

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

Xianglin L. Du, M.D., Ph.D.

Shenyng Fang, Ph.D. Candidate

Tamra E. Meyer, MPH, Ph.D. Candidate

University of Texas School of Public Health at Houston

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-III A 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-III A
 - 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
1 st (high)	1.0	1.0	1.0	1.0
2 nd	1.00 (0.95-1.06)	1.01 (0.96-1.06)	0.87 (0.75-1.00)	0.86 (0.75-1.00)
3 rd	1.06 (1.01-1.12)	1.07 (1.01-1.13)	1.01 (0.88-1.17)	1.00 (0.87-1.16)
4 th (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

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!