Identifying Smoking-Related Factors in Breast Cancer Patients

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BACKGROUND

Smoking is a known risk factor for numerous cancers that negatively impacts long-term survival in breast cancer (BC) survivors.

We aimed to characterize factors associated with current smoking behaviors among patients with newly diagnosed breast cancer (BC), assessing the following:

- Demographics (e.g., education, marital status, race)
- Socioeconomic factors (e.g., financial stability/difficulty)
- Habits (e.g., alcohol consumption, exercise)
- Clinical factors (e.g., tumor stage, cancer treatments, comorbidities)
- Survey factors (e.g., time between diagnosis and survey return)

METHODS

This Mayo Clinic Breast Disease Registry is a prospective longitudinal cohort study that enrolls patients diagnosed with BC within the past year.

3,729 participants who were diagnosed 2014-2024 and completed a baseline (enrollment) questionnaire with smoking information were included.

Smoking status was categorized as current, former, or never based on these questionnaire data.

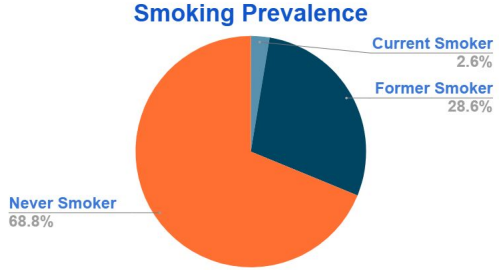
Univariable analysis (t-tests and chi-square tests) assessed associations with current smoking (compared to never/former smoking) for the following variables:

- Time since diagnosis
- Age at diagnosis
- Exercise
- Alcohol use
- Difficulty paying bills
- Education
- Race, marital status
- Tumor stage
- Treatment received (chemo, surgery, radiation, endocrine therapy)
- Medical history of hypertension,hyperlipidemia, cardiac disease, stroke, diabetes, history of lung, kidney, liver,thyroid disease and endometriosis

Variables with p<0.05 were included in a multivariable logistic regression model

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RESULTS



Population Demographics:

- Mean age at diagnosis: 58.3 years (SD 12.9)
- 99.1% were female, 97.1% White, 98.7% non-Hispanic.
- 81.7% were married or living as married
- 56.4% had a bachelor's degree or higher
- 2.7% reported difficulty paying bills
- 21.7% consumed ≥5 alcoholic drinks/week

Clinical Factors:

Tumor stage distribution: Stage 0 (13.9%), Stage 1 (43.9%), Stage 2 (28.9%), Stage 3 (8.9%), and Stage 4 (4.5%);

Treatments Received: 33.8% received chemotherapy, 56.5% radiotherapy, 63.6% endocrine therapy, and 42.2% underwent mastectomy.

Characteristics	Current Smokers	Never/Former Smokers	Univariable Association	Adjusted p-value after Multivaribable association
Alcohol ≥5/Week	32.60%	21.50%	p=0.012	0.005
Difficulty Paying Bills	9.60%	2.50%	p<0.001	0.005
< Bachelor's Degree	69.50%	42.90%	p<0.001	<0.001
Later Return of Survey (270-365 days after diagnosis)	10.50%	4.20%	p=0.022	0.041

Table 1: Association of demographics and clinical characteristic with current smoking

SMOKING CHARACTERISTICS			
Characteristics	Never or Former Smokers (N=3634)	Current Smokers (N=95)	P [1]
Age Started Smoking			0.013
N	1042[2]	87	
Mean (SD)	18.6[4.4][2]	19.9 [6.2]	
Median (Range)	18[4, 58][2]	18[12, 45]	
Average Cigarettes Per Day			0.388
N	1035[2]	94	
Mean (SD)	13.4[9.6][2]	12.5[7.9]	
Median (Range)	10[1, 60][2]	10[1, 60]	
Years Smoked			<0.001
N	955[2]	87	
Mean (SD)	20.0(12.9)[2]	32.8[14.1]	
Median (Range)	17.5[0.5, 56.5][2]	34.9[1.1, 60.3]	
Pack-Years Cigarettes Smoked			<0.001
N	938[2]	87	
Mean (SD)	15.4[16.8][2]	22.3[17.2]	
Median (Range)	10.1[0.1, 123.8][2]	18.8[0.2, 88.4]	

1. Two-sample t-test
2. Values subset to former smokers

Table 2: Smoking characteristics by current smoking status

CONCLUSIONS

Current smoking soon after a breast cancer (BC) diagnosis is not common (2.6%) but is independently associated with a distinct socioeconomic and behavioral profile.

These findings confirm that patients with BC who currently smoke face significant socio demographic challenges (lower education, financial difficulty) and co-occurring risk behaviors (higher alcohol consumption).

Clinical Implications: Routine assessment of smoking status at diagnosis is critical. Tailored, integrated interventions focused on smoking cessation should address these associated socioeconomic and behavioral factors to improve health outcomes and long-term survival for BC survivors.