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RESEARCH ARTICLE

The prevalence and predisposing factors of mastitis in lactating mothers in puerperium

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ABSTRACT

Objectives: To study the prevalence, evaluate the predisposing factors and know the etiological factors associated with mastitis in lactating mothers during puerperium. **Materials and methods**: A prospective study was performed from January 1st, 2014 to December 31st, 2015. Data were collected from patients admitted in the postnatal ward with benign breast problems by preformatted questionnaires. Breast milk cultures were done to evaluate the etiological factors. Data were analyzed by using descriptive statistics. **Results:** The overall prevalence of puerperal mastitis among lactating mothers was 5.1%, high among caesarean section patients (5.8%) compared to vaginally delivered patients (4.8%). The predisposing factors include primipara (57%), unbooked cases (57%), low socioeconomic status (49%), anemic patients (45%), breast engorgement (75%), cracked nipple (44%), retracted/flat/inverted nipple (13%), poor attachment of baby to breast (32%), infrequent removal of milk (7%), oversupply of breast milk (37.5%) and lower supply of breast milk(12.5%). Breast milk culture reports yielded growth of *Staphylococcus aureus* (75%) and MRSA (25%). Seven patients developed breast abscess (4.4%). **Conclusion:** It is recommended to educate the mothers and the family on the exclusive breast feeding practice and its benefits, demand feeding, optimal positioning and attachment of the baby, to provide adequate emotional support and access to skilled help in the early postpartum period.

Keywords: Puerperium, mastitis, lactation.

Mastitis is defined as inflammation of the mammary gland. Mastitis is an acute, debilitating condition that occurs in approximately 20 % of breastfeeding women who experience a red, painful breast with fever [1, 2]. Two mode of infection, firstly involving the parenchymatous breasts 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. In superficial cellulitis, the onset is acute during first 2-4 weeks postpartum. There may be inflammation preceded by engorgement, fever (102°F or more) with chills, tachycardia, flu like symptoms like generalized malaise, headache, nausea, vomiting, sudden onset of intense breast pain. Breast abscess usually occurs as a complication of mastitis [3].

Materials and Methods

This study was conducted among 3117 postnatal

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lactating mothers who had a full term or preterm, vaginal or caesarean delivery at K.V.G medical college & Hospital, Sullia, Karnataka, from January 1st 2014 to December 31st 2015, for a period of six weeks postpartum. Out of 3117 number of delivery, 160 mothers developed mastitis. Data were collected from patients admitted in the postnatal ward with benign breast problems like cracked nipple or sore nipple, breast engorgement, retracted nipple, flat nipple or inverted nipple, poor attachment of baby to the breasts leading to nipple damage, infrequent removal of milk, breast milk amount (normal/low supply/over supply) and breast abscess by preformatted questionnaires and local examination of breasts. Breast milk cultures were done to evaluate the etiological factors. The exclusion criteria of our study were history of mastitis prior to delivery and continued in the postnatal period. Data were analyzed by using descriptive statistics and other appropriate statistical methods.

Results

The overall prevalence of puerperal mastitis in lactating mothers in this study was 5.1%. Out of 2084 vaginally delivered patients, 100 patients developed puerperal lactational mastitis, the incidence was 4.8%.

Table 1: Demographic Data (N=160)

Categories		Number (%)
Booked patients		69(43%)
Unbooked patients		91(57%)
Primipara		91(57%)
Age in years	18-23	45(28%)
	24-30	88(55%)
	>30	27(17%)
Mean age	27 yrs; range 18-36yrs	
Socioeconomic status (According to Kuppuswamy classification)	Upper	13(8%)
	Upper middle	5(3%)
	Lower middle	64(40%)
	Upper lower	78(49%)

Out of 1033 patients, who underwent cesarean section, 60 patients developed puerperal lactational mastitis, the incidence was 5.8%. Among the 160 puerperal lactational mastitis patients, primipara were 91(57%) and multipara were 69 (43%) (Table 1). The mean age of the women was 27 years (Range 18 to 36 years) (Table 1). The distribution of patients who developed puerperal mastitis in relation to period of gestation <37weeks, 37- 40weeks and > 40weeks were 20(12.5%), 130 (81.25%) and 10(6.25%) respectively. In this study, lactational mastitis was found to be more in low socioeconomic status group (49%) and unbooked cases (57%) (Table 1).

