

# Cancer health disparities and risk factors: lessons from a woman with a 20-cm chest wall mass, growing for 2 years

Janghee Woo, MD, PhD,<sup>1</sup> Neil Palmisiano, MD,<sup>2</sup> and Gabor Varadi, MD<sup>1</sup>

<sup>1</sup>Department of Medicine, Braemer Cancer Center, Albert Einstein Medical Center; <sup>2</sup>Jefferson Kimmel Cancer Center, Thomas Jefferson University, Philadelphia, Pennsylvania

The National Cancer Institute (NCI) has defined cancer health disparities as adverse differences in incidence, prevalence, mortality, survivorship, and burden of cancer or related health conditions that exist among specific populations in the United States.<sup>1</sup> African Americans are more likely than members of any other racial or ethnic population to develop and die from cancer.<sup>2</sup> African American women are more likely than are white women to die of breast cancer, although African American women have a lower incidence rate of this disease than white women.<sup>3,4</sup> The most conspicuous factors that contribute to the observed disparities are associated with a lack of health care coverage, low socioeconomic status, and race/ethnicity. We recently provided care to a woman who presented to the emergency room with 20-cm chest wall mass. She was found to have inoperable stage IV triple-negative breast cancer with significantly poor prognosis. We describe her presentation, diagnosis, and treatment, identify the factors that contributed to her current condition, discuss the cancer health disparities and the associated risk factors, and reiterate what physicians should know to prevent similar unfortunate and unnecessary scenarios.

## Case presentation

A 38-year-old African American woman with no significant past medical or surgical history presented with a fungating and malodorous anterior chest wall mass that was more than 20 cm in size.

Manuscript received March 7, 2013; accepted March 11, 2013.

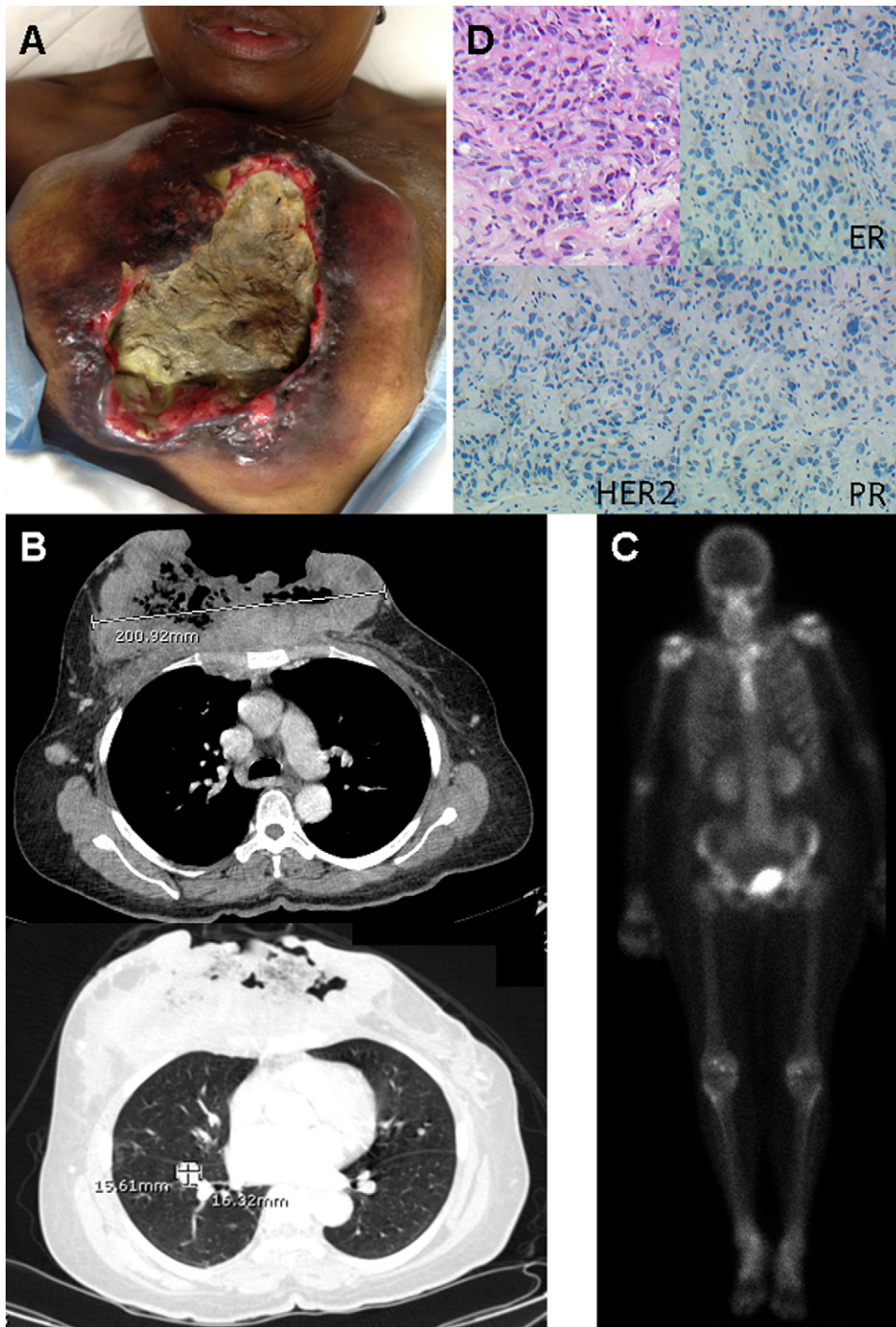
**Correspondence** Gabor Varadi, MD, Braemer Cancer Center, Albert Einstein Medical Center, 5501 Old York Road, Philadelphia, PA 19141 (VaradiG@einstein.edu); Janghee Woo, MD, PhD, Department of Medicine, Albert Einstein Medical Center, 5501 Old York Road, Philadelphia, PA 19141 (Woojangh@einstein.edu).

