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Treatment of Infectious Mastitis

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PERMISSION

Title

Department Nursing

Degree Master of Science

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Abstract

Mastitis is a complication of breast feeding encountered often by primary care providers. The goal of treating mastitis is not only resolution of the infection, but also the continuation of lactation so that both mother and child may continue to enjoy the innumerable health benefits of breastfeeding. The patient discussed in this case study is a first time mother who is exclusively breastfeeding, but whose planned change in feeding schedules places her at risk for developing mastitis as a result of engorgement or plugged milk ducts. This case report examines current recommendations and evidence for treatment of infectious mastitis. Attention is given to diagnostic criteria, non-pharmacologic and pharmacologic management. Surprisingly, a review of the literature finds provider assessment and support is sometimes limited for breastfeeding mothers facing the challenge of mastitis. Current treatment options are often based on provider preferences as opposed to best practices. Additionally, there is little scientific evidence supporting antibiotic selection resulting in a definite need for further research in this area. These details must be taken into account by the provider to ensure appropriate evidence-based care which is congruent with the needs of the breastfeeding mother.

Treatment of Infectious Mastitis

Breastfeeding and anticipatory guidance for potential feeding complications is a crucial topic to be discussed by clinicians at routine post-partum visits. This is especially true when providing care for first-time mothers who plan to return to work, as was the case of D.G., the clinical model for this case study. While all nursing mothers may be at some risk for impediments to breastfeeding, such as lactational mastitis, those planning to reenter the workforce full time might be more inclined to prematurely wean from nursing should mastitis develop. This would consequently deprive both mother and infant of the many established benefits of breastfeeding. This complication requires prompt recognition and treatment so that breastfeeding can continue without difficulty.

The benefits of breastfeeding are innumerable and well established for both mother and child. The World Health Organization (2014a) notes that sensory and cognitive development are elevated in children who are breastfed and recommends that all children be exclusively breastfed until the age of 6 months. Children who are breastfed not only receive the immune protection of antibodies present in breast milk, but they also recover easier from childhood illnesses, and are less likely to be obese or develop Type 2 diabetes in later life (WHO, 2014b). In addition to positive health outcomes for breastfed infants, mothers who nurse also enjoy lower rates of obesity and return to pre-pregnancy weight easier (WHO, 2014b). Other long term benefits for the mother include a lowered risk for both breast and ovarian cancer (WHO, 2014a).

While breastfeeding is a natural process, it is not without potential complications. Although reported rates vary, mastitis occurs in 2 to 33 percent of women who are lactating (Jahanfar, Ng & Teng, 2013; Spencer, 2008). Unfortunately, the occurrence of mastitis often discourages a nursing mother, and can lead to premature cessation of breastfeeding. Providers who are unfamiliar with mastitis treatment may incorrectly instruct the patient to stop

breastfeeding all together, unnecessarily ending this favorable process. Provider support and guidance in addition to following an appropriate treatment regimen is paramount to successful continuation of lactation following a diagnosis of mastitis. This report will review current treatment recommendations to assist providers when caring for women with a clinical diagnosis of lactational mastitis.

Case Report

Subjective

HPI: MM is a 27 y.o. G2P1 10-week post-partum female who presents for her first post-partum visit. She missed her initial post-partum visit and states she "just spaced it." She delivered a healthy 8 lb 14 oz baby girl, Harper, vaginally at 38 & 3/7 weeks with a MLE. She had gestational diabetes during her pregnancy and denies treatment other than diet and exercise. She was also monitored for Pregnancy Induced Hypertension, but did not need treatment for her blood pressures, which ran 140's/80's according to clinic records. She did not have protein in her urine at any prenatal visit.

She is breastfeeding exclusively every 2-3 hours on demand. She states that Harper nurses equally on both sides for 10-15 minutes. She has not experienced any difficulties or pain with nursing. She states she feels like she is getting adequate amounts of sleep and naps when the baby sleeps during the day. She plans to return to work full time in 2 weeks and will use a home day care for Harper. She is planning to supplement breastfeeding with formula when she returns to work.

