

Alicia Padron¹, Tulay Koru-Sengul^{1,3}, Stacey L. Tannenbaum³, Feng Miao³, Damien Hansra³, David Lee¹, Margaret M. Byrne^{1,2,3}
¹Departments of Public Health Sciences, and ²Surgery, ³Sylvester Comprehensive Cancer Center, University of Miami Miller School of Medicine, Miami, Florida

INTRODUCTION

- Breast cancer is the second leading cause of cancer death in U.S. women.
 - In 2013, an estimated 232,340 women will be diagnosed and 39,620 will die from breast cancer.
- There is no conclusive evidence of causality, but smoking may be associated with mortality in breast cancer patients.
 - This association may differ by race, ethnicity, and socioeconomic status (SES).
- With enhancement of the Florida Cancer Data System (FCDS) Registry, disparities in survival of cancer patients can be examined.

PURPOSE

- The purpose of this study was to examine the association between smoking and mortality in breast cancer patients, and determine if this differs by race, ethnicity, and SES using an enhanced dataset of FCDS linked with the Florida Agency for Health Care Administration (ACHA)

METHODS

- Data from 1996-2007 FCDS was enhanced by linkage with AHCA and information from the US Census.
- AHCA contains diagnosis and procedure codes for all in- and out-patient encounters at hospitals & free standing surgical & radiological treatment centers.
- Outcome of interest: survival time from date of diagnosis to date of death.
- Inclusion criteria: Females ≥18 years old, diagnosed with breast cancer in the state of Florida.
- Smoking status was assessed by self report in FCDS.
- Final sample size, N=127,754.
- Statistical analyses:
 - Univariate and multivariate Cox proportional hazard regression model.
 - Multivariate models were conducted sequentially with progressive adjustments for:
 - Sociodemographic variables
 - Clinical-pathological variables
 - Comorbidities.

Demographic Characteristics

	All patients	Smoking status			
		N	% in each category		
All patients	127,754	62,361	23,365	15,793	26,235
Race					
White	115,506	48	19	13	21
Black	10,820	59	11	10	20
Native American	60	52	12	18	18
Asian	656	70	6	5	18
Pacific Islander	50	64	18	2	16
Asian Ind/Pakistani	212	66	7	2	25
Other	450	53	9	5	33
Hispanic origin					
No	115,514	47	19	13	21
Yes	12,240	64	10	8	18
SES					
Lowest	14,381	53	14	13	20
Middle-low	37,382	49	17	14	21
Middle-high	48,356	47	19	12	21
Highest	27,635	49	21	11	20

Cox Proportional Hazards Models by Smoking Status

Smoking Status	Univariate		Multivariate	
	HR (95%CI)	P-value	HR (95%CI)	P-value
Never	1 (reference)		1 (reference)	
Former	1.04 (1.01, 1.08)	0.009	1.08 (1.04,1.12)	<0.001
Current	1.15 (1.11, 1.19)	<0.001	1.31 (1.26, 1.37)	<0.001
Unknown	1.37 (0.96, 1.96)	0.082	1.04 (0.97, 1.11)	0.255

Multivariate model includes additional demographic/clinical predictors and comorbidities

Multivariate Cox Proportional Hazards Model by Race/Ethnicity/SES Subgroups

	Former*		Current*		Unknown*	
	HR (95%CI)	P-value	HR (95%CI)	P-value	HR (95%CI)	P-value
Race						
White	1.08 (1.05, 1.12)	<0.001	1.39 (1.32, 1.46)	<0.001	1.07 (1.02, 1.12)	0.010
Black	1.03 (0.92, 1.15)	0.636	1.10 (0.99, 1.23)	0.089	0.99 (0.90, 1.08)	0.808
Other	1.06 (0.72, 1.54)	0.781	1.70 (1.02, 2.82)	0.040	1.04 (0.71, 1.51)	0.846
Hispanic						
No	1.08 (1.05, 1.12)	<0.001	1.36 (1.30, 1.43)	<0.001	1.05 (1.00, 1.10)	0.051
Yes	0.94 (0.81, 1.09)	0.416	1.05 (0.91, 1.20)	0.514	1.11 (1.00, 1.24)	0.045
SES						
Lowest	1.04 (0.94, 1.15)	0.412	1.22 (1.11, 1.34)	<0.001	1.11 (1.02, 1.20)	0.013
Middle-low	1.09 (1.04, 1.15)	<0.001	1.32 (1.23, 1.42)	<0.001	1.05 (0.97, 1.13)	0.197
Middle-high	1.09 (1.04, 1.15)	<0.001	1.41 (1.33, 1.51)	<0.001	1.04 (0.97, 1.12)	0.222
Highest	1.02 (0.96, 1.09)	0.532	1.33 (1.20, 1.48)	<0.001	1.05 (0.98, 1.14)	0.181

*Never Smokers are used as a reference in comparibon to former, current, and unknown status. Model includes additional demographic, clinical predictors and comorbidities. Each row represents a separate model

RESULTS

- The majority of the sample were White (90.4%), non-Hispanic (90.4%), and in the middle-high or highest SES category (59.5%).
- In the unadjusted model compared with never smokers, worse survival was found in:
 - Current smokers HR 1.15 (P<0.001)
 - Former smokers HR 1.04 (P=0.009)
- In the model adjusting for extensive demographic, clinical characteristics and comorbidities, worse survival was found in:
 - Current smokers HR 1.31 (P<0.001)
 - Former smokers HR 1.08 (P<0.001)
- In multivariate analyses on racial, ethnic, and SES subgroups of the population, compared with never smokers, we found:

RACE

- Worse survival for Whites with current (HR 1.39; P<0.001), former (HR 1.08; P<0.001), or unknown (HR 1.07; P=0.01) smoking status.
- No different in survival for Blacks based on smoking history.

ETHNICITY

- Worse survival was seen for non-Hispanics who were current (HR 1.36; P<0.001) or former (HR 1.08; P<0.001) smokers.

SES

- Worse survival was observed for current smokers across all SES categories (P<0.001 for all) and for former smokers in the middle 2 SES categories (P<0.001).

CONCLUSION

- Using an enhanced FCDS registry for female breast cancer patients provided a strengthened ability to identify an association of smoking status with survival as well as its differing associations by race, ethnicity, and SES, therefore:
 - Further use of a enhanced FCDS registry is needed to explore cancer disparities.
 - Further exploration is needed to clarify the survival disparities.

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