



Secondary Breast Cancer Sociodemographic Characteristics and Survival by Age Group

Candice A.M. Sauder, MD, MEd,^{1,2} Qian Li, MS,³ Fredrick J. Meyers, MD,^{1,4} Richard J. Bold, MD,^{1,2} Theresa H. M. Keegan, PhD, MS,^{1,3,4}

¹Comprehensive Cancer Center, University of California Davis, Sacramento, CA

²Division of Surgical Oncology, Department of Surgery, University of California Davis School of Medicine, Sacramento, CA

³Center for Oncology Hematology Outcomes Research and Training (COHORT), University of California Davis School of Medicine, Sacramento, CA

⁴Division of Hematology & Oncology, Department of Internal Medicine, University of California Davis School of Medicine, Sacramento, CA

Poster Number: 788029

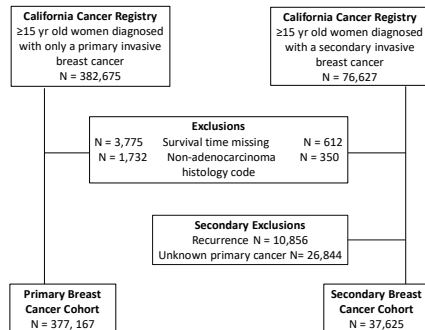
Introduction

- In the United States, 16% of new cancers are secondary cancers; for females, this is most commonly breast cancer (BC)
- Among adolescent and young adults (AYA; 15-39 years old), secondary BCs have distinct characteristics and decreased survival compared with primary BC
- Little is known about secondary BC in middle-age (40-64 years old) and elderly (≥65 years old) populations
- Therefore, we utilized population-based California Cancer Registry (CCR) data to determine characteristics and breast cancer specific survival (BCSS) of secondary BC for each of these age groups

Methods

- Analyses focused on female patients aged ≥ 15 years at diagnosis for invasive BC during 1991-2015 (**Figure 1**).
- Multivariable logistic regression was used to compare demographic and clinical characteristics secondary (vs primary) BC by age (15-39 years, 40-64 years, ≥65 years)
- Multivariable Cox proportional hazards regression models were used to evaluate BCSS of secondary (vs primary) BC in each age group

Figure 1. Selection of Primary and Secondary BCs in California (1991-2015)



Patient Characteristics

Table 1: Characteristics and Treatment of Patients with Primary and Secondary Breast Cancer by Age, California Cancer Registry (1991-2015)