Overall she feels things are going well, but reports having some anxiety. State she "just feel(s) a little nervous" and occasionally wakes up wondering if the baby is okay. She feels she may be nearing a panic attack. She has used self-calming measures during these times including breathing techniques and positive self-talk, which were effective.

Allergies: Penicillin

PMH/PSH:

Gestational Diabetes Mellitus
Pregnancy Induced Hypertension
Spontaneous miscarriage

Family Hx:

Mother: Elevated Cholesterol, Lumpectomy- benign
Father: HTN and Type II diabetes.

Social Hx: She is a graphic designer and has been married for 3 years. She is a non-smoker. She is hoping to keep breastfeeding upon return to work. Her husband is a banker. She feels safe at home. They have running water and electricity.

Medications:

None

ROS:

Constitutional: She reports she is feeling "well." Denies fever chills. Sleeping well between nighttime feedings and naps during the day when baby naps.

HEENT: Denies headaches, visual changes, blurred vision. No sinus pressure or congestion, no nasal congestion. Denies sore throat.

Respiratory: Negative for cough or shortness of breath.

Cardiac: Negative for chest pain, pressure or palpitations. No swelling reported in extremities.

Gastrointestinal: Negative for abdominal pain. Has daily bowel movements without difficulty. Denies diarrhea or constipation.

GU: Negative for dysuria, burning, frequency, urgency or hematuria. Denies flank pain.

GYN: Midline episiotomy healed without discomfort. No pain with intercourse or sexual difficulty reported.

Breasts: States breastfeeding is going well. Denies pain, lumps or masses. No nipple pain.

Hematologic/Lymphatic: Negative for bleeding, easy bruising or lymphadenopathy.

MSK: Denies new or significantly changed myalgia/arthralgias.

Neuro: Denies dizziness, numbness or tingling.

Endocrine: Denies changes in heat or cold tolerance. Expected post-partum weight changes.

Skin: Negative for rash or lesions.

Physical Exam

BP 122/78 | Pulse 82 | Temp 98.5° F (36.9°C) Resp 18 | Wt 170 lb Ht: 5'7 BMI: 26.6

Constitutional: Alert and pleasant, well-appearing female in no apparent distress.

Skin: Pink, warm and dry. No rashes or lesions observed.

Head: Normocephalic, without obvious abnormality, atraumatic.

Eyes: Conjunctiva clear, sclera anicteric.

Ears: Ear canals patent, TMs pearly grey with appropriate cone of light bilaterally. No erythema or bulging present.

Throat: Posterior pharynx without erythema or exudate.

Respiratory: No cough, respiratory effort non-labored. Lungs without wheezing, crackles or rhonchi.

Heart: Regular rate and rhythm. S1, S2 auscultated without murmur, rub or gallop. Extremities non-edematous, radial pulses 2+.

GI: Abdomen soft, non-tender. Bowel sounds present. No organomegaly or masses palpated.

GU: Deferred at this visit. (*Episiotomy would be assessed.*)

Neuro: Denies headaches or dizziness.

MSK: 2+ patellar reflexes bilaterally. No clonus present. No edema.

Breasts: Deferred at this visit. (*Would assess for symmetry, engorgement, tenderness, nipple position, lymph nodes.*)

Assessment/Plan Pertinent To This Case Study:**1. Anticipatory Guidance: Breastfeeding and return to work**

Discussed return to work and breastfeeding strategies. Currently she plans to pump and supplement with formula upon return to work. Congratulated her on successful breastfeeding thus far and provided encouragement for pumping in the work place. Instructed her to continue fluid intake. Encouraged her to discuss possible pumping locations with co-workers who have done the same and to continue breastfeeding as long possible.

Discussed breast assessment and symptoms of plugged ducts.

Will further discuss how transition to work, reinforce signs and symptoms of mastitis as well as prevention at next visit following postpartum GTT.

Literature Review

As previously established, mastitis is a breastfeeding complication which may affect as many as one third of lactating women. Since breastfeeding has overwhelming physical and psychosocial benefits for both mother and child, maintenance of lactation is vital. If weaning occurs rapidly, or feedings become infrequent and breasts become engorged as may happen when this mother returns to work, she is at risk for developing mastitis (Betzold, 2007).