**Disclosures** The authors have no disclosures.

A small lump in the right breast had appeared about 2 years previously and had grown slowly over that period. The patient said she has not been able to seek medical attention owing to financial difficulties and a lack of health insurance. Two weeks before admission, the mass began ulcerating and subsequently discharged a foul smelling fluid and semisolid materials, which was why she had decided to come to hospital. A review of her other symptoms was unremarkable except for an unintentional 15-lb weight loss over the previous 2 months. She denied medical and psychological illness. However, an examination of her social history revealed that she was a former foster child who had suffered years of physical abuse in the child welfare system. She denied alcohol, smoking, or drug use and sexual activity. She was divorced and lived alone. She had recently started working as a part-time aid for a local school district. She denied family history of cancer, stroke, coronary artery disease and other illnesses.

On examination, the patient was found to be mildly febrile when she presented while all of her other vital signs were stable. The firm multilobular tumor was centrally ulcerated with an irregular surface and extended to bilateral chest walls and breasts (Figure 1A). Multiple small fixed and firm lymph nodes were palpated in bilateral axillae. Computed tomography scan of her chest, abdomen, and pelvis revealed a large, necrotic, solid mass of about 20 cm high x 20 cm wide x 9 cm deep in the anterior chest wall and that had originated from the right breast. Multiple bilateral lung nodules were identified. There was no evidence of metastasis in the abdomen and pelvis (Figure 1B). Magnetic resonance imaging of the brain showed no evidence of brain metastasis, and a bone

Commun Oncol 2013;10:154-158 © 2013 Frontline Medical Communications  
DOI: 10.12788/j.cmonc.0027



**FIGURE 1** A, Patient tumor photograph following bedside debridement. B, CT of the chest revealed 20-cm necrotic mass, originating from right breast (upper). Multiple bilateral lung nodules, around 10 nodules including the largest in the superior segment of the right lower lobe, measuring  $1.6 \times 1.6$  cm were found (lower). C, Bone scan disclosed mild increased uptake at the sternomanubrial joint where the tumor extended but failed to find any evidence of metastasis to the bones. D, Tumor histopathology: H&E, ER, PR, HER2 immunohistochemistry.

scan showed mild increased uptake at the sternomanubrial joint where the tumor extended but failed to show any evidence of metastasis to the bones (Figure 1C). A core biopsy of the tumor revealed estrogen receptor-, progesterone receptor-, and human epidermal growth factor receptor 2-negative invasive ductal carcinoma (Figure 1D). The HIV serology test result was negative, but the result of the CA 27-29 blood test for cancer antigen was elevated, at 1,147 U/mL (normal, 38 U/mL). A final diagnosis of stage IV triple-negative invasive mammary ductal carcinoma was made. We resolved the patient's mild leukocytosis with fever with a short course of antibiotic therapy, and wound care continued.