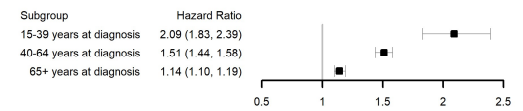
Characteristics	15-39 years at diagnosis		40-64 years at diagnosis		65+ years at diagnosis	
	Only primary N = 23,298 N (%)	Secondary N = 777 N (%)	Only primary N = 205,101 N (%)	Secondary N = 15,848 N (%)	Only primary N = 148,768 N (%)	Secondary N = 21,000 N (%)
Race/ethnicity						
Non-Hispanic White	10,809 (46.4)	368 (47.4)	125,351 (61.1)	10,084 (63.6)	111,868 (75.2)	16,358 (77.9)
Non-Hispanic Black	1,939 (8.3)	79 (10.2)	13,663 (6.7)	1,284 (8.1)	7,634 (5.1)	1,190 (5.7)
Hispanic	6,689 (28.7)	227 (29.2)	37,599 (18.3)	2,599 (16.4)	16,424 (11.0)	1,954 (9.3)
Asian/Pacific Islander	3,581 (15.4)	101 (13.0)	25,830 (12.6)	1,813 (11.4)	10,879 (7.3)	1,403 (6.7)
Tumor grade						
Grade I	1,578 (6.8)	55 (7.1)	37,070 (18.1)	3,004 (19.0)	32,392 (21.8)	5,231 (24.9)
Grade II	6,829 (29.3)	223 (28.7)	76,486 (37.3)	6,033 (38.1)	57,265 (38.5)	8,883 (42.3)
Grade III	11,965 (51.4)	386 (49.7)	68,162 (33.2)	5,069 (32.0)	34,861 (23.4)	4,666 (22.2)
Histology						
Ductal	18,834 (80.8)	588 (75.7)	153,595 (74.9)	11,400 (71.9)	101,225 (68.0)	14,195 (67.6)
Lobular	2,182 (9.4)	96 (12.4)	34,692 (16.9)	3,048 (19.2)	28,553 (19.2)	4,803 (22.9)
Tumor Size						
T1a: ≤ 0.5cm	878 (3.8)	68 (8.8)	14,215 (6.9)	1,725 (10.9)	9,379 (6.3)	2,008 (9.6)
T1b: > 0.5-1cm	1,631 (7.0)	92 (11.8)	29,892 (14.6)	2,973 (18.8)	26,471 (17.8)	4,364 (20.8)
T1c: > 1-2cm	6,486 (27.8)	241 (31.0)	69,174 (33.7)	5,232 (33.0)	50,791 (34.1)	7,357 (35.0)
T2: > 2-5cm	9,638 (41.4)	210 (27.0)	63,719 (31.1)	3,804 (24.0)	40,722 (27.4)	4,985 (23.7)
T3: > 5.00 cm	2,737 (11.7)	69 (8.9)	14,461 (7.1)	835 (5.3)	8,387 (5.6)	909 (4.3)
Lymph node involvement						
Positive	11,491 (49.3)	294 (37.8)	75,584 (36.9)	4,451 (28.1)	37,595 (25.3)	4,343 (20.7)
Chemotherapy						
Yes	17,183 (73.8)	454 (58.4)	102,042 (49.8)	6,505 (41.0)	24,360 (16.4)	3,127 (14.9)
Radiation						
Yes	10,213 (43.8)	233 (30.0)	98,386 (48.0)	5,216 (32.9)	57,478 (38.6)	6,662 (31.7)
Surgery						
Lumpectomy	8,538 (36.6)	230 (29.6)	105,056 (51.2)	6,129 (38.7)	76,163 (51.2)	10,204 (48.6)
Mastectomy	12,786 (54.9)	456 (58.7)	85,862 (41.9)	8,286 (52.3)	56,454 (37.9)	8,900 (42.4)
Sentinel Lymph Node Biopsy	6,449 (27.7)	215 (27.7)	78,398 (38.2)	6,770 (42.7)	51,236 (34.4)	9,009 (42.9)
Axillary Lymph Node Dissection	14,299 (61.4)	375 (48.3)	106,850 (52.1)	6,071 (38.3)	63,543 (42.7)	6,559 (31.2)
Estrogen Receptor status						
Positive	12,989 (55.8)	366 (47.1)	140,906 (68.7)	10,720 (67.6)	103,416 (69.5)	15,772 (75.1)
Progesterone Receptor status						
Positive	11,454 (49.2)	330 (42.5)	119,812 (58.4)	8,592 (54.2)	84,423 (56.7)	12,675 (60.4)
HER-2 status*						
Positive	3,366 (26.5)	104 (23.2)	24,523 (19.6)	2,069 (17.4)	10,983 (13.5)	2,014 (12.6)

*HER-2 data is limited to 2003+ diagnoses

Results

- Secondary BC was more common at older ages (15-39 years, n=777; 40-64 years, n=15,848; ≥65 years, n=21,000)
- Secondary BC patients were less likely to be Black, Hispanic or Asian/Pacific Islander as they aged than women with a primary BC (**Table 1**)
- As the secondary BC patients aged, the tumors were more likely to be lower grade, lobular histology, smaller in size, and lymph node negative (**Table 1**)
- Secondary BC patients of all ages were less likely to get chemotherapy or radiation, but more likely get a mastectomy (**Table 1**)
- In multivariable logistic regression models, secondary BC was somewhat more likely among Black (vs non-Hispanic white) AYA patients (odds ratio (OR): 1.25; 95% confidence interval (CI) 0.97-1.61)
- Secondary BC was less likely middle-aged (OR: 0.80; CI 0.76-0.84) and older (OR: 0.72; CI 0.68-0.75) Hispanics and Asian/Pacific Islanders of all ages
- Secondary BCs were more likely to have higher grade, lobular histology, be smaller in size, be lymph node negative and be ER/PR negative than primary BCs across all ages in multivariable models.
- All secondary BC patients showed decreased BCSS compared with primary BC patients, but the impact on survival diminished with age even when considering other causes of death as a competing risk (**Figure 2**)

Figure 2: Secondary Breast Cancer Specific Survival among Patients with Invasive BC



Conclusions

- We found that BCSS is significantly decreased among all women diagnosed with secondary (vs primary) BC even with adjustments for tumor characteristics, with the strongest impact on survival seen in the 15-39 age group
- Women diagnosed with primary BC are known to have decreased BCSS within this age group as well, which appears only multiplied by the secondary nature of the tumor

Please contact Candice Sauder at camsauder@ucdavis.edu with questions.