Appropriate management of mastitis by the health care provider is essential to sustained breastfeeding.

A literature review of mastitis treatment was performed using the PubMed search engine and terms *lactation mastitis* and *treatment*. Articles included in this review are those which pertain to human subjects and include international publications from western nations. The author deemed this appropriate since lactation and the treatment of complications are not exclusive to women in the United States. Studies involving mothers who were HIV positive were excluded from this compilation. Many current reviews and expert opinions were available for analysis and five which met criteria based on this patient's case study are synthesized below.

Articles pertaining to provider support are also included in this discussion. Only two studies comparing antibiotic effectiveness in a randomized control setting have been published with remote publications dates of 1984 and 1996 which met inclusion criteria for a Cochrane Review. Those, along with two novel treatment based articles are presented.

Primary themes in treating mastitis based on current evidence include correct assessment and diagnosis of the infection, non-pharmacologic treatment, and finally effective antibiotic selection. Diagnosis of infection is typically based on clinical presentation and requires the provider to differentiate between simple breast engorgement, non-infectious versus infectious mastitis, skin infection and neoplasm (Betzold, 2007). This review will focus on infectious mastitis, since treatment options can be challenging.

Diagnostic criteria for infectious mastitis varies, however typical cases in lactating women will present with, “localized, unilateral breast tenderness and erythema, accompanied by a fever of 101°F (38.5° C), malaise, fatigue, body aches, and headache” (Spencer, 2008, p.730). Other definitions include a “tender, hot, swollen, wedge-shaped area“ (Academy of Breastfeeding Medicine Protocol Committee, 2008, p. 177). A patient with infectious mastitis will be more likely to have symptoms which, “persist for more than 24 hours, be bilateral, or elicit high fever and/or produce significant breast discomfort” (Betzold, 2007, p. 596). Women are most at risk for developing mastitis during the early post-partum period, generally between 4 and 8 weeks (Cusak& Brennan, 2011; Scott, et al., 2008).

Non-pharmacologic Treatment

Once diagnosed, Betzold (2007) postulated that primary treatment for mastitis should be centered on reversing milk stasis, and preserving breastfeeding with adequate milk supply. This is supported in further reviews with expert opinions (Jahanfar, Ng, & Teng, 2013; Noonan, 2010;

Spencer, 2008). Correction of breast feeding technique along with frequent attempts (as many as 8-12 times daily) to drain the breast adequately should be made starting with the affected side. This may also be accomplished with pumping (Betzold, 2007; Noonan 2010). The infant should be assessed for appropriate positioning and latch during feeding, as well as for a shortened frenulum which may prevent effective milk removal (Cusak & Brennan, 2011; Noonan, 2008; Spencer, 2007).

Additional non-pharmacologic treatments include hot packs prior to feedings and cold packs following to limit inflammation and the associated discomfort. Furthermore, application of chilled cabbage leaves to the breasts may decrease symptoms of engorgement. Massage of the breast tissue will help facilitate let down during feedings and soften the breast (Betzold, 2007; Summers, 2011). Noonan (2010) notes the importance of rest and a healthy diet with child care support from family members when a woman is treating mastitis. Less commonly, other complementary therapies for symptom control include high-potency belladonna, Hepar sulph, *Bellis perennis*, *Phytolacca* and oxytocin nasal spray (Betzold, 2007).

Ultrasound has been suggested as a non-invasive treatment for mastitis, but has not proven to be effective for infectious cases (Spencer, 2008). There is minimal evidence to support its use for plugged ducts, which may be a precursor to mastitis. Lavigne & Gleberzon did a retrospective study of patient records from the author's clinic to determine improvement of blocked ducts in breastfeeding women following therapeutic ultrasound. Although their findings reportedly supported this intervention, their sample size was small ($n=25$), and with an average of 3.3 treatments, participants who experienced improvement did so within 6.8 days. This is confounding as most plugged ducts resolve within 24-48 hours without intervention (Lavigne &

Gleberzon, 2008). As a result, ultrasound is not recommended for treatment of plugged ducts or mastitis.

