BREAST CONDITIONS DURING PREGNANCY AND LACTATION

An understanding of unique breast conditions associated with pregnancy and lactation is essential for evaluation and management of breast problems in pregnant or lactating women

S R ČAČALA, *BSc, MB ChB, FRACS*

Department of Surgery, Grey's Hospital, Pietermaritzburg, KwaZulu-Natal

Shas Čačala is an Australasian-trained general surgeon currently working in Pietermaritzburg. Her subspecialty interests include breast, endocrine and soft-tissue tumour surgery.

Correspondence to: Shas Cacala (shas.cacala@gmail.com)

During pregnancy and lactation the breast can be affected by a variety of specific and unique disorders. In addition to mastitis, lactational abscesses and other benign conditions unique to pregnancy and lactation, any breast problem seen in the non-pregnant woman may present during pregnancy or lactation. In this article some of the commoner and interesting problems are reviewed.

In a study of 91 benign breast pathologies in pregnant women, 70% were inflammatory/infective and 30% were benign focal masses: fibroadenomas (40%), lactating adenomas (30%), galactoceles (17%) and papillomas (2%).[1] No benign condition necessitates the termination of lactation, and cessation may actually exacerbate some conditions. In addition to benign lesions, breast malignancy may present during pregnancy or postpartum. Breast problems may be of a diffuse or focal nature.

During pregnancy and lactation the breast can be affected by a variety of specific and unique disorders.

Diffuse conditions

The most common problems fall into a spectrum of infectious complications from milk stasis or mastitis to frank abscess formation.

Engorgement is the rapid increase in milk production which occurs at secretory activation around days 2 - 5 postpartum. Breasts may become tense and painful. Relief is obtained with frequent feeding and/or effective emptying of breast milk. Cold compresses may assist in symptomatic relief. Severe engorgement may lead to compromised milk supply, nipple trauma and mastitis.

Up to 20 - 25% of breastfeeding women will develop **mastitis** and up to one-third of these women will experience recurrent episodes.[2-4] Just over half of the initial episodes occur within the first month postpartum.[5] Clinically, mastitis is a diffuse or localised area of inflammation with erythema, pain and induration present for at least 1 day with either an elevated temperature or constitutional symptoms of fever. The management is conservative, with frequent breastfeeding or milk emptying from the affected breast(s), in an effort to clear blocked ducts and engorgement. Increasing maternal oral intake, warm or cold compresses and bed rest may help.

Antibiotics are indicated for patients with acute pain, severe symptoms, fever or any other signs of systemic infection. *Staphylococcus aureus* is the commonest organism responsible for mastitis. Penicillinase-resistant penicillins such as flucloxacillin (250 - 500 mg 6-hourly for 10 - 14 days) and dicloxacillin are the antibiotics of choice, or cephalexin and clindamycin in women allergic to penicillin.[6] Breast-milk bacteriology is not useful in most cases as pathological bacteria are found in the milk of healthy breastfeeding women. If nipple candidiasis is diagnosed, antifungal treatment must be given to mother and infant simultaneously. The mother should apply topical antifungal cream twice daily and the infant should be given oral drops 4 times daily, continuing for 2 days post resolution.[7] In refractory or recurrent cases of mastitis, an ultrasound scan should be performed to exclude an abscess, milk cultures taken for microbiology to identify atypical or drug-resistant bacteria, and a biopsy considered to rule out inflammatory breast carcinoma or other pathology.

