Understanding Disparities Driving Breast Cancer Survival and Reconstruction Outcomes: A Population Based Analysis

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Introduction
• Although African American women (AAW) have a lower incidence of breast cancer, survival remains poor among AAW compared with Caucasian women (CW).
• While tumor biology, hormonal receptor status, and genetics are established factors associated with survival, socioeconomic and racial factors influencing outcomes remain poorly understood.
• The objective of our study is to evaluate the impact of race and type of health care coverage on survival and receipt of reconstruction in a contemporary cohort of patients with breast cancer.

Methods
• Patients who underwent breast conserving surgery or mastectomy for invasive ductal and lobular carcinoma from 2007 to 2014 were identified using the Surveillance Epidemiology End Results (SEER) registry.
• Patients were stratified into four groups based on race and insurance status: CW-Insured, AAW-Insured, CW-Medicaid, and AAW-Medicaid.
• Overall and disease specific survival was calculated using Kaplan-Meier method and compared using log-rank test.
• Multivariate Cox regression was performed to identify predictor of survival.
• Multivariate logistic regression was performed to identify factors associated with breast reconstruction following mastectomy.

Table: Multivariate Cox Survival Analysis

<table>
<thead>
<tr>
<th></th>
<th>HR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (per year)</td>
<td>1.03</td>
<td>1.03-1.071</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CW-Insured</td>
<td>Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CW-Medicaid</td>
<td>1.34</td>
<td>1.23-1.61</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>AAW-Insured</td>
<td>1.61</td>
<td>1.38-1.87</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>AAW-Medicaid</td>
<td>1.79</td>
<td>1.50-2.35</td>
<td>&lt;0.001</td>
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<tr>
<td>Chemotherapy</td>
<td>0.92</td>
<td>1.90-2.48</td>
<td>0.120</td>
</tr>
<tr>
<td>ER Positive</td>
<td>1.03</td>
<td>0.82-1.28</td>
<td>0.793</td>
</tr>
</tbody>
</table>

*Grade, T-stage, and nodal status all P<0.001

Results
• A total of 65,168 patients underwent surgery for breast cancer, 10% of whom were AAW and 7% had Medicaid health care coverage.
• The median age was 64 years.
• Stratified by race and insurance status, post-mastectomy reconstruction was more commonly performed among CW-insured compared with AAW-insured, CW-Medicaid, and AAW-Medicaid (44% vs. 37% vs. 30% vs. 27%, respectively; P<0.001).
• Incrementally higher T-stage and N-stage were observed among AAW-Medicaid and CW-Medicaid compared with the other groups.
• HER+ and ER+ tumors were more common among CW compared with AAW regardless of type of insurance status (P<0.001).

Figure: Disease Specific Survival based on (A) Race  (B) Insurance  (C) Race and Insurance

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• The five-year survival was significantly higher among CW-Insured compared with AAW-Insured (87.2% vs. 84.2%; P<0.001) while CW-Medicaid had worse 5-year survival compared with AAW-Insured (79.6% vs. 84.2%; P<0.001).
• Furthermore, the 5-year survival was comparable between CW-Medicaid and AAW-Medicaid groups (79.6% vs. 77.3%, P=0.246).
• On multivariate survival analysis after adjusting for age, stage, and tumor factors, both race and insurance status were independent predictors of poor disease specific survival (AAW-Insured HR 1.34, CW-Medicare HR 1.61, and AAW-Medicare HR 1.79, all P<0.001).
• Multivariate logistic analysis revealed that both race and type of health care coverage were the strongest independent risk factors associated with no breast reconstruction post-mastectomy.

Conclusion
• This study demonstrates that access to care is an important prognostic factor in determining mortality among patients with a diagnosis of breast cancer as well as in the ability to obtain post-mastectomy reconstruction. Adequate healthcare coverage is vital in order to improve the quality of care delivered to breast cancer patients.