

Racial Disparity in Pancreatic Resection Among Elderly Patients: A SEER Database Analysis

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Background

- Pancreatic cancer (PC) is the fourth leading cause of cancer death in the US, with an estimated 57,600 incident cases and 47,050 deaths in 2020¹
- Five-year survival rate is 9% for all stages combined due to advanced stage at diagnosis and lack of effective treatment options¹
 - Patients who undergo surgical resection have a 5-year survival rate of 18-24%²
 - Less than 20% of patients are candidates for surgery due to advanced stage at diagnosis¹
- In elderly patients, the decision to receive surgery is complicated by patient’s comorbidities, functional status, and frailty
- Racial disparities in pancreatic resection are well documented in the literature, but little is known about whether racial disparities exist in elderly patients³

Objectives

- To examine the relationship between race/ethnicity and surgical resection among elderly locoregional pancreatic cancer patients

Methods

Data Source

- The National Cancer Institute’s Surveillance, Epidemiology, and End Results (SEER) database from 2007 to 2016 was used
- SEER includes 18 registries representing 28% of the United States population

Study Population

- **Inclusion:** age ≥ 65; exocrine pancreatic cancer located in the head, body, or tail of the pancreas; primary malignant cases; local or regional disease (AJCC, 6th Ed. 1-2B)
- **Exclusion:** identified by death certificate or autopsy; missing key demographic or clinical information

Study Variables

- **Race/ethnicity:** white, black, Hispanic, other (American Indian, Asian/Pacific Islander)
- **Patient characteristics:** demographic (age, sex), social (marital status, region, year of diagnosis), clinical (stage, tumor location, tumor size)
- **Surgical resection:** surgical procedure that removes and/or destroys tissue of the primary site performed as part of the initial work-up or first course of therapy

Statistical Analysis

- Descriptive statistics were performed on baseline patient characteristics of the overall sample
 - Chi-square tests were used to compare race/ethnicity by patient characteristics
- Multiple logistic regression adjusting for patient characteristics was used to assess the association of race/ethnicity with odds of receiving resection
- All analyses performed using Statistical Analysis System (SAS) 9.4 Software

Table 1: Demographics of Study Population (N=12,829)

	White (N=9,372)	Black (N=1,162)	Hispanic (N=1,198)	Other (N=1,097)	P-value
Characteristics	%	%	%	%	
Age					0.001
65 - 74	45.7	52.6	48.8	45.1	
75 - 85	38.7	34.2	38.2	39.3	
85+	15.6	13.3	13.0	15.6	
Sex					<.0001
Male	48.0	36.5	42.8	43.4	
Female	52.0	63.5	57.2	56.6	
Year of Diagnosis					0.099
2007 - 2011	45.0	44.3	41.6	42.9	
2012 - 2016	55.0	55.7	58.4	57.0	
Marital Status					<.0001
Married	57.7	38.0	54.8	63.1	
Unmarried	42.3	62.0	45.2	36.9	
Region					<.0001
West	47.4	26.3	82.4	88.9	
North Central	11.5	12.2	1.8	1.2	
South	23.7	45.8	3.8	3.0	
Northeast	17.4	15.7	12.1	6.9	
Initial Stage					0.021
Stage 1	27.6	31.7	27.5	26.6	
Stage 2	72.5	68.3	72.5	73.4	
Tumor Location					0.480
Head	81.9	79.9	82.1	81.1	
Body	9.7	11.7	9.5	10.6	
Tail	8.5	8.4	8.4	8.3	
Tumor Size					0.054
< 20mm	10.2	7.9	9.3	8.5	
< 30mm	27.3	26.0	28.9	31.2	
< 40mm	30.6	31.8	29.7	30.7	
< 50mm	17.5	19.3	18.0	15.9	
≥ 50mm	14.3	15.1	14.2	13.8	
Resection					<.0001
No	54.0	63.3	57.9	55.2	
Yes	46.0	36.7	42.1	44.8	

Results

Study population [Table 1]

- A total of 12,829 patients met inclusion and exclusion criteria, of whom 7,098 (55.3%) did not receive surgery
- The mean age of patients was 76, with the majority being female (54.0%), white (73.1%), and with pancreatic cancer located in the head of the pancreas (81.6%)

