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Brain Metastases in Newly Diagnosed Patients with Lung Cancer: A Population-Based Study of Incidence and Survival from 2010-2014

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Introduction

Metastatic brain cancer (MBC) is the most common intracranial tumor in adults. It is ten times more common than any type of primary brain tumor. The most common origin of brain metastasis is lung cancer. The aim of this study is to determine the incidence and survival of patients with brain metastases at diagnosis of primary lung cancer and any covariates associated with increased incidence or decreased survival.

Methods

Data Acquisition: Using the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database4 from 18 population-based central cancer registries from the US population, patients with brain metastasis at the time of lung cancer diagnosis from 2010-2014 were identified. ICD-O-3 codes used were: lung/bronchus and stratified by age, gender, lung cancer subtype, and race/origin, marital status, insurance.

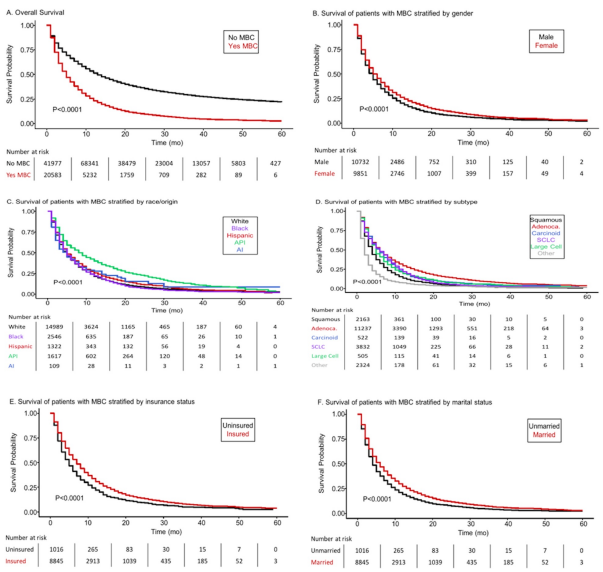
Software: Surveillance Research Program, National Cancer Institute SEER*Stat software (www.seer.cancer.gov/seerstat) version 8.3.5.

Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research

Results

Among the 162,560 patients diagnosed with lung cancer, there were 20,583 patients with MBC (median survival time of 5 months) and 141,977 patients without MBC (who had a median survival of 13 months, P=0.0001). The presence of MBC predicts a worse survival regardless of gender, race/origin, marital status, insurance status, and lung cancer subtype (P<0.05). Asian race, small cell lung cancer, large cell carcinoma, and adenocarcinoma were independently associated with

Survival of Patients with MBC



(A) Overall Survival. (B-F) Patients with MBC stratified by gender, race/origin, subtype, insurance status, marital status, respectively. MBC, metastatic brain cancer; Mo, months; SCLC, small cell lung cancer; Adenoca, adenocarcinoma; AI, American Indian; API, Asian pacific islander.

Conclusions

MBC in newly diagnosed lung cancer is associated with poorer survival. We identified factors significantly associated with the presence and survival of MBC at diagnosis of lung cancer. Integrating these epidemiological patterns can aid therapeutic decision making for MBC patients.

References

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Factors associated with all-cause five-year mortality of lung cancer patients with and without MBC

Variable	Multi-variable Hazard Ratio of All-Cause 5-Year Mortality		
	All Lung Cancer Pt HR (CI)	Pt with BM HR (CI)	Pt without BM HR (CI)
Overall			
No Brain Met	—		
Yes Brain Met	2.17 (2.11-2.23) *		
Gender			
Male	—	—	—
Female	0.72 (0.71-0.74) *	0.83 (0.80-0.87) *	0.69 (0.67-0.71) *
Race/Origin			
White	—	—	—
Black	1.06 (1.03-1.10) *	1.01 (0.95-1.08)	1.08 (1.04-1.11) *
Hispanic	1.01 (0.96-1.06)	0.92 (0.84-1.02)	1.05 (0.99-1.10)
Asian Pacific Islander	0.79 (0.75-0.83) *	0.68 (0.62-0.75) *	0.82 (0.78-0.87) *
American Indian	0.25 (0.23-0.28) *	0.74 (0.53-1.03)	0.25 (0.23-0.28) *
Marital Status			
Unmarried	—	—	—
Married	0.80 (0.78-0.82) *	0.80 (0.76-0.84) *	0.80 (0.78-0.82) *
Insurance Status			
Uninsured	—	—	—
Insured	0.76 (0.73-0.79) *	0.82 (0.76-0.88) *	0.74 (0.71-0.77) *
Subtype			
Squamous	—	—	—
SCLC	1.40 (1.36-1.45) *	0.79 (0.72-0.86) *	1.60 (1.54-1.66) *
Large Cell	1.04 (0.97-1.12)	0.80 (0.69-0.93) *	1.07 (0.98-1.16)
Adenocarcinoma	0.87 (0.85-0.90) *	0.67 (0.62-0.72) *	0.89 (0.86-0.92) *
Carcinoid	0.46 (0.43-0.50) *	0.77 (0.66-0.90) *	0.40 (0.37-0.44) *
Other	1.65 (1.57-1.73) *	1.42 (1.28-1.58) *	1.64 (1.55-1.73) *

Learning Objectives

By the conclusion fo this session, participants should be able to 1) Describe the importance of a population-based study in the incidence and survival of brain metastases, 2) Discuss certain demographics that have significantly different incidence and survival and 3) Identify potential future studies to evaluate and address health care disparities among patients with brain metastases at diagnosis of primary lung cancer.