The predisposing factors of lactational mastitis in this study was breast engorgement (75%), anemia (45%),

Table 2: Predisposing factors which might lead to puerperal mastitis among lactating mothers (N=160)

Risk factors		No of cases (%)
Primi parity		91(57%)
Low socio-economic status		78(49%)
Anemia		72(45%)
Breast engorgement		120(75%)
Cracked nipple		70(44%)
Retracted nipple		21(13%)
Poor attachment of baby to breast		51(32%)
Infrequent removal of milk		51(32%)
Breast milk amount	Normal	80(50%)
	Over supply	60(37.5%)
	Low supply	20(12.5%)

cracked nipple (44%), poor attachment of baby to the breasts (32%), over supply of breast milk (37.5%) and lower supply of breast milk (12.5%) respectively (Table 2). Out of 72 anemic patients, 13 (8%) had mild, 40 (25%) had moderate and 19 (12%) patients had severe anemia.

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. The prevalence of breast abscess in our study was 4.4% (7/160) (Table 3). In one of the patients with breast abscess, one liter of pus which was drained with radial incision made over the breast. Breast Abscess milk culture yielded growth of *Staphylococcus aureus* and MRSA.

Table 3: Breast milk culture report of patients

Breast milk culture	Mastitis (N=160)	Breast abscess (N=7)
	Number (%)	Number (%)
Staphylococcus aureus	120(75%)	5(71%)
MRSA	40(25%)	2(29%)

Discussion

Mastitis is defined as at least two breast signs or symptoms (pain, redness or lump) and one systemic

symptom (fever or 'flu-like symptoms) present for at least twelve hours [4]. Mastitis is reported to occur in 2-24% of breastfeeding women from several weeks up to one year after delivery in women who continue to breastfeed [5]. It is most common in the first 6 weeks of breastfeeding with the highest incidence occurring during the second and third weeks. It is initially localized to one segment of the breast, but if untreated, can spread to affect the whole breast [6, 7].

We studied 3117 postnatal lactating mothers in puerperium, out of which 160 mothers developed mastitis. The prevalence of mastitis among lactating mothers in the first six weeks of postpartum period in the present study is 5.1%. The prevalence of mastitis varies depending on the definition and the number of weeks postpartum [5]. For example: A community based study among rural women of Rajasthan by Iyengar K reported the incidence of mastitis was 1.3% during first week after delivery [5]. A prospective cohort study conducted in western Nepal reported the incidence of mastitis was 8.0% in the first month postpartum [8]. The CASTLE study, a prospective cohort study which recruited nulliparous women in late pregnancy in two maternity hospitals in Melbourne, Australia reported 20% (70/346) of participants developed mastitis during the first eight weeks postpartum [2]. The incidence rate of 9.5% (n = 946) was reported for a cohort of women followed up for 3 months in the United States [8]. A descriptive study of mastitis in Australian breastfeeding women reported a 6 month incidence rate of 17% (n = 206) of women experienced mastitis, of which 53% cases occurred in first 4 weeks postpartum [1]. A prospective cohort study of mastitis among out of 670 Chinese breastfeeding mothers, 42 women (6.3%) experienced at least one episode of mastitis during the first 6 months after delivery [8, 9]. Scott et al. reported a 6-month incidence of 18% among a Scottish cohort, of which 53% of the cases (30 of 57) occurred in the first 4 weeks postpartum [10]. Vogel et al. reported a 12-month incidence rate of 23.7% (n = 350) among a cohort of women in New Zealand [8]. The lower incidence of puerperal mastitis among lactating mothers in our study could be due to two reasons: firstly, exclusive breastfeeding is universal in our study area and secondly, we collected data only up to six weeks after delivery.