Breast **abscesses** occur as a complication in 3% of mastitis cases in developed countries.[8] They result from untreated, delayed, inadequate or incorrect treatment of mastitis. Risk factors include previous episodes of mastitis, avoiding breastfeeding on the affected side and acute weaning. Abscesses are located subareolar (23%), intramammary unilocular (12%), or intramammary multilocular (65%).[9]

Clinically abscesses present as tender erythematous focal masses, but if they are deep-seated there may not be a distinct mass, making distinction from mastitis difficult. Abscesses are not always fluctuant. Ultrasound can be used for diagnosis, although needle aspiration of pus also confirms an abscess. Treatment is either by needle aspiration (via palpation or ultrasound guidance) or incision and drainage. Abscesses smaller than 3 cm can be treated with aspiration. Multiple aspirations may be required, with follow-up ultrasounds to ensure resolution of the abscess. Failure of needle aspiration is noted in abscesses >5 cm in diameter, unusually large volume of aspirated pus and delay in treatment.[10] Failed aspiration or large abscesses require surgical incision and drainage. This successfully treats the abscess but many women are not pleased with the cosmetic outcome.[10]

The commonest organism is *S. aureus*.[9] However, occasionally other organisms are isolated. Organism culture and sensitivity is important for appropriate treatment, especially with the increasing incidence of methicillin-resistant *S. aureus* (MRSA). Breastfeeding or milk expression can and should continue during and after treatment. Weaning or inhibition of lactation may actually hinder abscess resolution.

The most common problems fall into a spectrum of infectious complications from milk stasis or mastitis to frank abscess formation.

Nipple trauma presents as fissures, erythema, crusting, blisters and swelling of the nipple. This is associated with pain and is usually secondary to positioning and latching of the infant during breastfeeding. Other causes of nipple pain include eczema, herpes and fungal infections.

Blood-stained nipple discharge during pregnancy and or lactation is fairly common. Most often it is due to vascular engorgement and mild trauma from breastfeeding. Infrequently bloody discharge is due to an intraductal **papilloma** and rarely to a non-benign lesion. Papillomas are polypoidal epithelial lesions that project into the duct lumen. Persistent bloody discharge after weaning or worsening discharge during lactation are indications for referral to a specialist. Management of papillomas is surgical with either microdochectomy or subareolar duct excision, although fibreoptic ductoscopy with biopsy and excision is performed in some specialist centres.

Massive breast hypertrophy (gigantomastia) is a rare condition during pregnancy. There is an exaggeration of the normal physiological hypertrophy of pregnancy and the condition occurs in 1 out of every 28 000 - 100 000 pregnancies.[11] It may be due to heightened sensitivity to oestrogen, progesterone and prolactin. There is massive enlargement of the breasts which may result in tissue necrosis, ulceration, infection, and occasionally haemorrhage and death. Typically, resolution to near pre-pregnancy size occurs postpartum, yet 39% of patients request surgical intervention.[12] Surgery involves mastectomy with or without reconstruction or reduction mastopexy. In the latter, there is 100% recurrence rate during subsequent pregnancies.[12] Surgery is usually reserved until after weaning, but in severe cases it is performed during pregnancy. Gigantomastia is usually bilateral. The presence of a tumour should be suspected in unilateral breast enlargement.

Focal conditions

During pregnancy and lactation there is an increase in the glandular component compared with adipose tissue in the breast, making the breast firmer and lumpier and abnormalities more difficult to detect. Any new persistent focal lump, or alteration in a pre-existing lump, is considered abnormal and should be evaluated and managed appropriately. Features that raise clinical concern include: breast lumps without improvement in 72 hours, unilateral lactation failure with a palpable mass or infant rejection of one breast, an area of milk stasis that repeatedly occurs in the same area, or symptoms of mastitis without fever that do not resolve with antibiotics. Referral to a specialist for triple assessment of any solid mass is mandatory.

Imaging of the pregnant or lactating breast is usually done for evaluation of a palpable lump. Other indications include persistent inflammatory change, suspicion of an abscess, persistent bloody nipple discharge, Pagetoid changes of the nipple, or axillary lymphadenopathy.

Ultrasound can be targeted to the palpable abnormality. It is the initial imaging modality of choice for investigation of the pregnant or lactating breast. It is non-invasive and distinguishes solid from cystic lesions as well as displaying certain features peculiar to different lesions. The identification of a solid mass necessitates biopsy. If malignancy is diagnosed then a **mammogram** should be performed to check for synchronous lesions in the breasts. Mammography of the lactating breast is not routinely done for benign lesions as increased glandular tissue and milk secretion causes an increase in the breast radio-density, making the radiographs difficult to interpret.

