



ORIGINAL RESEARCH PAPER

Oncology

PREGNANCY ASSOCIATED BREAST CANCER – REVIEW OF LITERATURE

KEY WORDS: pregnancy-associated, breast cancer

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ABSTRACT

Pregnancy-associated breast cancer (PABC) is defined as breast cancer diagnosed during pregnancy or in the first postpartum year. Breast cancer affects approximately 1 in 3000 pregnant women. Breast cancer is the second most common malignancy occurring during pregnancy worldwide, after cervical cancer. The evaluation of breast cancer symptoms during pregnancy and the postpartum period can be challenging due to the hormonally induced changes in breast tissue that may lead to increased firmness and nodularity.

Risk factors for pregnancy induced breast cancer include early age of menarche, genetic mutations (BRCA1 and BRCA2), family history, alcohol consumption and previous benign breast disease. To conclude, use of surgery and chemotherapy (especially after the first trimester of pregnancy) is reasonably safe and currently modified radical mastectomy with axillary clearance followed by adjuvant chemotherapy is the treatment of choice. Radiotherapy, as a treatment modality, is not recommended till after delivery. The termination of pregnancy is not justified as it does not improve prognosis.

Pregnancy-associated breast cancer (PABC) is defined as breast cancer diagnosed during pregnancy or in the first postpartum year. Breast cancer affects approximately 1 in 3000 pregnant women. Breast cancer is the second most common malignancy occurring during pregnancy worldwide, after cervical cancer. Every one in five breast cancers diagnosed in women aged 25-29 years are pregnancy associated breast cancers. The mortality of PABC is not higher as compared to patients with breast cancer not associated with pregnancy (non-PABC) Such concurrence is more likely in BRCA1 and BRCA2 mutation carriers. In terms of life time breast cancer risk, it seems that the age of 35 years acts as a critical point.¹

The evaluation of breast cancer symptoms during pregnancy and the postpartum period can be challenging due to the hormonally induced changes in breast tissue that may lead to increased firmness and nodularity. Also, the symptoms of postpartum lactational mastitis mimic locally advanced or inflammatory breast cancer. Majority of PABCs patients present with a palpable mass. Less frequently, breast cancer during pregnancy presents as breast erythema, breast swelling, bloody nipple discharge, or distant metastasis. Completing a reliable diagnostic workup with imaging to determine the extent of disease is important in treatment decision-making. In a nonpregnant patient, breast imaging includes ultrasound, mammogram, and breast magnetic resonance imaging (MRI). During pregnancy, ultrasound is used widely. Mammography during pregnancy confers minimal dose to the fetus with abdominal shielding (0.001–0.01 mGy with two views), which is much less than the minimum threshold of 200 mGy for adverse effects during organogenesis (up to 10 weeks of gestation). Contrast-enhanced breast MRI is a useful diagnostic tool in non-PABC, the safety of gadolinium in pregnancy is controversial. Gadolinium crosses the placenta and remains in the amniotic fluid to be swallowed by the fetus and thus enters the fetal circulation. Also, the prone positioning necessary for breast MRI may lead to prolonged pressure on the gravid uterus, disrupting uterine blood flow. In lactating women, gadolinium is excreted in breast milk is 0.0004% of the maternal dose, and therefore, the American College of Radiology guidelines do not require that patients discontinue breastfeeding after contrast-enhanced MRI. In some advanced PABC cases where metastases are suspected, a metastatic workup before

delivery may be necessary to guide treatment decisions. Lungs, bone, and liver are the most common metastatic sites of breast cancer, therefore a pregnant patient may undergo a chest X-ray with abdominal shielding, liver ultrasound, and non-contrast supine MRI in place of the bone scan to complete the metastatic workup. The fetal dose of PET/CT has been found to be 10–50 mGy and therefore is usually deferred to the postpartum period.²

Risk factors for pregnancy induced breast cancer include early age of menarche, genetic mutations (BRCA1 and BRCA2), family history, alcohol consumption and previous benign breast disease.

Treatment³⁻⁵:

- Radiotherapy:
- Patients who choose breast conservation or who require postmastectomy radiation must delay radiation treatment until after delivery to avoid exposure to the fetus.
- Adjuvant radiation therapy should begin within 8–12 weeks to maintain disease-free survival advantage.

Gestational Age	Surgery	Chemotherapy
First Trimester (upto 13 weeks 6 days)	Deferred till 2 nd trimester or after organogenesis (10 weeks)	Defer
Second Trimester (14 – 27 weeks 6 days)	Mastectomy/ Lumpectomy (Electronic Fetal Monitoring before & after surgery)	Acceptable [Cyclophosphamide, 5-fluorouracil, and doxorubicin use reported in the literature (taxanes, platinum-based agents are less studied)]
Third Trimester (28 weeks to delivery)	Mastectomy/ Lumpectomy (Electronic Fetal Monitoring before & after surgery)	Acceptable Discontinue chemotherapy 3 weeks before delivery

To conclude, use of surgery and chemotherapy (especially after the first trimester of pregnancy) is reasonably safe and currently modified radical mastectomy with axillary clearance followed by adjuvant chemotherapy is the

treatment of choice. Radiotherapy, as a treatment modality, is not recommended till after delivery. The termination of pregnancy is not justified as it does not improve prognosis.

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