Along with non-pharmacological treatment options, provider knowledge and support for the patient in cases of mastitis is paramount for the continuation of breastfeeding. Scott, et al., (2008) concluded that one in ten breastfeeding mothers who developed mastitis was instructed to stop nursing on either the affected breast or to wean completely. Their prospective cohort study included 420 breastfeeding women, obtained from a questionnaire filled out upon hospital discharge. While the response rates were high (95%), the authors note that their population may not have had appropriate cross-section representation since they had higher rates of breastfeeding with this group than was found in their overall population. The number of women who developed mastitis and for whom follow up information was available was relatively small ($n=57$). Of these women, 6 (10%) were told to stop breastfeeding altogether. Regardless of sample size, it is significant to note that providers did tragically advise women in the study to discontinue breastfeeding on either one or both breasts.

It is important for the maintenance of lactation that clinicians routinely address any complaint of pain during breastfeeding during clinic visits. In a retrospective, descriptive analysis of provider management and support for breastfeeding pain, Strong (2011) found that while providers offered antibiotics for treatment of breast pain caused by mastitis, non-pharmacologic management and support for breastfeeding was severely lacking when patient charts were reviewed. This retrospective design used randomly selected medical records a data abstraction tool which was subjected to a rigorous test-retest analysis for validity. Her setting was a large OB-GYN medical practice in the mid-southern U.S. In searching for support of breastfeeding in the records, the author found that 17% of charts reviewed had no feeding

method documented at all. With regard to mastitis, it was noted that patients were commonly treated with antimicrobials, but not in conjunction with anti-inflammatory medication or non-pharmaceutical methods. They were not asked about the success of breastfeeding and very rarely referred to a lactation specialist. Evidence based “best practices” for treatment of mastitis were followed inconsistently. Although the length of subjects’ breastfeeding is not reported in the analysis, the investigator makes a convincing argument that providers need to be acutely aware of the impact their support for breastfeeding has on mothers. The article reinforces that women who encounter pain with breastfeeding are less likely to continue with nursing unless they receive help from a professional.

Pharmacologic Treatment

Although pharmacologic treatment is widely used for infectious mastitis, there is little evidence available to help clinicians determine which medication is most appropriate. The Cochrane Library offers one systematic review evaluating evidence for antibiotic use in cases of mastitis. *Antibiotics for Mastitis in Breastfeeding Women* produced only two studies determined to be adequate for analysis. This was based on inclusion criteria of randomized control trials and quasi-RCTs which compared antibiotic use for treatment of mastitis (Jahanfar, Ng & Teng, 2013). Multiple studies were discarded due to faulty methodology or interventions which didn’t match criteria. In the first study Hager (1996) compared treatment with amoxicillin versus cephadine using a randomized control methodology with appropriate blinding. A statistically significant difference between treatment groups was not established in this study. Secondly, Thompson (1984) also using a randomized controlled trial, evaluated antibiotic therapy versus placebo or breast emptying. It was reported that women who received antibiotics has quicker recovery times (2.1 days versus 4.2 days) than those who used breast emptying alone.

Furthermore, women in the antibiotic group did not report development of abscess. The authors of the review found flaws with the study design in terms of concealment and lack of placebo, and recommend further research efforts to corroborate the findings of this 25-year old trial.

The review notes that prescribing parameters such as which antimicrobial to use, when to begin treatment and duration of use are not well defined in the literature. They report that antibiotic choice is generally dictated by provider preference versus scientific findings. As a result, their recommendations were inconclusive regarding support for or against antibiotic effectiveness in lactational mastitis and they call for further research to be done in this area. They note that while emptying the breast efficiently is a hallmark of treatment, there is much conflict as to whether or not to treat mothers with an antibiotic (Jahanfar, Ng & Teng, 2013).

Interestingly, Arroyo, et al. (2010) performed a quasi-RCT of women who had mastitis in which the control group was given an antibiotic prescribed by their PCP, and women two experimental groups received one of two lactobacillus probiotics. The researchers measured bacterial count and in breast milk and symptom resolution. The investigators cite positive improvements of the lactobacillus groups over the control group, and note the relative safety of probiotics over antimicrobials. However it is important to note that five different antibiotics were used in treatment of the control group, thus there is expected variation in their responses to treatment. Furthermore, the authors do not mention if any of the experimental subjects had negative side effects from the probiotics. This study was discarded from the Cochrane review due to lack of a control group which used placebo, no treatment or accepted intervention based on inclusion criteria.