The incidence of lactational mastitis was lower among the vaginal delivery patients (4.8%) compared to patients who underwent cesarean section (5.8%) in our study. Prelacteal feeding and cesarean section were associated with a higher likelihood of mastitis [8]. A negative association between Caesarean delivery and breastfeeding exists because postoperative care routines delay the onset of lactation, disrupt mother infant interaction and inhibit infant suckling [11]. Mothers who had cesarean section were more likely to have problems related to breastfeeding, including nipple fissure, in comparison to women who had vaginal delivery [12, 13]. However, there were no relationships observed between nipple injuries with the type of childbirth in a cohort study conducted in Australia with 340 primiparous women [14].

In our study, mean age was 27 years of age (Range 18 to 36 years). The majority of the women were between 24-30 years (55%). Maternal age is not directly linked to lactational mastitis; however, there is evidence that young women find it more difficult to breastfeed due to insecurity and inexperience. This can lead to difficulty in breastfeeding, culminating in breast problems and consequently in early weaning [15].

In our study, higher percentage of lactational mastitis was found in primiparous women (57%) compared to multiparous women (43%).Our study is similar to Viduedo AFS et al, reported higher percentage (64%) of severe lactational mastitis among young primiparous women [16]. The binational study also reported mastitis more common in primiparous women [17]. Women who never breastfed may be more anxious and, as a result, this may interfere with the breastfeeding process [16].

Out of 160 mastitis patients, 72 women were anemic. According to ICMR classification, 13 patients had mild anemia, 40 patients had moderate anemia and 19 patients had severe anemia. Anemic women might be more vulnerable to infection.

Risk factors that have been suggested to be strongly associated to mastitis include cracked or sore nipples, use of ointments, inappropriate breastfeeding practices, mastitis with a previous child, and peripartum antibiotic therapy [1, 7]. The present study is similar to various other studies, cracked nipple or sore nipple were associated with mastitis under the hypothesis that it provides a portal

of entry for microorganisms [1,2,4,9,18].

Regarding the amount of milk produced, milk over or undersupply versus normal supply that mastitis may arise from a higher milk supply because of the risk of milk stasis, if the infant delays or misses feeds, this situation may provide good conditions for bacterial overgrowth. On the other hand, low milk supply could give to the mother a false perception of low milk production when, actually, only secretion is compromised due to the formation of thick bacterial biofilms inside the milk ducts [1,2,18,19].

The incorrect handling of the infant to the mother's breast and the inadequate positioning between mother and child were associated to nipple trauma. Prevention of nipple damage is likely to reduce the incidence of infectious mastitis. New mothers need good advice about optimal attachment of the baby to the breast and access to skilled help in the early postpartum days and weeks [13, 20, 21].

Breast milk culture report of mastitis yielded growth of *Staphylococcus aureus* in 120 (75%) patients and MRSA in 40(25%) patients. Seven patients with mastitis developed breast abscess, the incidence was 4.4% (7/160) as complication. The literature shows that the incidence of breast abscess in lactating mothers varies between 3% and 11% [6, 18, 24]. In one of the patients with breast abscess, one liter of pus was drained with radial incision made over the breast. Breast Abscess milk culture yielded growth of MRSA and *Staphylococcus aureus*. The most common bacterium found in breast abscess secretion culture was *Staphylococcus aureus*, which coincides with our findings [15, 23-28]. Various other studies also reported MRSA in breast abscess secretion culture which is similar to our study [25, 27]. A lactational breast abscess is usually bacterial in etiology and can be effectively managed with oral antibiotics. All patients in our study received antibiotics based on their sensitivity pattern and were discharged in 3 to 4 days. In addition to antibiotics, management of breast abscess included incision and drainage, symptomatic treatment with analgesia and antipyretics, reassurance, assessment of the infant's breastfeeding technique, education, emotional support, and support for continuous breastfeeding.

Conclusion

It is recommended to educate the mothers and the family on the exclusive breast feeding practice and its benefits, demand feeding, optimal positioning and attachment of the baby, to provide adequate emotional support and access to skilled help in the early postpartum period. Continued breastfeeding should be encouraged in the presence of mastitis which generally does not pose a risk to the infant. Breast abscess is the most common complication of mastitis. It can be prevented by early treatment of mastitis and continued breastfeeding.

Conflict of interest: None. **Disclaimer:** Nil.

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