C.S., a premenopausal, 40-year-old, single, Hispanic woman with no children, was diagnosed in April 2006 with invasive adenocarcinoma by needle biopsy of her right breast. Pathology showed estrogen receptor (ER)-negative, progesterone receptor (PR)-negative, and HER2/neu-negative—triplet-negative breast cancer (TNBC). A magnetic resonance image of the breast showed a 3.5 x 2.5 x 3 cm round mass with irregular margins in the right breast at the 10 o’clock position. The mass was associated with pectoral muscle involvement with marked central necrosis with angiogenesis peripherally.

Neoadjuvant treatment started with adriamycin and cyclophosphamide and was to be followed by paclitaxel. C.S. completed four adriamycin and cyclophosphamide treatments, but marked progression of the breast mass on palpation was visibly noted (the lesion was very close to skin surface). One paclitaxel treatment was given with an obvious increase in the size of C.S.’s breast mass; therefore, she was switched to docetaxel. C.S. received three cycles of docetaxel, with the last dose occurring in December 2006. Radiation therapy was planned, but a computed tomography scan showed lung nodules which were positive for metastatic disease. C.S. was referred to the University of Texas M.D. Anderson Cancer Center in Houston for a clinical trial in January 2007 and placed on tipifarnib and gemcitabine. C.S. had issues with cytopenias and infections during the treatment protocol.

By April 2007, C.S. showed progression of her disease: Her breast mass was larger, and her pulmonary nodules had increased in size. She was placed on capecitabine and bevacizumab. A computed tomography scan in May 2007 showed a T12 osteoblastic lesion previously unseen. C.S. had a significant nose bleed in June 2007, possibly related to bevacizumab treatment, and she was switched to navelbine. By July 2007, her right breast mass was large and painful. C.S. was referred to the University of New Mexico Cancer Treatment Center in Albuquerque because of an interest in a phase I trial. She was admitted to the hospital on July 16, 2007, with pleural effusion, poor performance status, and pain. C.S. died on July 26, 2007, just 15 months after diagnosis.

**Overview**

An estimated 182,460 cases of breast cancer occurred in women in the United States in 2008, with 40,480 deaths (American Cancer Society, 2008). Breast cancer diagnosis often comes when a woman finds a suspicious lump, after a mammogram, or after an examination by a healthcare professional. After the lump has been verified via mammography, ultrasound, or magnetic resonance imaging, a biopsy is performed. If breast cancer is confirmed, tissue is sent for additional analysis to evaluate for hormonal receptor (ER and PR) and HER2/neu status. Prior to the advent of trastuzumab, hormone receptor status determined the course of additional treatment after completion of adjuvant or neoadjuvant chemotherapy. Hormonal status reviews ER and PR and reveals whether patients are ER-positive, ER-negative, PR-positive, or PR-negative. Hormonal treatment is an option if the patient is either ER- or PR-positive (see Figure 1). ER-negative and PR-negative patients have fewer treatment options.

Staging for breast cancer occurs after diagnosis and possibly after surgical intervention. At that point, patients may be referred to a surgeon, an oncologist, or both. Staging will include family history, a physical, laboratory testing (e.g., complete blood count, comprehensive metabolic panel, alkaline phosphatase), diagnostic bilateral mammogram, and ultrasound (National Comprehensive Cancer Network, 2008). Optional staging criteria include a breast magnetic resonance image, bone scan (if symptomatic), abdominal computed tomography scan (if abnormal liver function is noted), chest x-ray, or chest computed tomography scan.

Treatment decisions are made after staging has been determined. Treatment is based on adjuvant and neoadjuvant needs. Size of lesion, nodal status, and preference regarding breast conservation all help determine treatment options.

**Triple-Negative Breast Cancer**

TNBC accounts for about 10%–17% of all types of breast cancer (Reis-Filho & Tutt, 2008). Similarities are seen between TNBC and basal-like breast cancers (Reis-Filho & Tutt), so much so that some healthcare professionals consider them to be the same. Basal-like tumors can account for about 15% of breast tumors and also generally are ER-and PR-negative (some may have positive receptor status), HER2/neu-negative, and affect younger...
women (Reis-Filho & Tutt). Almost 85% of TNBCs are deemed to be synonymous to basal-like cancer when tested by immunohistocompatibility (Bauer, Brown, Cress, Parise, & Caggioppo, 2007).

Bauer et al. (2007) examined 6,370 patients who had TNBC and 44,704 patients with other breast cancers and found that patients with TNBC were diagnosed at a median age of 54 years compared to a median age of 60 years for the other breast cancer group. In addition, a significantly higher amount of African American and Hispanic women had TNBC compared to the other breast cancer group. Tumor size also was significantly larger in the TNBC group and patients often presented at a more advanced stage. Relative survival also was found to be poorer for women with TNBC, with 77% surviving five years compared to 93% with other breast cancers.

Mary Jo B. Lund, PhD, a researcher at Winship Cancer Center at Emory University in Atlanta, GA, examined tumor tissue from 117 African American and 362 Caucasian women from the Atlanta metropolitan area (Tuma, 2007) and found that, of the 29.5% of women who had TNBC, 47% were African American and 22% Caucasian. Lund also found that only 39% of African Americans (compared with 64% of Caucasian women) showed the most favorable prognostic indicators: ER-positive, PR-positive, and HER2/neu-negative. More than 50% of African American women younger than 40 had TNBC.

