Breast Cancer and Pregnancy: A Review

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Abstract

Breast cancer is one of the most commonly encountered types of malignancy during pregnancy. Here, we review the most recent data with regards to this special patient population. Current evidence shows that it is appropriate for oncologists to treat these patients carefully with a coordinated multidisciplinary approach.

Keywords
- breast cancer
- pregnancy
- review

Breast Cancer and Pregnancy

Breast cancer is one of the most commonly encountered types of malignancy during pregnancy.[1,2] In fact, up to 4% of all breast cancers occur during this period.[3,4] This presents a unique scenario to both the patient and the physician since the patient faces the fear of how the cancer can affect her own personal survival and that of the fetus. The managing oncologist may have limited experience in managing these patients due to their rarity. Furthermore, the holistic management of the pregnant patient with breast cancer also involves ethical and moral constructs.[5]

Historically, physicians believed that breast cancer in pregnant patients were more aggressive, convincing some to forgo the treatment of these patients.[6,7] As we learned about the relationship and the role of the estrogen receptors in breast cancer, physicians considered pregnant patients with breast cancer to have a poor prognosis, leading to the concept of therapeutic abortion to augment survival.[6,8,9] Adding to its poor prognoses is the fact that majority are often axillary lymph node positive, with larger primary tumor size. Histologically, these tumors are often poorly differentiated, hormone receptor (HR) negative, and approximately 30% are human epidermal growth factor receptor 2 (HER2)positive.[10,11]

Previous reports on outcomes for these patients show mixed results as some have reported poor prognoses, while others are more encouraging.[12-15] Here we review the most recent data with regard to this special patient population.

Assessment

Women presenting with a breast lump during pregnancy should be properly evaluated by a breast specialty team and appropriate diagnostic tests should be done.[14] Mammogram of the breast maybe done safely with shielding and is reported to have an accuracy of >80%.[16] Ultrasound can also be used to assess the breast and regional lymph nodes, and to guide biopsy. Core needle biopsy is the preferred technique since it facilitates histologic confirmation and provides adequate tissue for HR and HER2 analyses.

The staging should be tailored to minimize fetal exposure to radiation. Bone scanning and pelvic X-ray or computed tomography are not recommended because of the possible effects of irradiation on the fetus.[14]

Assessment of pregnancy should include maternal fetal medicine consults and review of maternal risks and comorbidities. Documentation of fetal growth and development by ultrasound is a must. These patients should also be counseled regarding their disease, treatment options including their risks, and fertility-preservation opportunities.

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Treatment of Breast Cancer during Pregnancy

The most common surgical procedure has been modified radical mastectomy. However, breast-conserving surgery is also possible if radiation therapy can be delayed to the postpartum period since there is growing evidence that breast-conserving therapy does not negatively impact survival.[17,18] A review of the absolute and relative contraindications to sentinel node biopsy concluded that it should not be offered to pregnant patients with less than 30 weeks of gestation due to concerns of fetal exposure to radioactive material.[19]

The indications for systemic chemotherapy in the pregnant patient are similar to the nonpregnant breast cancer patients except that chemotherapy should not be given during the first trimester since this period has the greatest risk of fetal malformation.[20-22] The risks of fetal malformation in the second and third trimesters are approximately 1.3%, which is a rate similar to fetuses not exposed to chemotherapy.[23] Fetal monitoring prior to each chemotherapy cycle is recommended. It is important to note that chemotherapy should not be given after the 35th week of pregnancy or within 3 weeks of planned delivery to avoid hematologic complications. One prospective study showed that 5-Fluorouracil (5-FU), doxorubicin, cyclophosphamide (FAC) chemotherapy is relatively safe to be given during the second and third trimesters.[21] Data are limited regarding the use of taxanes during pregnancy,[24-27] but weekly paclitaxel is recommended by the National Comprehensive Cancer Network should the physician decide to use it. Trastuzumab, endocrine, and radiation therapy are contraindicated during pregnancy due to concerns on their effects on the fetus such as oligohydamnrios or anhydamnrios, and renal failure.[28-43]

During the postpartum period, the Royal College of Obstetricians and Gynaecologists (London, United Kingdom) recommends that women should not breastfeed when taking trastuzumab or tamoxifen, because it is unknown whether these drugs are transmitted in breast milk.

Recommendations from different international organizations are shown in ►**Table 1**.

Table 1 Recommendations from international organizations on the management of breast cancer in pregnant patients

Management option	Society	Clinical recommendations
Diagnosis	NCCN	• Referral to a breast specialty team • Mammogram with shielding • Ultrasound of breast and axillary lymph nodes • Biopsy: core needle (preferred), fine needle aspiration is an option • If clinically indicated: o Chest X-ray with shielding o Liver and renal function assessment o Ultrasound of the liver o Screening MRI of thoracic and lumbar spine WITHOUT contrast
	RCOG	• Bone scanning and pelvic X-ray/CT scans are NOT recommended
	ESMO	• Should be limited to those associated with the lowest exposure to ionizing radiation • AVOID: • Abdominal plain films o Isotope scans o CT scans • SAFE: o Chest X-ray with shield o Abdominal ultrasound
Local therapy	NCCN/ESMO	• Modified radical mastectomy • Breast conservation therapy possible if radiation therapy can be delayed to postpartum period • Sentinel lymph node biopsy contraindicated to pregnant women under 30 weeks gestation
Systemic therapy	NCCN	• Indications similar to nonpregnant patient • Should NOT be given during the first trimester • Chemo regimens: o Anthracycline and alkylating agents o FAC regimen—safe according to a prospective trial o Weekly paclitaxel—recommended taxane regimen although data is limited
	NCCN/ESMO/RCOG	• Contraindicated: o Chemo during the first trimester o Chemo after 35 weeks o Trastuzumab o Endocrine treatment o Radiation treatment

Abbreviations: ESMO, European Society of Medical Oncology; NCCN, National Comprehensive Cancer Network; RCOG, Royal College of Obstetricians and Gynaecologists.

Prognosis of Breast Cancer during and after Pregnancy

A large series that investigated the prognosis of pregnant breast cancer patients concluded that there were no observed differences in disease-free or overall survival on the basis of pregnancy at the time of diagnosis.[14] This study, which involved a total of 311 patients, confirmed that pregnancy was not a factor in recurrence risk or risk of death for the pregnant patients examined.

Another study involving 333 pregnant patients also reported no differences in disease-free survival for pregnant or nonpregnant patients and an improved survival for those who became pregnant after successful breast cancer treatment. Hormone receptor status was found to have no influence on the relapse-free survival of the cohort.[13]

These reports provide convincing evidence that pregnancy does not have an impact on breast cancer. With a multidisciplinary approach the cancer can be treated, the pregnancy can be successful, and the outcome for both the mother and the neonate can be expected to be favorable.[5]

For the young patients with breast cancer who have not yet completed their desired family size, there is evidence showing that subsequent childbearing after treatment is unlikely to increase the risk of mortality.[15]

Conclusion

In lieu of level 1 evidence to address the management of breast cancer in pregnant patients due to the scarcity of data, it is appropriate for oncologists to treat these patients carefully with a coordinated multidisciplinary approach.

Conflict of Interest

None declared.

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