A psychiatric evaluation disclosed mild depression associated with a protracted history of emotional and physical abuse and poor familial and social support. Otherwise the patient had no significant psychological disorders and found to have appropriate competency for decision-making. The patient was discharged with follow-ups in oncology, breast surgery, radiation oncology, and psychiatry. The patient navigator program closely communicated with the patient and arranged multidisciplinary appointments as well as transportation to prevent loss of follow-ups. Definite treatment was delayed more than 2 weeks until Medicaid under breast and cervical cancer prevention and treatment was approved. Despite that delay, wound care and home health care service continued. Therapeutic debridement was performed subsequently and systemic chemotherapy (doxorubicin, cyclophosphamide, and paclitaxel) was initiated with palliative intent. However, given locally advanced disease with bilateral lung metastasis, the prognosis is expectedly poor.

### Cancer health disparities and risk factors

If they patient had received appropriate medical care from the time the patient first noticed the lump in her breast, she would most likely have lived without significant physical defects and the emotional trauma from her disfiguring lesion. This case illustrates a cancer health disparity, as defined by the NCI, within the current health care system. Disparities in death rates for breast cancer patients are evident by state, socioeconomic status (SES), and race or ethnicity.<sup>5</sup> Differences may also be due in part to lifestyle choices, cultural habits, environmental exposures, and the endogenous genetic characteristics of cancer cells. As seen in the patient of this case, the treatment delay, worse clinical outcomes, and the associated cancer health disparities could have been multifactorial, including contributions from genetic factors, limited social support, poor self-esteem from past abuse, fear of what an investigation of the lump could represent, insufficient access to the health care system because of a lack of health insurance and low socioeconomic status. The following dis-

cussion will focus on details of the contributing factors to the cancer health disparities.

From 2004 to 2008, the average annual incidence rate of female breast cancer was highest in non-Hispanic white women (125.4 cases per 100,000 women) and lower in African American women (116.1 cases per 100,000). From 2003 to 2007, however, the average annual death rate from female breast cancer was highest in African American women (32.4 deaths per 100,000) and lower in non-Hispanic white women (23.9 deaths per 100,000). During 2001-2007, the 5-year cause-specific survival rate was highest in non-Hispanic white women (88.8%) and lowest in African American women (77.5%) among all races and ethnicities. The higher death rate among African American women – despite their lower incidence rate – compared with non-Hispanic whites, is a result of their being diagnosed at a later stage and their poorer stage-specific survival.<sup>5</sup> In particular, basal-like triple-negative breast cancers, which have a poorer prognosis than any other subtype of breast cancer, were more prevalent among premenopausal African American women than among postmenopausal African American and non-African American patients. The higher prevalence of triple-negative breast cancer in African Americans may contribute to the poor prognosis for young African American women with breast cancer.<sup>4,6</sup> However, the incidence rates of breast cancer in African American women varies by state. Breast cancer death rates in African American women also vary by state, ranging from 19.9% of all breast cancer cases in Oregon to 38.0% in Tennessee. These statistics indicate the presence of significant contributing factors other than genetics.

Siegel and colleagues have suggested that differences in SES are the main causes of racial disparities in cancer mortality.<sup>2</sup> For example, analyses of county-level poverty rates have shown that the decrease in mortality rates was slower among women residing in poor areas. In a study by Smigal, the rates of having a mammogram varied by race and ethnicity and were markedly lower among women with lower levels of education, those without health insurance, and among recent immigrants.<sup>3</sup> Screening rates continue to be lower in poor women. A 2008 study found that 51.4% of poor women had undergone a screening mammogram in the previous 2 years, compared with 72.8% of other women.<sup>4</sup> Furthermore, a study in Chicago in 2007 found that facilities that served mostly minority women were less likely to be academic or private institutions ( $P < .03$ ), less likely to have digital mammography ( $P < .003$ ), and less likely to have dedicated breast-imaging specialists to read the films ( $P < .003$ ).<sup>7</sup> Another study found that African American women experienced a clinically significant longer delay than did white women

in the diagnosis and treatment of breast cancer.<sup>8</sup> Mam-mographic history, insurance status, and SES (poverty) mainly accounted for the delay.<sup>8</sup> These results suggested that differences in both the screening rate and the quality of mammographic screening as well as delayed follow-up for abnormal mammographic findings may contribute to the mortality disparity in different races and SES. One epidemiological analysis stated that 37% of the premature cancer deaths in the United States could have been avoided if everyone had experienced the same overall death rates from cancer as the most educated non-Hispanic whites, which statistically removed racial and SES differences in the population.<sup>5</sup> This analysis underscores the dominant role of poverty and SES in cancer disparities.

