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Use of Chemotherapy in Pregnant Breast Cancer Patients

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Abstract

With fertility now possible at a later age, women find themselves at an increased risk for concurrent breast cancer diagnosis. Due to the teratogenic effects of most chemotherapeutic agents, difficult decisions must be made regarding the best outcomes for both mother and baby. Depending on the stage of their cancer, the gestational age of the fetus, and the timing of the diagnosis, women must choose between a therapeutic abortion, safer surgical modalities, a modified treatment plan beginning in the second or third trimester, or postponement of the treatment until the baby is born. Oncology and OB/GYN nurses need to be aware of these complex cases and offer advanced support and care to meet the needs of their patients.

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Breast Cancer Patients

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With fertility now possible at a later age, women find themselves at an increased risk for concurrent breast cancer diagnosis. Due to the teratogenic effects of most chemotherapeutic agents, difficult decisions must be made regarding the best outcomes for both mother and baby. Depending on the stage of their cancer, the gestational age of the fetus, and the timing of the diagnosis, women must choose between a therapeutic abortion, safer surgical modalities, a modified treatment plan beginning in the second or third trimester, or postponement of the treatment until the baby is born. Oncology and OB/GYN nurses need to be aware of these complex cases and offer advanced support and care to meet the needs of their patients.

A new pregnancy may be an overwhelming experience and ushers in drastic changes to a woman's life. When pregnancy is complicated by the occurrence of breast cancer, women, their families, and their clinicians face difficult choices in judging the risks and benefits of treatment and their effects on mother and baby alike (Dean, 2007). With fertility becoming possible in later years of adulthood, women are increasingly at risk for concurrent pregnancy and malignancy. The incidence of breast cancer is 1 in 3,000 pregnancies (Pavlidis, 2002). An ethical issue erupts when for long term survival a pregnant woman must balance her optimal treatment with the health and safety of her unborn child. The teratogenic effects of chemotherapeutic agents can negatively affect a developing fetus during pregnancy. The medical needs of the mother and protecting the fetus are two conflicting priorities. With 3,500 pregnant women diagnosed every year with various types of cancer, nurses must be increasingly aware of the specialized needs, support, and interventions to provide optimal care (Pavlidis, 2002).

Context in Maternal and Fetal Health

Women may not be aware of the variations when pregnancy and malignancy interact in the body. An initial diagnosis of breast cancer may be delayed 5 – 7 months in pregnant women; breast lumps or masses are commonly attributed to the hormonal shifts in antepartum (Dean, 2007). Pregnancy can also account for fatigue, nausea,

vomiting, swelling, and increased skin pigmentation, symptoms similar to those in malignancy. A woman's immune system can weaken naturally during pregnancy just as pathologically cancer will lower white blood cell counts. This endangers the woman and her baby to various infections (Moran, Yano, Al Zahir, & Farquharson, 2007). These changes may complicate a cancer diagnosis when in conjunction with an active pregnancy.

Women weigh a variety of priorities, risks, benefits, and options to decide upon an effective treatment. Radiation, chemotherapeutic agents, anesthesia, and surgery create the highest risk of birth defects in the first trimester (Moran et al., 2007). In this crucial stage for the developing fetus, all possible teratogenic substances and radiotherapy are to be avoided. "In addition, the adverse effects of radiation are directly related to the stage of gestation – the earlier the stage, the more detrimental the expected effects (Pavlidis, 2002, p. 280)." The standard of care for many stage I and stage II breast cancer are surgical resectioning and mastectomy (Dean, 2007). Any breast reconstruction is delayed until delivery. Radiotherapy and chemotherapy should be withheld to ensure the safety of the fetus. Exposure to chemotherapy in the first trimester is linked to spontaneous abortions, intra-uterine fetal demise, and serious abnormalities (Cardonick & Iacobucci, 2004). Staging scans, such as x-rays and

computerized tomography (CT) scans expose fetuses to harmful ionizing radiation. Magnetic Resonance Images's (MRI) and ultrasounds provide a safe imaging tool to utilize in pregnant women (Dean, 2007).

