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Original Research Article

"Incidence of Breast Abscess in Lactating Women-A Randomised Controlled Trial and a Survey Study"

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Abstract: ***Introduction:*** A breast abscess is a localised collection of pus within the breast that usually occurs as a complication of mastitis. Mastitis is an inflammation of breast tissue, which may or may not result from infection. Infective mastitis in lactating women is usually associated with Staphylococcus aureus (S. aureus), an organism which characteristically causes abscess development. ***Objectives:*** To report the incidence of breast abscess in lactating women. ***Materials and Methods*:** A randomised controlled trial and a survey study was carried out Dept. of Surgery, Sheikh Hasina Medical College and Hospital, Tangail, Bangladesh from January 2019 to December 2020. A total of 596 of 656 (91%) primiparous, Bangla-speaking women from a diverse range of backgrounds, including those receiving public clinic care, private care and birth centre care. An interview was conducted on breastfeeding at 24 months postpartum. Main outcome measures: Lactational mastitis and breast abscess. ***Results:*** One hundred and three women experienced mastitis. Three women developed a breast abscess: 0.4% of women who commenced breastfeeding (95% CI 0.14 – 0.98); 2.9% of women who took antibiotics for mastitis (95% CI 1.0– 6.7). ***Conclusion*:** Although many authors estimate that 11% of women with mastitis develop a breast abscess, the incidence of lactating breast abscesses appears to be lower than reported in the past. Our estimate is that 3% of women with mastitis will develop a breast abscess.

Keywords: Incidence, Breast Abscess, Lactating Women, Mastitis.

INTRODUCTION

Lactational breast abscesses are complications of infectious mastitis and are more frequent among primiparous women. It has been estimated that 0.4 and 3% of women with mastitis develop a breast abscess [1]. Breast infection is a common problem in lactating women presenting with a wide spectrum of pathology, ranging from mastitis to abscess formation. Treatment of lactational breast abscess may involve surgical incision and drainage or needle aspiration and antibiotic therapy. Mastitis is an inflammation of breast tissue, which may or may not result from infection [2]. Infective mastitis in lactating women is usually associated with Staphylococcus aureus (S. aureus), [2] an organism which characteristically causes abscess development [3]. A breast abscess is a localised collection of pus within the breast that usually occurs as a complication of mastitis [4]. A breast abscess is defined as a localized accumulation of infected fluid in breast tissue [5]. First-line treatment for most abscesses is currently needle aspiration with antibiotics. Surgical treatment is typically reserved for recurrent or extremely large abscesses. The incidence of breast abscess ranges from 0.4% to 11% [6-8]. The traditional management of breast abscesses involves incision and drainage, but this is associated with prolonged healing time, regular dressings, difficulties in breastfeeding, and the possibility of an unsatisfactory cosmetic outcome [9, 10]. Lactating women and the clinicians caring for them are concerned about the possibility of breast abscesses. As some authors suggest that up to 11% of women with mastitis will develop a breast abscess [11-14] this is a potentially significant health issue. It has recently been reported that breast abscesses can be treated by repeated needle aspirations [15-18]. There are no prospective, randomized studies comparing the effectiveness of this technique and that of incision and drainage of breast abscesses in the literature. The purpose of the present study was to compare the classic incision and drainage method and the novel approach of needle aspiration of breast abscesses in lactating women.

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MATERIALS AND METHODS

A randomised controlled trial and a survey study was carried out Dept. of Surgery, Sheikh Hasina Medical College and Hospital, Tangail, Bangladesh from January 2019 to December 2020. A total of 596 of 656 (91%) primiparous, Bangla-speaking women from a diverse range of backgrounds, including those receiving public clinic care, private care and birth centre care. An interview was conducted on breastfeeding at 24 months postpartum. Main outcome measures: Lactational mastitis and breast abscess.

Inclusion criteria in both studies included prim parity. Two groups of women not included in the randomized controlled trial due to already high breastfeeding rates were recruited to a concurrent breastfeeding survey. Recruited at 36 weeks of gestation and patients from postpartum. A telephone interview at six months postpartum included questions about breastfeeding problems. Women with any symptoms of mastitis since birth (pain, hardness/lumps, and redness of the breast, fever or 'flu-like' symptoms) were asked if they had experienced a breast abscess. If so, further questions about diagnosis and management of the abscess were asked. Stata 8 was used to calculate exact binomial 95% confidence intervals for proportions.

RESULTS

The interview at 24 months postpartum was completed by 445 (91%) of the 490 women enrolled in the randomized controlled trial, and 151 women, 92% of the 166 women recruited for the Survey. 86 women were treated by antibiotics for at least one episode of mastitis (55 in the randomized controlled trial [12.3%], and 31 [20.4%], in the Survey, or 14.5% overall). Three women reported having a breast abscess: four in the randomized controlled trial and one in the Survey. Each had one abscess. Of the 592 women who commenced breast-feeding, 0.4% (3/892) experienced a breast abscess. All three had received antibiotics prior to abscess development, thus 2.9% (3/86) of women who took antibiotics for mastitis experienced a breast abscess. Table 1 lists the investigations, management and out-comes for each woman with a breast abscess. All women had their breast abscess drained by needle aspiration; one also required open drainage. It is considered safe to continue breastfeeding, during and after treatment of an ab-scess1; three of the five women were continuing to breastfeed at six months postpartum.