Other factors also significantly contribute to cancer health disparities: presence of mental illness, disease comorbidity, and lack of social support. Our patient had been a foster child and had suffered years of physical abuse in the child welfare system. She lacked interaction with the community and was isolated from society, although a careful psychiatric evaluation failed to reveal significant psychiatric disorders other than minor depression. Koroukian and colleagues have reported that women with mental illness were 32% less likely to undergo at least 1 screening mammography, and of those who did, fewer women with mental illness received screening mammography on an annual basis (5.9% vs 12.7%,  $P < .001$ ), which may lead to poorer outcomes in patients with mental illness.<sup>9</sup> Nonadherence to treatment regimens, a lack of understanding of the disease, psychiatric complications, physician frustration, difficulty of communication, and a lack of self-respect and social support are some of the barriers that can challenge the diagnosis and treatment in patients with both mental illness and breast cancer.<sup>10</sup> In particular, the lack of understanding of the disease, low self-esteem, and minimal social support may in part account for why this patient did not seek medical attention for such a long period of time.

Other comorbidities such as diabetes and obesity can affect breast cancer incidence and mortality. For example, black diabetic patients have an increased risk of developing breast cancer (odds ratio, 3.89; 95% CI, 1.66-9.11), compared with nondiabetic white women.<sup>11</sup> Diabetes is associated with a modestly increased mortality (hazard ratio, 1.65; 95% CI, 1.18-2.29), and that association is stronger in women who were obese at the diagnosis of breast cancer (HR, 2.49; 94% CI, 1.58-3.93)<sup>11</sup>. A meta-analysis of 43 studies<sup>12</sup> showed poorer survival among obese women with breast cancer than with nonobese women with breast cancer, which was similar for overall cancer survival (HR, 1.33; 95% CI, 1.21-1.47) and breast-cancer specific survival (HR, 1.33; 95% CI, 1.19-1.50).

Finally, social support from family members, friends, and/or neighbors is an important factor in determining prognosis and mortality. For example, the overall risk of mortality was found to be 24% higher for men and 20% higher for women who lived in the most deprived neighborhoods than it was for those living in the least deprived neighborhoods.<sup>13</sup> Breast cancer was one of the cancers that showed differences in mortality.<sup>13</sup> Another study found that higher levels of social support were associated with increased mental health and quality of life among African American patients with breast cancer, and that those patients might benefit from interventions aimed at increasing social support.<sup>14</sup>

## Conclusions

The circumstances of the case we present here should serve as a reminder to health care providers to be more vigilant of the extensive needs of the underserved and to offer appropriate care and support. Genetic predisposition to aggressive breast cancers; the presence of mental illness and other comorbidities; the lack of social support and low SES, which is also associated with a lower rate of annual mammography, inadequate quality of screening, delay in diagnosis and treatment, and the lower level of education, can all contribute to the cancer health disparities, as with our patient. The continued presence of disparities in cancer diagnosis and treatment warrants more dedicated and sustained efforts to provide underserved populations with better access to high quality health care and health care support. These efforts should include an increase in the availability of health information and health insurance coverage, measures for prevention, early diagnosis and treatment without significant delay due to socioeconomic issues.