In a study of 482 patients with breast cancer by Haffty et al. (2006a), 117 (24%) had TNBC. As noted in other studies, younger women (aged 50 years or younger) were more likely to have TNBC (63%). Haffty et al. also found that 8 of 10 BRCA1 mutation patients had TNBC. Patients with TNBC also were found to have a stronger family history of breast cancer. Many patients with TNBC also were African American women and presented with higher pathologic stage. With median follow up of 7.9 years, results showed that, despite adjuvant chemotherapy, patients with TNBC had poorer prognosis, with only 71% being metastases-free at five years.

**Triple-Negative Breast Cancer Treatment**

Treatment for TNBC involves systemic chemotherapy. Adjuvant and neoadjuvant treatments often are done with an anthracycline regimen. Taxane use in TNBC still is under investigation, but speculation exists that TNBC does not show sensitivity to taxanes. Additional research is needed to determine efficacy (Reis-Filho & Tutt, 2008).

Research with chemotherapy and TNBC has shown that pathologic complete response is higher than in patients with non-TNBC (Liedtke et al., 2008). Patients with residual disease after neo-adjuvant chemotherapy showed significantly shorter survival time than patients with non-TNBC. Disease relapse also is higher in the first three years following diagnosis for patients with TNBC, but, after three years, the hazard curves run very close to each other for both groups. Keam et al. (2007) showed similar results in a trial of 145 stage II and III patients with breast cancer who received docetaxel and doxorubicin. Patients with TNBC (32.4%) showed higher response rates and higher pathologic response rates. However, the same TNBC patients also showed shorter relapse-free survival and overall survival.

Haffty et al. (2006b) evaluated treatment with radiation and conservaive surgery while analyzing locoregional relapse and distant metastasis. Results showed no difference between TNBC and other controls in relation to locoregional relapse. At five years, however, Haffty et al. did find that patients with TNBC had poorer distant metastasis-free rates than other patient subgroups. Results suggest that breast-conserving therapy is effective in this cohort of patients.

Because patients with TNBC often are treated with an anthracycline regimen and have poorer prognosis and overall survival, research is needed to evaluate new, more effective treatments. Trials are researching the use of bevacizumab before surgery, newer agents that interfere with certain cell signaling pathways, and platinum compounds (Reynolds, 2007). The Triple Negative Trial, a clinical trial directed at women with TNBC, is evaluating carboplatin and docetaxel in the United Kingdom (National Institutes of Health, 2008a). Ongoing chemotherapy trials, using agents such as gemcitabine and oxaliplatin; abraxane, bevacizumab, and carboplatin; weekly paclitaxel and carboplatin; cisplatin; gemzar and cisplatin; and erlotinib, are being conducted (National Institutes of Health, 2008b).

In addition, studies regarding genetic markers (e.g., HER2/neu, BRCA1, BRCA2, TP53) are ongoing. Cellular pathway signaling (e.g., K-ras, NK) also is an area being studied. These pathways may become alternative treatment paths if they are identified in patients with TNBC. If other markers are found, pharmaceutical agents may be developed to target the genetic variations.

**Implications for Nursing**

Patients with TNBC may present issues not seen in other patients with breast cancer. Because patients often are younger, possible issues may include dealing with time off from work and a loss of income, a review of life priorities, difficulties with having younger children at home, household chores, and school activities. In addition, patients may place more weight on body image, self-esteem, and possible chemotherapy-related hair loss.

Other implications may be related to patients’ lack of health care. Studies have shown that TNBC rates often are higher in African Americans, Hispanics, and women of a lower socioeconomic status (Reynolds, 2007); therefore, healthcare access may be hindered. Issues with access to clinical trials also may occur if healthcare coverage is minimal or nonexistent.

Nurses are instrumental in teaching and listening to patients with cancer. Nurses often hear of symptoms which may show progression of disease prior to physicians. Symptoms, such as increasing...
size of current tumor, more pain at tumor site, new bone pain or back pain, and shortness of breath, may implicate tumor growth, metastases, or pleural effusions (Haffty et al., 2006). Nurses should teach patients to report symptoms and adhere to suggested screening and follow-up appointments. Patients diagnosed with TNBC should monitor their health and complete scans and mammograms as ordered. Breast self-examinations and incisional or scar self-examinations should be taught to patients as a way to monitor for local recurrence.

Access to ancillary services may benefit this group. Assistance with work-related or disability forms may be needed. Referral to support groups may help patients deal with issues related to work, children, significant others, and body image. Referral to centers that conduct clinical trials may be indicated based on patient preference, time of recurrence, or time of progression. Nurses should be educated about local services or programs that can help patients with limited access to adequate health care, such as low-cost or free mammograms.

Conclusion

TNBC is a form of breast cancer that is accompanied by unique issues. TNBC often is found in younger patients, women of African American or Hispanic descent, and patients with lower socioeconomic status. TNBC cannot be treated with standard hormonal therapy or trastuzumab, and patients have a poorer prognosis and overall survival. Nurses are challenged to help this patient population move through the TNBC trajectory. Educating patients about the disease, treatment, how to monitor for symptoms of progression or recurrence, and the importance of follow-up care is at the root of oncology nursing.

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References


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