Table-1: Investigations, management and breastfeeding outcome in women with a breast abscess.

Timing of abscess	Investigation(s)	Management	Outcome
Abscess at 3 weeks following mastitis at 5 days	None	Needle aspiration	Continuing to breastfeed at 6 months
Abscess at 5 weeks associated with mastitis	None	Needle aspiration and open drainage	Stopped breastfeeding at 6 weeks because of mastitis, flat nipples and low milk supply. History of abscesses under arms
Abscess at 7 weeks (had mastitis at 3 weeks—took antibiotics)	Ultrasound, mammogram	Needle aspiration	Stopped breastfeeding at 6 weeks (baby could not suck effectively), thus weaning from breast occurred prior to abscess
Abscess at 8 weeks associated with mastitis	Ultrasound	Needle aspiration	Continuing to breastfeed at 6 months
Abscess after 2nd mastitis at 16 weeks	Ultrasound	Needle aspiration (6 times)	Continuing to breastfeed at 6 months

Table-2: Reported incidence of breast abscess.

Author(s), year of publication	Study population	Rate of breast abscess of women with mastitis	Comments
Devereux 1970[19]	Patients seen by a private obstetrician, 1948 – 1968	15% (8/53)	20 year study; antibiotic prescribed was sulfisoxazole. Has been reported as 11%, which indicates proportion of episodes of mastitis (rather than number of women).
Marshall et al., 1975 [20]	Women attending a maternity hospital with mastitis, 1971 – 1973	4.6% (3/65)	The three breast abscesses occurred in women who had stopped breastfeeding.
Thomsen et al., 1984 [21]	213 women with non-infectious inflammation or infectious mastitis	2.8% (6/213)	Non-infectious mastitis defined as $>10^6$ leucocytes and$<10^6$ bacteria per mL of milk. Infectious mastitis defined as $>10^6$ leucocytes and $>10^6$ bacteria per mL of milk. In practice, these are indistinguishable, and would both present as clinical mastitis.

	165 women with infectious mastitis	3.6% (6/165)	Women with infectious mastitis were randomized to 3 groups: (a) No treatment (n 1⁄4 55) (b) Emptying the breast (n 1⁄4 55) (c) Antibiotics and emptying the breast (n 1⁄4 55)
	55 women with infectious mastitis—Given no treatment (i.e. group 'a' above)	11% (6/55)	The only women who developed an abscess were in the group that received no treatment
Lisa H. Amir *et al*. 2004 [22]	596 women at 6 months postpartum; 171 had mastitis (defined as took antibiotics for mastitis)	2.9% (5/171) (95% CI 1.0 – 6.7)	Of the total population, 5/1193 women giving birth developed a breast abscess 0.4% (95% CI 0.14 – 0.98)
Current cohort, 2021	596 women at 6 months postpartum; 86 had mastitis (defined as took antibiotics for mastitis)	2.9% (3/86) (95% CI 1.0 – 6.7)	Of the total population, 3/596 women giving birth developed a breast abscess 0.4% (95% CI 0.14 – 0.98)

DISCUSSION

This study aimed to estimate the incidence of lactational breast abscess and describe its management by percutaneous aspiration at the SHMCH. Breast abscesses were more common prior to the use of antibiotics. A prospective surveillance study conducted in one town in Scotland, from 1941 to 1943, found that 156 women developed a breast abscess, which was 8.9% of women giving birth (156/1751) [23]. In the 1950s and early 1960s, severe staphylococcal infections occurred world-wide due to the phage 80 'golden staph' [24]. For example, during an outbreak of breast abscesses at Philadelphia General Hospital in late 1954, 16 abscesses occurred in one month [25]. In Edinburgh in 1957, it was estimated that 3% to 4% of all women giving birth developed a breast abscess requiring hospital treatment [26]. Although authors described an apparent fall in the incidence of breast abscesses in lactating women in the 1980s, [27] as recently as 2002, Foxman et al [28] stated that 'abscesses are reported to occur in 11% of all affected women'. However, the 1970 reference cited is a 20-year review of 53 patients seen by a private obstetrician, dating from 1948 [29]. The WHO review of mastitis (2000) concluded that 11% of women with mastitis develop an abscess from the same study, [29] and also quoted 11% for the Thomsen study (when this should be 2.8% of women with clinical mastitis) [30]. Table 2 presents the incidence of breast abscess in developed countries published since 1970. Recently, the risks of nonlactational breast abscess development following nipple piercing have been highlighted [31]. Previously, standard treatment for breast abscesses was incision and drainage, followed by post-operative dressings, but needle aspiration has become more commonly practised. Two large case series (33 and 45 lactational breast abscesses, respectively) have concluded that aspiration is an effective treatment, which is also convenient for the woman and cost effective [32, 33]. Accurate estimates of the proportion of women who develop a breast abscess following mastitis are difficult due to the varied definitions of mastitis used. Estimates that 11% of women with mastitis develop a breast abscess are frequently published [4, 7, 29]. However, the current incidence in developed countries appears to be much lower: our estimate is 3% of women with mastitis will develop a breast abscess. Current management by needle aspiration enables women to recover faster and facilitates continued breastfeeding.

CONCLUSION

Although many authors estimate that 11% of women with mastitis develop a breast abscess, the incidence of lactating breast abscesses appears to be lower than reported in the past. Our estimate is that 3% of women with mastitis will develop a breast abscess.

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