Pregnancy-Associated Breast Cancer

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Case Study

R.M., a 38-year-old woman, gravida 4, para 2, was 28 weeks pregnant. She was a busy mother of two active boys, aged 7 and 4, and was thrilled to learn she was expecting a baby girl. Her pregnancy had progressed normally, with common complaints of fatigue and heartburn. Her prior pregnancies were also without complications except for cesarean deliveries because of a breech presentation in her first pregnancy.

R.M. had a history of a benign breast cyst, so she was not overly concerned when she felt a quarter-sized painless lump in her right breast. She waited two weeks until her next scheduled office visit to mention the lump to her obstetrician. Her doctor performed a thorough breast examination and reassured her that the lump probably was a blocked milk duct. He suggested that she have an ultrasound to be sure. The ultrasound was inconclusive, so her doctor insisted on a fine needle biopsy to rule out any possibility of cancer.

Several days later, R.M. received devastating news: She had stage II invasive ductal carcinoma of the breast. After meeting with an oncologist, surgeon, and maternal fetal medicine doctors, she was scheduled for a modified radical mastectomy at 30 weeks. Her first round of chemotherapy would be at 32 weeks and second infusion at 35 weeks; her next treatment would be held to avoid complications of anemia or neutropenia in the infant. R.M. would then be scheduled for a repeat cesarean section at 37.5 weeks.

Pregnancy-Associated Breast Cancer

Pregnancy typically is viewed as a time of health and wellness, so the possibility of being diagnosed with cancer usually is far from a pregnant woman’s mind. Although uncommon, breast cancer is second to cervical cancer as the most commonly diagnosed cancer during pregnancy (Psyrri & Burtness, 2005). Pregnancy-associated breast cancer (PABC) occurs in about 1 in 1,000 to 3 in 10,000 pregnancies (Hahn et al., 2006). As many women delay childbirth until age 30–40, the incidence of PABC is expected to rise (Psyrri & Burtness). In the United States, about 3,500 cases of breast cancer are diagnosed in pregnant women every year (Hassay Dow, 2000). A first pregnancy at 30 years of age or older and advanced maternal age are known risk factors for breast cancer (Psyrri & Burtness). The rate for women in their 40s having a first pregnancy has increased steadily since 1984. The number of women aged 30–34 years having a first pregnancy in 1975 has increased from 53 per 1,000 to 92 per 1,000 in 1997 and first-time mothers aged 35–39 years have risen from 36 per 1,000 in 1990 to 44 per 1,000 in 1997 (Keleher et al., 2002).

Breast cancer is classified as “pregnancy associated” if it is diagnosed during pregnancy or within one year of delivery (Hahn & Theriault, 2008). About 3% of all breast cancers are diagnosed during pregnancy (Ring, Smith, & Ellis, 2005). The average age at diagnosis for patients with PABC is 32–38 years (Keleher et al., 2002). A painless mass is palpated by the patient in 90% of reported cases (Scott-Conner, 1999). The incidence of breast cancer is the same in pregnant women as nonpregnant women in the general population. The hormonal and immunologic changes in pregnancy were presumed to provide a favorable environment for the growth of breast cancer cells, but multiple studies have failed to prove the theory (Scott-Conner).

The physiologic changes that take place in the breast during pregnancy can contribute to a delay in the diagnosis of PABC. In preparation for lactation, a woman’s breast size will nearly double in size and weight. The influence of estrogen and progesterone cause an increase in blood flow and fat, resulting in an increase in the size of milk-producing glands. Some women may begin to leak colostrum by 25 weeks gestation. Irritation of the breast ducts caused by rapid tissue growth may cause a bloody discharge, which usually is a benign condition (e.g., cells in the lining of the breast ducts being shed, secretion from a papilloma) (Imaginis). The areola also may increase in size and become darker in color. In addition, Montgomery tubercles, small nodules surrounding the areola, will produce a fluid to lubricate and cleanse the nipple in preparation for nursing (Imaginis).

Breast Mass Assessment in Pregnant Women

A thorough baseline examination of the breast should be performed in the early stages of pregnancy before the physiologic changes are pronounced. Breast cancer most often presents as a painless lump or thickening, sometimes accompanied by a bloody discharge from the nipple (Eedarapalli & Jain, 2006). Palpating a mass is more difficult when the breast becomes...
engorged, and bloody discharge from the nipple often is dismissed as normal in pregnancy (Psyrri & Burtness, 2005); as a result, diagnosis and treatment often are delayed for two months or more (Hahn & Theriault, 2007). However, a delay of just one to two months can increase the chance of metastasis to the lymph nodes (Eedarapalli & Jain).

