patients of lactational mastitis based on predisposing factors present

	N=52	%
PRIMIPARA	31	59.6%
MULTIPARA	21	40.3%
CRACKED NIPPLE	10	19.2%
RETRACTED NIPPLE	12	23%
BREAST ENGORGEMENT	45	86.5%
ON DEMAND BREASTFEEDING	30	57.6%
PERIODICALLY BREASTFEEDING	22	42.3%
<6 MONTHS OF BREASTFEEDING	34	65.3%
>6 MONTHS OF BREASTFEEDING	18	34.6%
PREVIOUS HISTORY OF I AND D	2	3.8%

RADIOLOGICAL FINDINGS:

In our study of lactational mastitis, ultrasound breast showed subcutaneous edema was seen in 30.7%(16) patients, subcutaneous edema with dilated ducts were seen in 38.4%(20) patients, subcutaneous edema with dilated ducts and galactocele were seen in 9.6% (5) patients, subcutaneous edema with dilated ducts, galactocele,abscess were seen in 7.60% (4) patients, subcutaneous edema with dilated ducts and abscess were seen in 11.50% (6) patients, subcutaneous edema with gaalctocele is seen in 1.9% (1) patient.

Table 9: Depicting the ultrasound findings in lactational mastitis

	N=52	%
SUBCUTANEOUS EDEMA	16	30.70%
SUBCUTANEOUS EDEMA+DILATED DUCTS	20	38.40%
SUBCUTANEOUS EDEMA+DILATED DUCTS+GALACTOCELE	5	9.60%
SUBCUTANEOUS EDEMA+DILATED DUCTS+GALACTOCELE+ABSCESS	4	7.60%
SUBCUTANEOUS EDEMA+DILATED DUCTS+ABSCESS	6	11.50%
SUBCUTANEOUS EDEMA+GALACTOCELE	1	1.90%

CLINICAL DIAGNOSIS:

In our study about 88.4% (46) patients were diagnosed clinically with lactational mastitis, 11.5% (6) patients were diagnosed with lactational mastitis with abscess.

Table 10: Showing distribution of patients based on clinical diagnosis

CLINICAL DIAGNOSIS	N=52	%
MASTITIS	46	88.4%
MASTITIS WITH ABSCESS	6	11.5%

CLINICAL DIAGNOSIS AND RADIOLOGICAL CORRELATION:

In this study of lactational mastitis the correlation between the clinical diagnosis and radiological interpretation was done. Mastitis was diagnosed clinically in about 46 patients and mastitis with abscess was diagnosed in 6 patients.

3.8% (2) patients had clinical diagnosis of mastitis but radiologically showed abscess.

3.8% (2) patients had clinical diagnosis of mastitis but radiologically showed galactocele with abscess.

Table 11: Clinical and radiological correlation in lactational mastitis

CLINICAL DIAGNOSIS	RADIOLOGICAL INTERPRETATION	N=52	%
MASTITIS	SUBCUTANEOUS EDEMA	16	30.70%
MASTITIS	SUBCUTANEOUS EDEMA,DILATED DUCTS	19	36.50%
MASTITIS	SUBCUTANEOUS EDEMA,DILATEDDUCTS,GALACTOCELE	5	9.60%
MASTITIS	SUBCUTANEOUS EDEMA,DILATEDDUCTS,ABSCESS	2	3.80%
MASTITIS WITH ABSCESS	SUBCUTANEOUS EDEMA,DILATEDDUCTS,ABSCESS	4	7.60%
MASTITIS WITH ABSCESS	SUBCUTANEOUS EDEMA,DILATEDDUCTS,GALACTOCELE,ABSCESS	2	3.80%
MASTITIS	SUBCUTANEOUS EDEMA, DILATED DUCTS, GALACTOCELE, ABSCESS	2	3.80%

MANAGEMENT:

In this study about 80.7% (42) patients were managed on oral antibiotics, 5.76%(3) patients were managed with IV antibiotics with Aspiration of pus, 13.4% (7) patients were managed with IV antibiotics with surgery-Incision and drainage of pus.

Table 12: Distribution of patients based on management involved

	N=52	%
ORAL ANTIBIOTICS	42	80.70%
IV ANTIBIOTICS+ASPIRATION	3	5.76%
IV ANTIBIOTICS+INCISION AND DRAINAGE	7	13.4%

CULTURE AND SENSITIVITY REPORTS:

In this study of 52 patients, Pus for culture and sensitivity were sent for 10 patients which showed coagulase negative staphylococcus aureus in 30% cases(3/10), MRSA in 10% (1/10) cases, 60% (6/10) cases.

Table 13: Showing the distribution of patients based on culture and sensivity reports

	N=10	%
COAGULASE NEGATIVE STAPHYLOCOCCUS AUREUS	3	30%
METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS	1	10%
STAPHYLOCOCCUS AUREUS	6	60%

DISCUSSION

Mastitis is broadly defined as the inflammation of the mammary gland; however, the concept of mastitis is customized to address its social and clinical impact in humans and the health, welfare, and economic consequences for other mammals.