Indications for **biopsy** of the breast are the same for pregnant and non-pregnant women, and should be done without delay.

Fine-needle aspiration cytology (FNAC) is an effective first-line investigation of breast mass(es) during pregnancy and lactation,[13] but relies on the availability and expertise of the cytopathologist.

A **core biopsy** (freehand or ultrasound guided) is the usual procedure for obtaining histology of a breast mass during pregnancy and lactation. There is a slightly greater risk of bleeding due to increased vascularity, and an increased infection rate due to duct dilatation, milk production and skin/nipple trauma from breastfeeding. A milk fistula is a complication unique to pregnant or lactating patients. These complications are infrequent, however, so core biopsies are a safe and cost-effective means of obtaining tissue diagnosis.

Blood-stained nipple discharge during pregnancy and or lactation is fairly common. Most often it is due to vascular engorgement and mild trauma from breastfeeding.

Focal masses

Galactoceles are localised collections of milk in the terminal ducts, probably resulting from ductal obstruction by either a lesion or inflammation. Galactoceles are smooth, mobile, sometimes tender lumps with typical ultrasound appearances. Aspiration of milk confirms the diagnosis and is therapeutic. Repeat aspirations may be required, but surgical excision is seldom necessary. Galactoceles do not preclude breastfeeding.

Fibroadenomas are the commonest benign breast tumour in women <35 years. About 10 - 20% are bilateral or multiple. Fibroadenomas may grow rapidly during pregnancy and lactation due to increased oestrogen. These enlarging or new lesions are smooth, firm and mobile, with unique ultrasound characteristics. Diagnosis is confirmed on biopsy. Occasionally fibroadenomas infarct during pregnancy or lactation.

Lactating adenomas are relatively uncommon breast tumours developing from the innermost layer of alveoli which is comprised of lactocytes. Ultrasound is not diagnostic and core biopsy is preferred to FNAC for diagnosis. Many adenomas resolve after weaning. Bromocriptine can be used to shrink persistent adenoma[14] but some women opt for surgical excision.

Accessory breast tissue may be present along the milk lines in 2 - 6% of women.[15] Most commonly it is located in the axilla, presenting as a thickening or a mass. It may become troublesome during pregnancy and lactation, increasing in size and tenderness under hormonal influences along with the rest of the breast. After diagnosis, accessory breast tissue does not warrant any intervention unless it causes discomfort or is cosmetically unsightly. In those cases surgical excision is possible after weaning. Pathological changes such as mastitis, fibroadenoma, phylloides, carcinoma, and duct hyperplasia may occur in accessory breast tissue. Occasionally breast tissue is found in unusual locations, such as the scapula, thigh and labia majora.

Mondor disease of the breast is superficial thrombophlebitis which presents as a tender subcutaneous cord plus/minus tethering of the skin. It can occur secondary to trauma (including breastfeeding) or excessive physical strain. The condition is self-limiting, with symptomatic relief from topical anti-inflammatories.

Breast cancer is the second commonest malignancy during gestation, after cervical cancer.[16] Pregnancy-associated breast carcinoma (PABC), defined as breast cancer occuring during pregnancy or within 1 year of delivery, represents up to 3% of all breast malignancies, occurring in 1 - 3 cases per 10 000 pregnant and postpartum women.[16] Its prevalence is likely to increase as many women defer childbearing to their later fertile years.

PABC usually presents as a palpable mass. Swelling, erythema and diffuse breast enlargement are less common features that suggest locally advanced carcinoma which may mimic mastitis. The larger cancer size at diagnosis is probably due to diagnostic delays. The clinical work-up is as for any solid mass with imaging and biopsy.

