Contributing Factors to the High Breast Cancer Death Rates among Black Women in Louisiana

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NAACCR Annual Meeting, Quebec, QC, Canada, 2010

Background

• Breast cancer death rates have decreased in the past 15 years among both white and black women in the US.

• In Louisiana, decreases in breast cancer death rate occurred among white women only; the death rate among black women remains stable.

• Breast cancer death rates were 64% higher among blacks than whites in Louisiana in 2003-2007; much higher than in the US (40% higher).

Breast Cancer Death Rates by Race and Year

Louisiana vs. US

Year of Death

Breast Cancer Death Rates by Race and Year

Louisiana vs. US

Background

• Associated factors with elevated breast cancer death rate
  - high incidence rate
  - late diagnosis
  - aggressive tumor characteristics
  - treatment
  - comorbidity

Background

• Incidence rates: 118 per 100,000 (whites) vs. 122 per 100,000 (blacks) in Louisiana, 2003-2007

• Advanced stage (regional + distant): 30% (whites) vs. 40% (blacks) in Louisiana, 2003-2007

• Tumor aggressiveness: Blacks were more likely than whites to have more aggressive breast cancers (ER/PR negative, high grade, Her2 positive)

Background

• Treatment: Blacks were less likely to receive guideline-concordant care than whites for surgery, radiation, and hormone therapy according to 1997 data collected through the CDC-NPCR POC 1 study.

• Comorbidity: Blacks were more likely to have a higher comorbidity score than whites.

• The CDC POC BP study provided an opportunity to do this analysis with more current and complete information.
Objectives

- Determine contributing factors to the higher breast cancer death rate in blacks than whites in Louisiana.
- Identify target areas for reducing racial disparity in breast cancer death.

Methods

- Data from the CDC-NPCR funded Patterns of Care study (CDC POC BP).
- 1,727 in situ and invasive female breast cancers (first primary) diagnosed in 2004. Cases randomly selected through race-stratified random sampling.
- Data were abstracted from hospital medical records and verified with treating physicians.

Methods

- Follow-up and census tract-level socioeconomic status (SES) supplemented to the analytic data set.
- Socioeconomic measures at census tract-level from the 2000 US Census:
  - poverty: <20 or 20%+/ persons under poverty level
  - education: <25% or 25%+/ no high school education
  - working class: <66% or 66%+ working class persons
  - residence: urban, rural, and mixed

Methods

- Chi-square test, Kaplan-Meier method, and Cox proportional hazards regression were used (significant level p<0.05).
- All causes survival were examined (14% unknown cause of death).
- SAS-callable – Sudaan 10.0.1 was used to analyze the weighted data.

Results

- 1,004 whites and 723 black breast cancer cases.
- Compared with whites, blacks were younger, more likely to be unmarried, live in urban, and areas with high poverty and working class and low education.
- Blacks were less likely to have private insurance and more likely to have public or no insurance.

Racial Differences in Socioeconomic Characteristics
Breast Cancer, Louisiana, 2004
Results
- Blacks were more likely to be diagnosed at late stage and have large size and aggressive tumors.
- 50% of breast cancers detected by mammogram screening in whites but only 41% in blacks.

Results
- About 20% blacks received breast conserving surgery (BCS) without radiation or had no surgery; much higher than 12% in whites.
- Blacks were more likely than whites to receive multi-agent chemotherapy and less likely to receive hormone therapy.

Racial Differences in Receiving Guideline Adjuvant Therapy.\(^1\) Breast Cancer, Louisiana, 2004

Chemotherapy Guidelines
- Localized: Chemo for those under age 70 with tumor $\geq 1$ cm or age 70 + with tumor $\geq 1$ cm and comorbidity score $\geq 0$
- Regional: Chemo for all under age 70 or those age 70+ with comorbidity score $= 0$

Hormone therapy Guidelines:
- ER or PR positive localized and regional tumors

Results
- The 5-year overall survival rate was 73% in blacks; much lower than 81% in whites.
- The Hazard ratio of blacks vs. whites was 1.71 after adjusting for age.
- All the socioeconomics, stage, tumor characteristics, and treatment were statistically significantly associated with the risk of all-cause death.
Black-White Differences in Risk of All-Cause Death

<table>
<thead>
<tr>
<th>Variables in the model</th>
<th>Hazard Ratio of blacks to whites (95% CI)</th>
<th>% decreases in Hazard Ratio from Model 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1: Race + Age</td>
<td>1.71 (1.40 – 2.10)</td>
<td></td>
</tr>
<tr>
<td>Model 1 + SES(^1)</td>
<td>1.49 (1.17 – 1.88)</td>
<td>13%</td>
</tr>
<tr>
<td>Model 1 + Insurance(^2)</td>
<td>1.42 (1.15 – 1.75)</td>
<td>17%</td>
</tr>
<tr>
<td>Model 1 + Marital status(^3)</td>
<td>1.56 (1.27 – 1.92)</td>
<td>9%</td>
</tr>
</tbody>
</table>

\(^1\) Census-level poverty, education, and working class as well as urban/rural
\(^2\) Private insurance: private only, private + supplement to public insurance.
\(^3\) Public insurance: Medicare, Medicaid and other federal or state funded insurance
\(^3\) Married, single, others and unknown

Discussion

- The high risk of all-cause death among black breast cancer patients was attributable to multiple factors: socioeconomics, clinical factors, and treatment.

Tumor characteristics contribute significantly to the low survival among blacks than whites.
- Percentage of large size, high grade, and receptor negative tumors were higher in blacks than whites.
- Increase early detection of breast cancer.
- Increase the awareness of importance to breast cancer early detection at community level.
Discussion

- The 1st course treatment contributed significantly to the black-white differences in risk of all-cause death is
  - Increase radiotherapy after BCS
  - Reduce pre-mature termination and low doses of chemotherapy
  - Increase use of hormone therapy for hormone receptor positive tumor

• Comorbidity contributed to the black-white differences in the risk of all-cause death. The contribution was smaller than all other factors.

• Health insurance was an important factor. It may be related to education, access to care, and barriers for early detection and compliance with the guideline therapy.