However, delays in diagnosis and treatment can be caused by both patients and health care providers. Delays by the patient are associated with older age at the presentation, whereas a younger age at presentation is a high-risk factor for delays by providers due to a lack of clinical attention and the low diagnostic value of mammographies for younger women.<sup>15,16</sup> Annual mammographies for asymptomatic women 40 years of age or older and clinical breast examinations for women 20 years of age or older are the most important steps physicians can take to substantially reduce the incidence of breast cancer and related mortality.<sup>5</sup> Physicians should also pay more attention to identifying patients who are at high risk of breast cancer, offer age-appropriate screening (mammography after the age of 40, ultrasound for younger women and MRI for high-risk patients with history of chest radiation at the age of 10 to 30, genetic mutations such as *BRCA1/2* or first-degree relative of *BRCA* carrier), and establish timely

follow-ups with proper genetic counseling, if indicated, to avoid preventable deaths by not identifying high-risk patients. Physicians should be aware of the resources available to cancer patients, such as financial aid and patient navigator programs, and have social services, care management and psychiatrists involved early in patient care to provide timely care and appropriate support.

### Acknowledgment

We thank Maneerat Chayanupatkul, MD; Lakshmi Kannan, MD; Emily Cranston, DO; Lisa Breitmayer, RN; Jill Lefkowitz; and the Breast Cancer Treatment Group at Einstein Women's Center and Cancer Center who have been involved in the care and treatment of the patient.

### References

1. National cancer Institute Web site. *Cancer Health Disparities*. <http://www.cancer.gov/cancertopics/disparities>. Accessed March 1, 2013.
2. Siegel R, Ward E, Brawley O, Jemal A. Cancer statistics, 2011: the impact of eliminating socioeconomic and racial disparities on premature cancer deaths. *CA Cancer J Clin*. 2011;61(4):212-236.
3. Smigal C, Jemal A, Ward E, et al. Trends in breast cancer by race and ethnicity: update 2006. *CA Cancer J Clin*. 2006;56(3):168-183.
4. Morris GJ, Mitchell EP. Higher incidence of aggressive breast cancers in African American women: a review. *J Natl Med Assoc*. 2008;100(6):698-702.
5. DeSantis C, Siegel R, Bandi P, Jemal A. Breast cancer statistics, 2011. *CA Cancer J Clin*. 2011;61(6):409-418.
6. Carey LA, Perou CM, Livasy CA, et al. Race, breast cancer subtypes, and survival in the Carolina Breast Cancer Study. *JAMA*. 2006;295(21):2492-2502.
7. Ansell D, Grabler P, Whitman S, et al. A community effort to reduce the black/white breast cancer mortality disparity in Chicago. *Cancer Causes Control*. 2009;20(9):1681-1688.
8. Gwyn K, Bondy ML, Cohen DS, et al. Racial differences in diagnosis, treatment, and clinical delays in a population-based study of patients with newly diagnosed breast carcinoma. *Cancer*. 2004;100(8):1595-1604.
9. Koroukian SM, Bakaki PM, Golchin N, Tyler C, Loue S. Mental illness and use of screening mammography among Medicaid beneficiaries. *Am J Prev Med*. 2012;42(6):606-609.
10. Cole M, Padmanabhan A. Breast cancer treatment of women with schizophrenia and bipolar disorder from Philadelphia, PA: lessons learned and suggestions for improvement. *J Cancer Educ*. 2012;27(4):774-779.
11. Cleveland RJ, North KE, Stevens J, Teitelbaum SL, Neugut AI, Gammon MD. The association of diabetes with breast cancer incidence and mortality in the Long Island Breast Cancer Study Project. *Cancer Causes Control*. 2012;23(7):1193-1203.
12. Protani M, Coory M, Martin JH. Effect of obesity on survival of women with breast cancer: systematic review and meta-analysis. *Breast Cancer Res Treat*. 2010;123(3):627-635.
13. Sundquist J, Li X, Sundquist K. Neighborhood deprivation and mortality in individuals with cancer: a multilevel analysis from Sweden. *Eur J Cancer Prev*. 2012;21(4):387-394.
14. Matthews AK, Tejada S, Johnson TP, Berbaum ML, Manfredi C. Correlates of quality of life among african american and white cancer survivors. *Cancer Nurs*. 2012;35(5):355-364.
15. Montella M, Crispo A, D'Aiuto G, et al. Determinant factors for diagnostic delay in operable breast cancer patients. *Eur J Cancer Prev*. 2001;10(1):53-59.
16. Ramirez AJ, Westcombe AM, Burgess CC, Sutton S, Littlejohns P, Richards MA. Factors predicting delayed presentation of symptomatic breast cancer: a systematic review. *Lancet*. 1999; 353(9159):1127-1131.