Management of breast cancer in pregnancy must take into consideration the gestational age and effects of treatment on the fetus. Surgery by modified radical mastectomy with axillary lymphadenectomy may avoid radiotherapy during pregnancy. However, breast conservation surgery (followed by adjuvant radiotherapy) is feasible when breast conservation criteria are fulfilled. Sentinel node biopsy may be performed using blue dye alone, as the use of a radioisotope may be a radiation risk to the fetus.

Chemotherapy in PABC may be adjuvant (after surgery) or neo-adjuvant (prior to surgery). It is best avoided during the first trimester of pregnancy as it is associated

with an increased risk of miscarriage or congenital malformations, but can be used in the second and third trimesters with minimal fetal complications. Chemotherapy is contraindicated in breastfeeding as cytostatics are released into the milk.

Histological types of breast cancer are comparable, but lymph node involvement and oestrogen-receptive negative tumours may be commoner in PABC patients compared with control groups.[17,18] Tumour expression of Her2/neu protein varies in different trials. However, the outcome of PABC patients compared with non-PABC patients remains controversial. In 11 case control series of patients with PABC, 73% showed no survival difference and 3 studies (27%) concluded worse outcome in PABC.[17,18] Ongoing registration and review is needed to obtain a better understanding of PABC.

Management of breast cancer in pregnancy must take into consideration the gestational age and effects of treatment on the fetus.

Primary breast lymphoma is a rare form of localised extranodal lymphoma, comprising up to 0.5% of all breast cancers. It usually occurs during pregnancy or lactation. Mucosal B-lymphocytes migrate to the breasts during late pregnancy and lactation, which might explain why massive breast involvement by tumour is seen at this time. These tumours are rapid-growing and may ulcerate and bleed. After biopsy for diagnosis, chemo-radiotherapy is the preferred treatment.

Conclusion

An understanding of unique breast conditions associated with pregnancy and lactation as well as appreciating that any breast pathology may present during this time, is essential for evaluation and management of breast problems in pregnant or lactating women.

References available at www.cmej.org.za

SINGLE SUTURE

Worm vaccines may help the one but harm the many

Parasitic worms can adjust their survival strategy based on their host's immune response. This means that potential vaccines against elephantiasis might make the infection spread more easily through communities.

Elephantiasis infects 120 million people a year in Africa and Asia. The only prevention is an annual dose of drugs, but fewer than half of those at risk receive them. Work is underway on a vaccine, but Simmon Babayan and colleagues at the University of Edinburgh, Scotland, have discovered that some vaccines may make the worms worse. When filaria worms in mice sense that the mouse is mounting a strong immune response, they change their life cycle, producing more offspring in the blood earlier. This helps the worm ensure that it will be picked up and transmitted by another mosquito despite the immune attack.

Unfortunately experimental vaccines rely on the very immune reactions that warn the worms. People who get such a vaccine may defeat their own infection, but the worm's early response means that they will pass on more infections.

Babayan says that potential vaccines should be tested for whether their targets adapt to them in this way.

New Scientist, 23 October 2010, p. 17.

SINGLE SUTURE

Light and emotion

Why are we happier on sunny days? It seems that light taps directly into brain areas that process good and bad emotion.

Although light is used to treat mood disorder we don't know how this works. Rods and cones process visible light, but there is a third type of photoreceptor, particularly sensitive to blue light, that mediates non-visual responses such as sleep cycles and alertness. So light may help us feel better because it helps to regulate circadian rhythms.

Gilles Vandewalle and colleagues of the University of Liège, Belgium, wondered whether this pathway directly affects our emotional state too. To find out, they scanned the brains of volunteers exposed to green or blue light while a neutral or angry voice recited meaningless words. As expected, brain areas responsible for processing emotion responded more strongly to the angry voice, but this effect was amplified by blue light.

Vandewalle suggests that blue light is likely to amplify emotions in both directions.

New Scientist, 30 October 2010, p. 19.