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Diagnosis

Diagnostic criteria for breast cancer are the same for pregnant and nonpregnant women. Triple assessment should be followed, starting with a thorough physical examination to assess for lumps and regional lymph nodes. The examination should be followed by a mammogram or ultrasound to determine whether the lump is a simple cyst or solid tumor. Ultrasound usually is the preferred diagnostic tool to differentiate benign cysts from solid tumors because the increased density of breast tissue in pregnancy makes mammograms less reliable (Hassey Dow, 2000). Breast magnetic resonance imaging has shown promise for improving accuracy in breast cancer diagnosis, but it has had limited use in pregnancy and is not recommended during the first trimester (Psyrri & Burtness, 2005). A fine needle biopsy should be done to determine the type of cancer; if the fine needle biopsy does not diagnose the disease, a core needle biopsy can be performed (Dean, 2007). The assessment will help stage the cancer and determine a treatment course. After breast cancer has been diagnosed, additional examinations are needed to stage the disease. Chest x-ray with abdominal shielding, a liver function test, and an assessment of estrogen and progesterone receptor status should be done. Bone scans should be performed only if suspicion exists for bone metastasis (Hassey Dow).

Treatment

A multidisciplinary approach is needed to care for pregnant women with breast cancer. Each patient and her family must be individually assessed to determine the need for support services, such as psychologists, social workers, and spiritual leaders, in addition to specialized maternal fetal medicine doctors and oncologists (Loibl et al., 2005). Psychological support is important to assist patients and families in making difficult treatment decisions and ensure that the treatment plan is followed. Some women may feel isolated, angry, and unable to express their fears; referral to peer support groups for women with cancer during pregnancy, such as Support for Cancer in Pregnancy (www.sfcp.org), may provide additional emotional support (Jack, 2006).

After a diagnosis of breast cancer has been made, treatment should not be delayed because of pregnancy. Surgery usually is the first step and can be done at any time without risk to the fetus (Hahn & Theriault, 2008). Modified radical mastectomy is the surgery of choice to avoid post-surgical radiation (Kelcher et al., 2002). Breast-conserving surgery may be considered if the woman is diagnosed in the late second or early third trimester and radiation can be started immediately after delivery (Hahn & Theriault). Axillary dissection should be performed because metastasis is common in PABC. The presence of cancer in the lymph nodes will determine what type of chemotherapy will be used and whether radiation will be needed in the future (Eedarapalli & Jain, 2006). Women diagnosed in the late stages of the third trimester can elect for early delivery, which allows for breast-conserving surgery and immediate radiation treatment (Hassey Dow, 2000).

Chemotherapy generally is not given during the first trimester because of high risk for spontaneous abortion and fetal malformations (Ring et al., 2005). Chemotherapy is less likely to cause fetal malformations in the second and third trimesters when organ formation is complete; however, close monitoring of the fetus is necessary because about 50% of fetuses in PABC will have intrauterine growth restriction, preterm delivery, or lower birth weights (Hahn & Theriault). Mothers often request a delay in the start of chemotherapy because of concern for their child, but delays of three to six months have shown an increase in the risk of metastasis from 5%–10% (Kelcher et al., 2002); therefore, nurses should review options with patients carefully and emphasize the importance of starting treatment promptly to improve outcomes. Chemotherapy should be stopped three to four weeks before the anticipated delivery to avoid myelosuppression, which can increase the risk for sepsis and hemorrhage for mothers and newborns (Ring et al.).

Radiation is used to treat localized areas of early breast cancer but is avoided in pregnancy; even with proper shielding of the abdomen, the fetus is exposed to therapeutic radiation and will be at risk for fetal malformations, hematologic disorders, and childhood malignancies (Hahn & Theriault).