Figure 1: Odds of Receiving Surgical Resection by Race/ethnicity

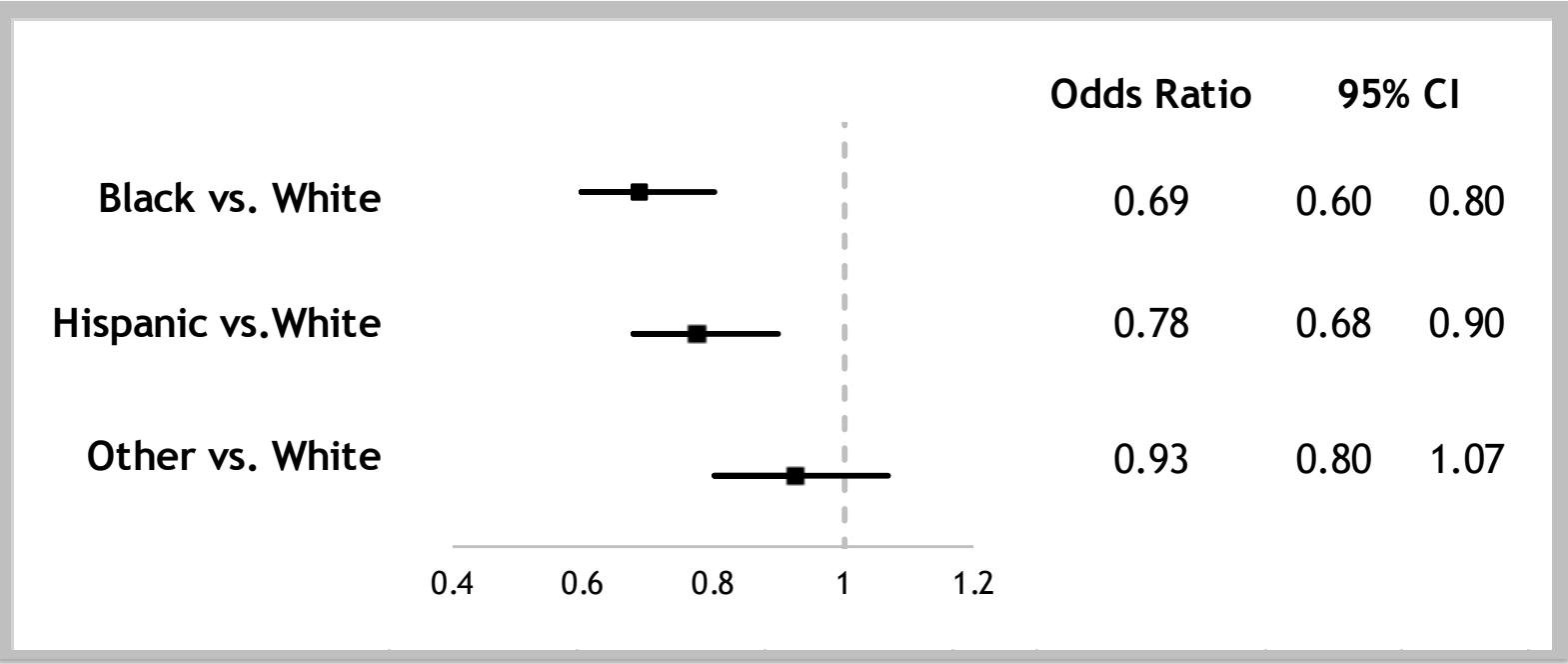


Table 2: Multivariate Analysis Odds Ratio of Receiving Surgical Resection

	Odds Ratio (95% CI)
Race/ethnicity	
White	Reference
Black	0.69 (0.60-0.80)
Hispanic	0.78 (0.68-0.90)
Other	0.93 (0.80-1.07)
Age	
65 - 74	Reference
75 - 85	0.51 (0.47-0.55)
85+	0.09 (0.08-0.11)
Marital Status	
Married	Reference
Unmarried	0.73 (0.68-0.80)
Region	
West	Reference
North Central	0.95 (0.83-1.09)
South	0.88 (0.79-0.97)
Northeast	1.46 (1.30-1.63)
Tumor Location	
Head	Reference
Body	1.01 (0.89-1.16)
Tail	4.48 (3.83-5.23)
Tumor Size	
< 20mm	2.38 (2.05-2.76)
< 30mm	1.32 (1.20-1.47)
< 40mm	Reference
< 50mm	0.81 (0.72-0.91)
≥ 50mm	0.72 (0.63-0.82)
Initial Stage	
Stage 1	0.28 (0.26-0.31)
Stage 2	Reference

Multivariable Logistic Regression [Figure 1, Table 2]

- A total of 7,098 (55.3%) patients did not receive surgery
- The odds of receiving surgical resection were 31% lower among black patients and 22% lower in Hispanic patients compared to white patients
- Patients aged 75-85 were 49% less likely to receive surgical resection compared to patients aged 65-74
- Patients with tumor at the tail of the pancreas were 4.5 times more likely to receive surgical resection compared to those with the tumor at the head of the pancreas

Limitations

- Socioeconomic status, comorbidities, pathology, intraoperative parameters, and patient history data were unavailable in the SEER database
- Only 28% of the US population is represented in the SEER database and our population was mostly Caucasian

Conclusions

- Among elderly pancreatic cancer patients, Black and Hispanic patients are less likely to receive surgical resection than white patients, despite being eligible for surgery
- Racial disparities in surgical resection seen among younger patients (age < 65) continue in the elderly populations
- Further studies are needed to understand the mechanism of the disparities and to identify the mediators within racial/ethnic groups that can be targeted for intervention

References

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3. Murphy M, , Simons J, Hill J, et al. Pancreatic cancer: a key component to reducing racial disparities in pancreatic adenocarcinoma. Cancer (2009); 115(17):3979-3990.