As a result of a significant lack of high-quality research findings available, the literature directs providers to expert opinions and standard medical treatments that are without strong

support in the evidence. The majority of articles report that antibiotics are prescribed empirically to treat the most common causative bacteria, *S. aureus* (Spencer, 2008). Spencer, 2008, notes that culture is not routinely performed since false positives of clean catch expressed milk result from normal colonization of breast milk and, “negative cultures do not rule out mastitis” (p. 730). Betzold (2007) further suggests that microorganisms may be difficult to obtain for culture if they are unable to be expressed from the blocked duct or conversely if bacterial counts are diluted in the expressed milk, thereby decreasing the role of culture in infection management. Despite this, Betzold does suggest that it be considered in cases of infection (2007). Cusack and Brennan (2011) do not address cultures when prescribing antibiotics unless they are done with surgical drainage when an abscess develops. Cultures are generally performed if initial treatment fails or the infection is particularly severe, or MRSA is suspected (Betzold, 2007; Spencer, 2008).

It is widely accepted that *S. aureus* is most often the causative agent of infective mastitis and antimicrobial treatment is directed at this target (Betzold, 2007; Cusack & Brennan, 2011). Although infection by other organisms is rare, possibilities include Streptococcus, which is common in bilateral presentations, *E. coli*, Group A and Group B hemolytic streptococci, *M. tuberculosis*, and *Candida albicans*. Methicillin resistant *S. aureus* should also be considered since there is evidence that these infections are increasing (Betzold, 2007; Cusack & Brennan, 2011; Noonan, 2010; Spencer, 2008; Summers, 2011).

First line antibiotic treatment for infections mastitis is dicloxacillin 500 mg four times a day for 10-14 days, which is a penicillinase-resistant penicillin effective against *S. aureus*. This is followed by cephalexin, and finally clindamycin in cases of severe penicillin allergy (ABM, 2008; Betzold, 2007; Noonan, 2008). Erythromycin may also be considered in case of penicillin

allergy (Betzold, 2007; Cusak & Brennan, 2011). Spencer's review for the publication *American Family Physician* (2008) lists amoxicillin/clavulanate, 875 mg twice daily as a treatment option, which may be beneficial in patients who find it difficult to be compliant with 4-times daily dosing. All articles reviewed note that antibiotics are prescribed empirically and duration of treatment has not been well studied.

Additional pharmacological management includes pain management with an appropriate medication. Tylenol is safe to use, however ibuprofen may help decrease inflammation in addition to discomfort, which will aide in milk release and is safe in breastfeeding (ABM, 2008; Noonan, 2010 & Summers, 2011).

Learning Points

The provider treating a lactating woman with mastitis should recognize the following:

1. The treatment goal for mastitis is continued breastfeeding to maximize health benefits for both mother and child.
2. Non pharmacologic treatment includes instructing the patient to actively empty the affected breast and maintain breastfeeding. Further options include hot or cold compresses to the breast.
3. Support for breastfeeding should be given by the clinician and reassurance provided that symptoms are generally short lived and resolve with appropriate treatment. Mothers should be offered resources which support proper lactation and the maintenance of breastfeeding.
4. Current pharmacologic treatment recommendations are as follows: Dicloxicillin 500 mg po qid for 10-14 days. Cephalexin or clindamycin may also be used. Pain should be addressed and managed with ibuprofen. Improvement should be seen within 48 hours, otherwise culture is indicated. The provider should recognize that there is a need for evidence to support the use of antibiotics.

Conclusion

With proper support and appropriate treatment, mothers who develop mastitis can continue to breastfeed their children as desired. Open discussions between providers and patients, like the one in this case study, can solidify positive attitudes towards nursing, and create a comfortable environment where numerous treatment options are available. Providers need to use critical assessment skills and be knowledgeable about current recommendations in mastitis treatment to ensure positive outcomes for breastfeeding mothers.

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