Care of the Fetus

The pregnancy should be monitored to evaluate fetal tolerance of the treatment. Confirmation of gestational age and due date are significant factors for determining the plan of care. Abortion may be considered if the diagnosis is made in the first trimester (Hahn & Theriault, 2008). An ultrasound should be done before each cycle of chemotherapy to assess fetal growth (Loibl et al., 2006). If preterm delivery is necessary, amniocentesis can be performed to assess lung maturity. A vaginal delivery is preferred to avoid treatment delay after delivery. If chemotherapy is needed after delivery, breastfeeding is not recommended because most medications are excreted in milk (Loibl et al.).

The most frequently reported short-term effects in the fetus are anemia, alopecia, and neutropenia, which all are reversible; completing the last chemotherapy treatment three to four weeks before delivery can minimize those effects (Dean, 2007). Complete blood count results should be obtained and appropriate care given to avoid infection or bleeding complications, particularly if premature delivery occurs less than three weeks after the last chemotherapy treatment (Loibl et al.).

Follow-Up of the Child

A case-control study was conducted at the University of Texas M.D. Anderson Cancer Center to evaluate long-term effects on children exposed to chemotherapy.
in utero (Hahn et al., 2006). The study evaluated children aged two months to 13 years who were exposed to systemic chemotherapy for breast cancer during the second or third trimester of pregnancy. Of the 40 children who met the criteria, no increase in health or mental deficits were found versus control (Hahn et al.). A larger study of 84 children (median age = 18.7 years) born to women with hematologic cancer who underwent chemotherapy during their pregnancy looked at school records, physical and neurologic examinations, cardiac function, psychological evaluations, and bone marrow for chromosomal abnormalities. No abnormalities were found in physical growth or development; neurologic and psychological findings were normal and no cardiac issues were noted (Gwyn, 2005). Additional follow-up is needed to determine the lifelong effects (e.g., fertility, cardiac issues) in adulthood for the children (Hahn et al.).

Outcomes

Prognosis for PABC is unclear. Studies conducted at Memorial Sloan-Kettering in New York, NY, Mount Sinai School of Medicine in New York, and the Auckland Breast Cancer Study group in New Zealand have shown that stage-matched control groups of pregnant women to nonpregnant women had similar survival rates, but pregnant women often are diagnosed at later stages (Keleher et al., 2002). Larger studies in France and California found that pregnancy had a negative influence on outcomes, regardless of stage at diagnosis (MacReady, 2007). Researchers in both studies believed that circulating hormones in pregnancy and higher rates of the \textit{BRCA1} and \textit{BRCA2} genetic mutations in younger patients caused significantly poorer outcomes (Keleher et al.). The French study also found that conventional chemotherapy was less effective in patients with PABC, possibly because of tumor biology; additional studies are needed to verify the relationship (Keleher et al.).

Oncology Nursing Implications

Nurses caring for pregnant women must educate themselves and their patients about the signs and symptoms of breast cancer. A thorough examination should be completed on the first prenatal visit before physiologic changes to the breast occur. Nurses should review the expected changes with patients of any age and encourage them to report any unusual lumps or nipple discharge. Evaluation of breast masses or discharges should not be postponed until after delivery. Nurses often are patients’ main source of information within the health-care system; therefore, nurses should be able to assist patients or refer them to someone who can answer their questions. A breast cancer diagnosis during pregnancy can be particularly distressing, and patients may have difficulty coping with the range of emotions. Nurses should evaluate those patients’ psychological needs and encourage professional help when necessary (Rimes, Gano, & Milbourne, 2008).

PABC is rare, but an increase in incidence is expected as more women delay childbirth (Psyrri & Burtness, 2005). Caring for a pregnant woman with breast cancer presents many challenges for nurses. Pregnant women with PABC require a personalized approach to manage their treatment, and careful consideration for the mother and fetus is needed. Additional studies of the effects of pregnancy on breast cancer are needed to determine the most effective treatment plan. Working as a multidisciplinary team will help achieve the best possible outcomes for mothers and their babies (Gwyn, 2005).

Conclusion

R.M. received 5-fluorouracil, doxorubicin, and cyclophosphamide (FAC) at 32 weeks and 35 weeks gestation. She delivered a healthy baby girl at 37.5 weeks via cesarean section without complications. R.M. and her baby were discharged from the hospital on postpartum day four. After 14 days of recovery from surgery, R.M. continued chemotherapy with four more rounds of FAC followed by taxane. Radiation therapy was started to complement her treatment. To date, R.M. continues to have follow-up care every six months; she has been cancer free for two years.

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References