Impact of Treatment and Socioeconomic Status on Racial Disparities in Survival among Older Women with Breast Cancer

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Background

- **Racial/Ethnic disparities in breast cancer mortality in the U.S**

- **Higher breast cancer mortality in African-Americans than Caucasians attributed to:**
  - **More aggressive tumors**
  - **More advanced stage at diagnosis**
  - **Differences in health insurance and access to care**
  - **Differences in screening-early detection**
  - **Differences in receiving optimal treatments**
  - **Healthcare providers (physicians and hospitals)**
  - **Socioeconomic status (SES)**

Evidence of Racial/Ethnic Disparities in Healthcare
Consistent Findings

- Disparities across wide range of diseases and clinical services

- Disparities across clinical settings, including public and private hospitals, teaching and non-teaching hospitals, etc.

- Disparities when clinical factors, such as stage/severity of disease, co-morbidities, and age taken into account

- Since disparities in health care are associated with poor outcomes – they are not acceptable

Evidence of Racial/Ethnic Disparities in Mortality/Survival
Inconsistent Findings

- Racial/ethnic disparities remain after controlling for demographic variables, SES, access to care, comorbidities and treatment in several studies

Whereas

- Other studies found similar outcomes (survival) between racial/ethnic groups, after controlling for treatment and SES

Study Population and Methods

- **Large population-based cohort**
  - **35,029 women**
  - **stage I-IIIA breast cancer**
  - **age ≥65**
  - **1992-1999**
  - **identified from the from the NCI's SEER-Medicare data**
  - **11 SEER regions (covering >14% of the U.S. population)**

- **Last follow-up: 12/31/2002 with up to 11 years of follow-up**

- **>98% completeness of case ascertainment (incident cases)**

Study Variables

- **Outcomes**
  - **All-cause mortality**
  - **Breast cancer-specific mortality**
  - **Time to event (in months from date of diagnosis to date of death or date of)**

- **Exposures**
  - **Demographics (e.g. age, marital status, etc.)**
  - **Other covariables**
  - **Comorbidity score adjustment (created from Medicare claims)**
  - **Stage I-IIIA**
  - **Year of diagnosis (1992 to 1999)**
  - **Geographic areas (11 areas)**
  - **Race/ethnicity: African-American, Caucasian and Other**
  - **SES**
  - **Treatment**

Results

- **Age**
  - **Age distribution among racial/ethnic groups (Caucasian, African-American, and Other) similar**

- **Stage**
  - **Stage at presentation similar between Caucasian and other races**
  - **African-Americans more likely than Caucasians to present with stage II (46 vs. 37%) or stage IIIA (6 vs. 3%) breast cancer**

- **Comorbidity**
  - **Similar among Caucasians and other races**
  - **25% African-Americans score of 2+ compared to 13% of Caucasians**

Results

- **Treatment**
  - **Frequency of BCS (with & without radiotherapy), mastectomy, and chemotherapy similar among Caucasians and other races**
  - **African-Americans less likely to receive radiotherapy along with breast conserving surgery (33% vs. 37%)**

- **SES**
  - **African-Americans much more likely to live in census tracts with high poverty (76%) than Caucasians (21%) or other races (38%)**
  - **There was a similar finding when using SES composite score (poverty, education and income)**

Table 1. Hazard ratio of mortality by socioeconomic status

SES	Hazard ratio (95% confidence interval) of mortality*			
	All-cause mortality		Breast cancer-specific mortality	
	Model-1	Model-2	Model-3	Model-4
1st (high)	1.0	1.0	1.0	1.0
2nd	1.00 (0.95-1.06)	1.01 (0.96-1.06)	0.87 (0.75-1.00)	0.86 (0.75-1.00)
3rd	1.06 (1.01-1.12)	1.07 (1.01-1.13)	1.01 (0.88-1.17)	1.00 (0.87-1.16)
4th (low)	1.10 (1.04-1.16)	1.11 (1.05-1.18)	1.04 (0.91-1.20)	1.01 (0.87-1.17)

Models 1/3 adjusted for demographic, tumor and treatment factors.
Models 2/4 adjusted for race/ethnicity in addition to these factors.

Table 2. Hazard ratio of mortality by treatment

Primary therapy	Hazard ratio (95% confidence interval) of mortality*			
	All-cause mortality		Breast cancer-specific mortality	
	Model-1	Model-2	Model-3	Model-4
BCS only	1.00	1.00	1.00	1.00
BCS+ radiotherapy	0.50 (0.47-0.53)	0.50 (0.47-0.53)	0.57 (0.47-0.68)	0.57 (0.47-0.68)
Mastectomy	0.64 (0.61-0.67)	0.64 (0.61-0.67)	0.72 (0.62-0.84)	0.72 (0.62-0.84)

Models 1/3 adjusted for demographic, tumor and treatment factors.
Models 2/4 adjusted for socioeconomic factors in addition to above.

Table 3. Hazard ratio of mortality by race/ethnicity

Race/ethnicity	Hazard ratio (95% confidence interval) of mortality*			
	All-cause mortality		Breast cancer-specific mortality	
	Model-1	Model-2	Model-3	Model-4
Caucasians	1.00	1.00	1.00	1.00
African-Americans	1.09 (1.02-1.17)	1.02 (0.84-1.10)	1.27 (1.06-1.51)	1.21 (1.01-1.46)
Others	0.84 (0.77-0.91)	0.81 (0.75-0.88)	0.90 (0.72-1.12)	0.89 (0.70-1.11)

Models-1/3 adjusted for demographic variables and tumor factors; Models-2/4 additionally adjusted for treatment and SES

Conclusions and Public Health Implications

- Racial disparity in overall survival with breast cancer between Caucasians and African-Americans was largely explained by differences in treatment and SES.

- Definitive treatment (BCS + radiotherapy or mastectomy) was associated with lower mortality.

- Lower SES appeared to be a major barrier to achieving comparable outcomes for women with cancer.

- Racial differences still existed in breast cancer-specific mortality.

- Important public health implications if we are to achieve the goals of Healthy People 2010
  - minimize disparities in health care and SES
  - modifiable

6

Strengths

- **Large population-based cohort study**
  - covering >98% incident cancers
  - pathology confirmed by SEER registries

- **Reliable information on:**
  - cancer stage and grade
  - primary therapy (surgery and radiation)
  - long-term follow-up on vital status

- **Linked with Medicare claims**
  - important data on comorbidity – a strong confounder of survival
  - adjuvant chemotherapy data

- **Several measures of SES → consistent findings**

Limitations

- **SES at group level may be imperfect proxy for individual SES**
  - ecological fallacy
  - studies shown individual and community level SES in good agreement

- **Lack of information on:**
  - providers (physicians and hospitals)
  - patient/physician preference on choice of therapy
  - screening practices

- **No data on hormonal therapy (e.g. tamoxifen etc.)**

- **Generalizability to younger women and other regions/countries?**

Questions/Comments

Thanks for your attention!