In stage III and IV cases of metastatic breast cancer, abortion may be considered most logical first step in a treatment plan. The existence of metastatic disease demands that the patient receive immediate adjuvant chemotherapy. Delaying this treatment would result in shorter life span, shorter time to progression, and poorer outcomes. While therapeutic abortion would allow the patient to fully pursue the most effective chemotherapy regimen without worry of teratogenicity, no evidence has been shown that a therapeutic abortion increases survival (Epstein, 2007). "In the 1980s and 1990s, therapeutic abortion failed to improve survival, and it was found that pregnancy had no effect on the course of the disease" (Pavlidis, 2002, p. 281). Therapeutic abortions are rarely advised and only suggested in advanced breast cancer cases diagnosed early in pregnancy (Pavlidis, 2002).

A modified chemotherapy treatment during the second and third trimesters decreases risk to pregnant mothers and fetuses. "Despite the fact that all chemotherapy drugs are capable of crossing the placenta, fetal toxicity is clearly dependent on the time of treatment" (Pavlidis, 2002, p. 284). Teratogenic drugs such as taxanes, vinorelbine, and trastuzumab are avoided; however, fluorouracil, epirubicin, cyclophosphamide, and others appear relatively safe (Dean, 2007). Oncologists who prescribe "gestational chemotherapy" for pregnant women with breast cancer, find that anthracycline-based treatment results in "minimal complications of labor and delivery" and "minimal risk to the fetus" (Epstein, 2007, p. 154). Though there have been no large studies, small research studies have shown low numbers of birth defects, fetal malformations, and abnormalities. Unfortunately, exposure to chemotherapy during second and third trimesters heightens the risk for intrauterine growth restriction and low birth weight. Anorexia, nausea, and vomiting experienced by the mother in reaction to the chemotherapy may exacerbate the restricted

growth of her fetus (Cardonick & Iacobucci, 2004).

Serious dangers from chemotherapy in the first trimester include risk of miscarriage, major fetal abnormalities affecting the cardiac, nervous, and skeletal system, and neural tube defects (Cardonick, Iacobucci, 2004). Premature labor, intra-uterine growth restriction, and low birth weight have been noted with exposure in the second and third trimesters. Moran et al. (2007) found that often untreated cancer poses no risk to a pregnancy unless it proves to be terminal before the fetus can safely be delivered. Rarely will any type of cancer be able to metastasize through the placenta. Depending on the stage of cancer and time of diagnosis in the pregnancy, postponing all treatment until the postpartum period may be an option. For women concerned about the hazards posed to their baby, this is a popular choice (Dean, 2007).

Review of the Literature

In 2001, Gelber et al. investigated maternal and fetal outcomes in breast cancer patients compared to nonpregnant women. The International Breast Cancer Study Group (IBCSG) studied 94 pregnant patients at the onset of diagnosis. Using Cox proportional hazards regression models, they found a 92% 5 year survival and 86% 10 year survival rate for pregnant women. This was compared to the 85% and 74% respective survival rates for the non-pregnant comparison group. The IBCSG concluded that pregnant patients fared better with their cancer prognosis, possibly due to a healthy patient bias within the study or "an antitumor effect of the pregnancy" (Gelber et al., 2001). The study size was small and there was difficulty finding comparison patients, thus complicating the interpretation of the data. Out of the 137 pregnancies in conjunction with a diagnosis of breast cancer, 89 of the pregnancies resulted in live healthy births, one fetus was delivered as a stillborn, 12 miscarried, and 33 underwent therapeutic abortions, and two pregnancies had not yet delivered. The study concluded that pregnancy did not adversely affect cancer prognosis regardless of the treatment prescribed and in fact correlated a better outcome with pregnant patients (Gelber et al., 2001).

