

Racial Differences in Vestibular Schwannoma

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Background

Owing to improved screening protocols for asymmetrical hearing loss, greater access to advanced imaging, and improved resolution afforded by fine-cut gadolinium-enhanced magnetic resonance imaging, the incidence of VS has increased and the average tumor size at the time of diagnosis has decreased.^{1,2} Although microsurgical resection has been the preferred therapy for VS, stereotactic radiosurgery, and conservative management with serial imaging have become viable alternatives for patients with small- to medium-sized VS.³ In recent years, race, ethnicity, and socioeconomic-related differences in medical care have received increasing attention. The influence of these factors on health care access, delivery, and outcomes are pervasive and far-reaching.

To date, the majority of the VS literature has reported on total population data, with few published reports regarding racial differences in disease epidemiology and management. In 2011, McClelland et al. analyzed the Nationwide Inpatient Sample hospital discharge database and determined that African American race was independently predictive of a nine-fold increased risk of postoperative mortality following resection of VS compared to Caucasians.⁴ Additionally, in 2013, Babu et al. reviewed 6,225 patients with VS treated from 2004 to 2009 using the SEER database and found that African American patients were less likely to undergo microsurgical resection compared to Caucasians, despite having larger tumors.⁵

Methods

Analysis of the Surveillance, Epidemiology, and End Results (SEER) database was performed, including all patients identified with a diagnosis of VS. Associations between race, disease presentation, treatment strategy, and overall survival were analyzed in a univariate and multivariable model.

Results

- Total of 9,782 patients with VS were identified among 822 million person-years.
- Of these, 7,400 (75.6%) claimed white, 807 (8.2%) Hispanic, 755 (7.7%) Asian, 397 (4.1%) black, and 423 (4.3%) patients reported other race.
- Median annual incidence of disease was lowest among black (0.43 per 100,000 persons) and Hispanic populations (0.45 per 100,000 persons) and highest among white (1.61 per 100,000 persons) populations (P < 0.001).
- Hispanic patients were diagnosed at the youngest age, and white patients were diagnosed at the oldest age (mean of 50.0 vs. 56.0 years, respectively; P < 0.001).
- Compared to white populations, black, Hispanic, and Asian populations were more likely to present with larger tumors (P < 0.001).
- White patients were most likely to undergo gross total tumor resection, whereas the Hispanic population was most likely to undergo subtotal removal (P = 0.002)
- After controlling for tumor size, age, and treatment center in a multivariable model, Hispanic patients were more likely than white patients to undergo surgery (P = 0.010); however, there were no differences between white, black, and Asian populations with regard to treatment modality.

Results

Year	Overall	White	Black	Hispanic	Asian/Pacific Islander	Other
2004	1.189	1.564	0.425	0.446	1.035	1.563
2005	1.102	1.463	0.440	0.348	1.071	1.138
2006	1.234	1.607	0.431	0.541	1.221	1.442
2007	1.218	1.609	0.267	0.461	1.203	1.332
2008	1.211	1.641	0.518	0.423	0.976	0.917
2009	1.271	1.719	0.502	0.455	0.977	1.217
2010	1.156	1.557	0.411	0.477	0.931	1.414
2011	1.099	1.475	0.397	0.404	1.047	1.203
2012	1.219	1.659	0.478	0.428	1.189	1.591
Median	1.211	1.607	0.431	0.446	1.047	1.332
P value vs. white			<0.0001	<0.0001	<0.0001	0.002

Results

TABLE 2
Probability of Receiving Primary Surgery Between Racial Groups, After Controlling for Age, Tumor Size, and Treatment Center.

