Epidemiology of Metastatic Breast Cancer to Bone: The Persistence of Racial Disparity in Survival Outcomes

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INTRODUCTION:

Early detection with screening methods and better healthcare resources have been implemented to improve breast cancer survival rates, especially with clear differences that have been identified in mortality rates between different racial and ethnic groups. While hormone-targeted breast cancer treatments have significantly improved mortality rates, metastatic lesions to the bone still portend poor prognosis. This study aimed to better understand if these racial and demographic disparities continue to persist and evaluate the survival outcomes in patients with breast metastases to bone.

METHODS:

The Surveillance, Epidemiology, and End Results Program (SEER) database was reviewed for patients diagnosed with metastatic breast cancer to the bone from 2016-2020. Inclusion criteria consisted of patients with known primary breast cancer, known hormone receptor status, and no known other cancer diagnoses. Demographic information, tumor characteristics, and treatment modalities were collected from the database. Statistical analysis was performed.

RESULTS:

In this study, 5,637 patients (98.7% female) met inclusion criteria. Demographic characteristics of patients were categorized as 74.2% White, 14.9% Black, 9.2% Asian or Pacific Islander, 0.9% American Indian/Alaska Native, 0.7% Unknown. In total, 86.6% were non-Spanish/Hispanic/Latino. 21.3% of patients were less than 50 years old at diagnosis, 37.6% of patients were 50-64, and 41.2% were 65 years and older. Increasing age was associated with decreased survival likelihood (OR: 2.120, 3.306 $p<0.001$). Some 83.0% of patients had positive estrogen receptor (ER+) status, 67.7% had positive progesterone receptor (PR+) breast cancer, and 22.8% had positive human epidermal growth factor 2 (HER2+) receptor breast cancer. An ER- status was significantly associated with higher rates of mortality (OR: 3.638, $p<0.001$), as did a PR- status (OR: 1.566, $p<0.001$). There was no statistical significance in overall survival in Her2 receptor status. Only having metastatic lesions in the bone was associated with better survival than metastases to other locations (OR: 0.467, $p<0.001$).

No statistically significant association was identified between race when compared to survival rates at 1-month, 3-month, 6-months, and 12-month follow up. Patients with incomes greater than $75,000 had higher likelihood of survival (OR: 0.800, $p=0.008$). When the analysis was stratified by race and income, Asian and Pacific Islander patients with an income greater than $75,000 had significantly lower mortality rates at a follow up of 6-months and 1-year (OR: 0.718, $p=0.025$; OR: 0.671, $p=0.003$, respectively). Non-Hispanic patients with an income greater than $75,000 were associated with better survival rates only at the 6-month follow up (OR: 0.836, $p=0.011$). However, at income levels greater than $75,000, Black patients that were 65 years and older were associated with significantly higher mortality rates at 6 months and 1 year when compared to White patients (OR: 1.644, $p=0.023$; OR: 1.651, $p=0.013$, respectively).

DISCUSSION AND CONCLUSION:

Tumor characteristics such as hormone and growth factor receptor status have been shown to improve survivability due to better targeted treatment strategies. Despite improved treatment methods, breast cancer with bone metastases continues to have poor long-term prognosis; this research reveals possible demographic and socioeconomic factors impacting mortality rates in these patients. This research highlights the importance that despite having the same income levels, Black patients in the 65 years and older cohort were the only group to have significantly higher mortality rates at 6-months and 1-year. Further research must be conducted to understand the interplay between these socioeconomic variables and survival likelihood in metastatic breast cancer.