In 2007, Sekar & Stone analyzed the effects of Trastuzumab (Herceptin), a monoclonal antibody

targeted therapy prescribed for breast cancer. The effects on the fetus were unknown before the case study. They reported on one woman diagnosed with ductal carcinoma during gestation. She received two cycles after 20 weeks gestation. At her 30 week ultrasound, the fetus was found to be anhydramniotic. The fluid reappeared at 33 weeks after the treatment had been halted for nearly two months. The study reinforced the dangerous side effects of Trastuzumab. Treatment was halted until after delivery by caesarean section at 36 weeks. The major weakness in this case study is analyzing the sole patient and lacking a large subject population (Sekar & Stone, 2007).

Cardonick and Iacobucci (2004) studied the fetal effects of various classes of chemotherapeutic agents for breast cancer. Antimetabolites (including methotrexate, cyclophosphamide, mercaptopurine, vincristine, cytarabine, prednisone, and 5-fluorouracil) had adverse events such as spontaneous abortions, low birth weight, and fatalities related to pancytopenia, sepsis, and gastroenteritis when given in the first trimester. Hair loss, inguinal hernia, miscarriage, and intrauterine fetal death were noted in the first and second trimesters along with limb malformations. Alkylating agents produced structural and limb malformations, esophageal atresia, abnormal inferior vena cava, and intra-uterine growth restriction. Sixteen pregnant women were exposed and delivered at term with no apparent negative effects. Finally, anthracycline antibiotics were prescribed after the first trimester with reports of only one terminated pregnancy and two spontaneous abortions out of 28 total gestations. First trimester exposure problems included pre-eclampsia, miscarriage, neonatal neutropenia, sepsis, intra-uterine growth restriction, and intra-uterine fetal demise. This study, though limited once again by its retrospective nature and a limited sample size, reinforced that chemotherapy is most harmful during the first trimester. Certain agents carry less risk if postponed until the second trimester (Cardonick & Iacobucci, 2004).

Influences and Accommodations for Nursing Care

Women who receive simultaneous diagnoses of pregnancy and breast cancer are often overwhelmed and confused with their prognosis, the health of their

fetus, and their treatment options. These patients may have concerns regarding treatment, negative effects on the baby, or terminating their pregnancy. An unfavorable prognosis is particularly depressing, as a woman may need to consider future accommodations for her child. "Women who have been diagnosed with breast cancer during pregnancy may require additional support, both practical and emotional, and nurses and other healthcare professionals must be able to meet this demand" (Dean, 2007, p. 48).

Nurses providing care to pregnant breast cancer patients must ensure specific, thoughtful, and comprehensive care through an ethically difficult period. In addition to regular prenatal visits, a woman will have to coordinate oncology consults, and high-risk pregnancy doctor appointments. Nurses should facilitate visits conveniently for the patient. Communication between different care providers is essential to offering quality care; nurses must be conscious of contacting and interacting with these other healthcare offices. Nurses must realize that women have a sense of purpose by caring a child and this may be a powerful motivation to fight disease and participate in self-care. With this idea, nurse must be cognizant of the fear of life threatening illness and fears of putting their unborn child at risk. A nurse can suggest outside support by referring a woman to other professionals, organizations, support groups, and/or counselors (Dean, 2007). Since decisions regarding treatment are case-specific and ethically challenging, the nurse should offer up to date and current clinical advice, information, and foresight in regards to trimester of pregnancy, stage of disease, and options for care. Another nursing responsibility is offering support through the grieving process and providing referrals to counseling and psychological services for women who have devastating choices, such as termination, miscarriage, or a prognosis that would not allow for time to raise her child. Fatigue, nausea, anemia, and alopecia may continue the first few months after the pregnancy and affect how a woman can care for her infant. For women who start chemotherapy post-partum, nurses may arrange for a home health nurse to visit the mother and baby periodically.

Finally, a nursing duty includes reviewing current literature on this increasingly common scenario and to seek out evidence-based recommendations in an effort that the patient receives progressive care.

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