The present discussion will summarize the prevalence, predisposing factors, early detection and management of mastitis in lactating women.

SIDE: In our study side wise predisposition was equal in both sides of breast for development of lactational mastitis.

Mode of Delivery

In this study incidence of lactational mastitis among patients who underwent full term normal vaginal delivery was 42.3% (22) patients, 57.6% (30) patients who underwent caesarean section.

This was similar to the study done by Aarti Jeenwal et al9 which showed incidence of lactational mastitis in caesarean delivery was 12.04% (27/228) patients and in vaginal delivery was 4.14% (18/447) cases wherein mastitis occured more in patients delivered by caesarean section.

In a study conducted by Rama Dutta et al.[5] Out of 2084 vaginally delivered patients, 100 patients developed puerperal lactational mastitis, the

incidence was 4.8%. Out of 1033 patients, who underwent cesarean section, 60 patients developed puerperal lactational mastitis, the incidence was 5.8% which showed mastitis in affected mothers was more in caesarean section.

This was similar to study conducted by Khanal et Al.[10] Which showed higher incidence of mastitis in mothers who underwent caesarean section due to prelacteal feeds to their infants.

PAST HISTORY:

In this study patients with past history of mastitis was seen in total 6 patients, out of which 4 of them were managed conservatively and 2 had history of incision and drainage of mastitis.

In contrast to the study conducted by Scott J A et al,[11]in2004-2005, Scottish population with 18% suffered from mastitis at least once.

SYMPTOMATOLOGY OF LACTATIONAL MASTITIS:

In this present study of lactational mastitis, about 90.3% (47) patients had lump as symptom,98%(51) patients had pain as symptom,67.3% (35) patients had fever,38.4%(20) patients had skin changes,23% (12) patients had nipple discharge as the presenting complaint wherein pain was the most common symptom.

This was similar to study conducted by Betsy Foxman et al12. showedthe most common mastitis symptoms were breast tenderness (98 percent), fever (82 percent), malaise (87 percent), chills (78 percent), redness (78 percent), and a hot spot (a localized area of warmth and tenderness on the affected breast) (62 percent).

PREDISPOSING FACTORS:

INCIDENCE OF MASTITIS POSTPARTUM:

In our study it was observed that incidence of lactational mastitis was seen more in the first 6 months of breastfeeding (65.3%=34 people).

This was similar to the study conducted by Scott et al,[11]which reported an incidence of 18% among a Scottish cohort, of which 53% of the cases (30 of 57) occurred in the first 4 weeks postpartum. Similarly, study conducted by Amir et al13. reported a 17.3% (n = 1,193) cumulative incidence in the first 6 weeks postpartum, of which 53% of cases occurred in the first 4 weeks.

NIPPLES:

In our study retracted nipples were seen in 23% (12) of mothers, cracked nipples were seen in 19.2% (10) of mothers. This differs from study done by Ruma dutta et al.[5] where it showed retractednipple in 13% (21/160), cracked nipple in 44%(70/160) patients.

PARITY:

In this present study, number of patients with lactational mastitis who were primiparous where 59.6%(31),number of patients with lactational mastitis who were multiparous where 40.3% (21).

This was similar to the study done by Rama Dutta et al,[5] which showed among the 160 puerperal lactational mastitis patients, primipara were 91(57%) and multipara were 69 (43%) wherein incidence of lactational mastitis was more in primiparous women.This study is similar to Viduedo AFS et al,[14] reported higher percentage (64%) of severe lactational mastitis among young primiparous women

BREAST ENGORGEMENT:

In our study, Breast engorgement was found to be associated in about (86.5%) 45patients compared to other predisposing factors.This was similar to the study done by Rama Dutta et al,[5] which showed breast engorgement as risk factor in about 75%(120/160) of patients.

INCIDENCE OF BREAST ABSCESS:

In our study about 88.4% (46) patients were diagnosed clinically with lactational mastitis, 11.5% (6) patients were diagnosed with lactational mastitis with abscess.

This was similar to the study conducted by Cenap et al. which showed incidence of breast abscess as 20%.In contrast to the study conducted by Viduedo AFS et al,[14] of the 114 women who were hospitalized for the treatment of lactational mastitis, 62 (54.4%) had a breast abscess on admission

MANAGEMENT OF LACTATIONAL MASTITIS:

In this study about 80.7%(42) patients were managed on oral antibiotics, 5.76%(3) patients were managed with IV antibiotics with Aspiration of pus, 13.4% (7) patients were managed with IV antibiotics with surgery-Incision and drainage of pus. In contrast to the study done by Rama Dutta et al,[5] out of 127 patients 59.84% underwent I & D, 3.14% underwent aspiration, 37% received only antibiotics.

CULTURE AND SENSITIVITY:

In this study of 52 patients,Pus for culture and sensitivity were sent for 10 patients which showed coagulase negative staphylococcus aureus in 30% cases(3/10), MRSA in 10% (1/10) cases, 60% (6/10) cases.This was similar to the study done by Rama Dutta et al,[5]which showed Breast milk culture report of mastitis yielded growth of Staphylococcus aureus in 120 (75%) patients and MRSA (Methicillin resistance Staphylococcus aureus) in 40(25%) patients.