Variable	Odds Ratio	Lower CI	Upper CI	P Value
Asian vs. white	1.048	0.895	1.227	0.5615
Black vs. white	0.876	0.710	1.081	0.2176
Hispanic vs. white	1.224	1.049	1.429	0.0102
Other vs white	0.647	0.530	0.790	<0.0001

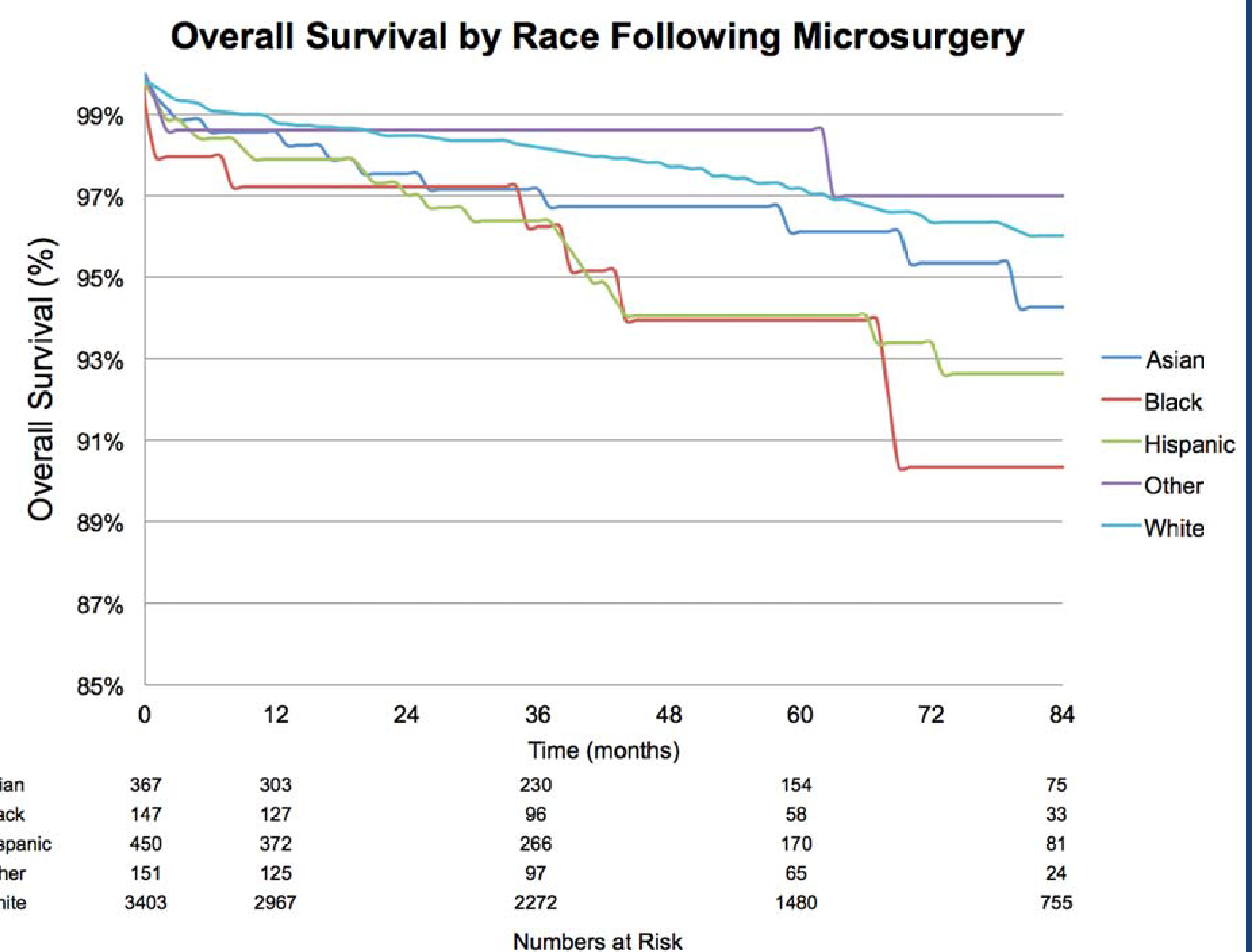


Figure 1. Kaplan-Meier analysis comparing overall survival between racial groups that underwent vestibular schwannoma microsurgical resection.

Conclusions

Numerous variables such as race, economic resources, educational background, and cultural framework all have the potential to impact the diagnosis and treatment of both benign and malignant diseases. As demonstrated in this analysis, racial differences exist in relation to VS incidence, disease presentation, treatment selection and outcome. Further research analyzing the impact of sociodemographic factors on disease may ultimately help direct efforts to reduce differences in health care access and improve care for all patients with VS.

References

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