In the study conducted by Ramakrishnan R et al,[15] it showed in lactational breast abscess, Staphylococcus aureus (84%) was the most common organism in study, but no cases showed MRSA.

In contrast, studies bySaharan, et al,[16] found MRSA in (63% and 23% respectively) breast abscess patients.

CONCLUSION

The present study concluded that Early detection and evidence-based management of lactational mastitis are essential for preventing complications and promoting successful breastfeeding. Increasing awareness among healthcare providers and lactating mothers regarding early symptoms, proper breastfeeding techniques, and timely medical

consultation can significantly reduce maternal morbidity and improve neonatal nutrition.

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REFERENCES

1. Pevzner M, Dahan A. Mastitis While Breastfeeding: Prevention, the Importance of Proper Treatment, and Potential Complications. J Clin Med. 2020 Jul 22;9(8):2328. doi: 10.3390/jcm9082328. PMID: 32707832; PMCID: PMC7465810.
2. Blackmon MM, Nguyen H, Mukherji P. Acute Mastitis. 2022 Jul 18. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan–. PMID: 32491714.
3. Cusack L, Brennan M. Lactational mastitis and breast abscess - diagnosis and management in general practice. Aust Fam Physician. 2011 Dec;40(12):976-9. PMID: 22146325.
4. Tang L, Lee AH, Qiu L, Binns CW. Mastitis in Chinese breastfeeding mothers: a prospective cohort study. Breastfeeding Medicine : the Official Journal of the Academy of Breastfeeding Medicine. 2014 Jan-Feb;9(1):35-38. DOI: 10.1089/bfm.2013.0032. PMID: 23786309.
5. Dutta, Ruma & Gowder, Ravikanth. (2018). The prevalence and predisposing factors of mastitis in lactating mothers in puerperium. The New Indian Journal of OBGYN. 5. 28-32. 10.21276/obgyn.2018.5.1.7.
6. Foxman B, D'Arcy H, Gillespie B, et al (2002): Lactation mastitis: Occurrence and medical management among 946 breastfeeding women in the United States.AmericanJournal of management ofEpidemiol155,103-144.
7. WHO (2000)Mastitis. Causes and management. World Health organization.www.who.in.
8. Hager, W.D. and Barton, J.R. (1996) Treatment of sporadic acute puerperal mastitis. Infectious Diseases in Obstetrics and Gynecology4(2), 97-101.
9. Jeenwal, Aarti &Jharbade, Hemlata & Singh, Nishita. (2019). An evaluation of abnormal puerperium. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 8. 1491. 10.18203/2320-1770.ijrcog20191205.
10. Khanal V, Scott JA, Lee AH, Binns CW. Incidence of Mastitis in the Neonatal Period in a Traditional Breastfeeding Society: Results of a Cohort Study. Breastfeed Med. 2015 Dec;10(10):481-7. doi: 10.1089/bfm.2015.0080. Epub 2015 Oct 21. PMID: 26488802; PMCID: PMC5118955.
11. Scott, Jane & Robertson, Michele & Fitzpatrick, Julie & Knight, Christopher & Mulholland, Sally. (2008). Occurrence of lactational mastitis and medical management: A prospective cohort study in Glasgow. International breastfeeding journal. 3. 21. 10.1186/1746-4358-3-21.
12. Betsy Foxman, Hannah D'Arcy, Brenda Gillespie, Janet Kay Bobo, Kendra Schwartz, Lactation Mastitis: Occurrence and Medical Management among 946 Breastfeeding Women in the United States, American Journal of Epidemiology, Volume 155, Issue 2, 15 January 2002, Pages 103-114, https://doi.org/10.1093/aje/155.2.103
13. Amir LH, Forster DA, Lumley J, McLachlan H. A descriptive study of mastitis in Australian breastfeeding women: incidence and determinants. BMC Public Health. 2007 Apr 25;7:62. doi: 10.1186/1471-2458-7-62. PMID: 17456243; PMCID: PMC1868722.
14. Viduedo Ade F, Leite JR, Monteiro JC, dos Reis MC, Gomes-Sponholz FA. Severe lactational mastitis: particularities from admission. Rev Bras Enferm. 2015 Nov-Dec;68(6):1116-21. English, Portuguese. doi: 10.1590/0034-7167.2015680617i. PMID: 26676435.
15. Ramakrishnan, Ramya, Ramakrishnan V. Trichur, Sowmya Murugesan, & Srihari Cattamanchi. "Analysis of the microbial flora in breast abscess: a retrospective cohort study conducted in the emergency department." International Surgery Journal [Online], 4.7 (2017): 2143-2147. Web. 18 Nov. 2022.
16. Saharan, Amandeep & Dalal, S. & Singh, Mahavir & Bhatia, Chisel & Chhabra, Tulit. (2017). Surgery without knife: an ideal treatment for lactational breast abscess. International Surgery Journal. 5. 261. 10.18203/2349-2902.isj20175907.