Age and Surgical Treatment Predict Survival in Central Neurocytoma

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Introduction

Primary central neurocytoma are rare tumors that account for one-half of all intraventricular lesions in adults [1, 2]. The objective of this study was to characterize neurocytoma patients nationwide and to determine factors that impact survival.

Methods

- We queried the SEER 18 registry for cases of primary neurocytoma as coded by the International Classification of Disease for Oncology, Third Edition (ICD-O-3).
- Univariate analysis was performed using Student's t-test or Chi-squared tests as appropriate.
- Survival analysis was performed using Cox Proportional-Hazards regression and by comparing Kaplan-Meier curves with log-rank tests.

Table 1

	All	% or SD	Intraventricular	% or SD	Parenchymal	% or SD	p Sig
N	310		222	71.6%	88	28.4%	
Age at diagnosis, yr (n=310)	33.8	15.5	34.1	15.5	33.2	15.6	0.6
Female (n=310)	158	51.0%	111	50.0%	47	53.4%	0.6
Race (n=310)							0.1
White	236	76.1%	170	76.6%	66	71.0%	
Non-white*	74	23.9%	49	22.1%	22	23.7%	
Unknown	8	2.6%	3	1.4%	5	5.4%	
Tumor size, mm (n=220)	41.4	18.7	43.1	18.9	37.3	17.8	0.2
Overall mortality (n=310)	46	14.8%	36	16.2%	10	11.4%	0.3
30-day mortality (n=293)	27	8.7%	17	7.7%	10	11.4%	0.06 *
Survival from diagnosis, months (n=308)	52.2	39.3	57.3	39.6	41.3	37.7	0.003 ***
Procedure (n=310)							0.3
Surgery (e.g., Gross total, partial, or combined resection)	173	68.1%	127	69.8%	46	63.9%	
Photodynamic therapy	47	18.5%	29	15.9%	18	25.0%	
No surgery	31	12.2%	23	12.6%	8	11.1%	
Unknown	3	1.2%	3	1.6%	0	0.0%	

Demographics for neurocytoma patients by location (parenchymal or intraventricular). Race aggregated as White or Non-White due to low counts in specific categories. * P<0.10, ** P<0.05, *** P<0.0

Results

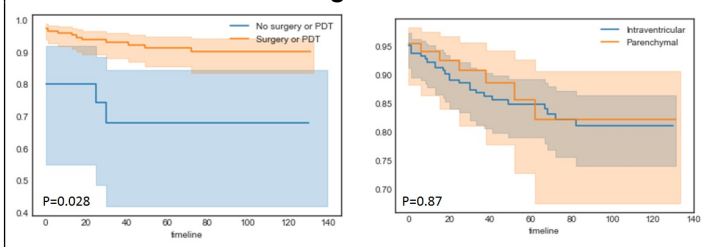
- A total of 310 cases of intraventricular or parenchymal neurocytoma were queried from the SEER 18 registry.
- Overall mortality was 14.8%, 30-day mortality was 8.7%, mean survival from diagnosis was 52.2 months, 71.6% were intraventricular neurocytoma.
- Unadjusted survival from diagnosis was significantly lower in parenchymal (39.3 months) versus intraventricular (41.3 months) neurocytoma (P=0.003) and the relative increase in 30-day mortality between parenchymal (11.4%) and intraventricular (8.7%) approached significance (P=0.064).
- Survival analysis, however, revealed no significant decrease in overall survival by location (P=0.71), but a significant difference in five-year survival was observed between patients who received surgery (92.95%) as a treatment and those who did not (70.00%) (P=0.0010).
- Age was a significant predictor of adjusted mortality (HR 1.05, 95% CI 1.02-1.08, P=0.0002) as was not receiving surgery (HR 11.88, 95% CI 1.31-107.7, P=0.028).

Table 2

Covariate	HR (95% CI)	p
Age at diagnosis	1.05 (1.02-1.08)	0.0002
Female	1.34 (0.54-3.33)	0.53
Race		
Nonwhite	2.15 (0.58-7.89)	0.25
Tumor size	1.02 (0.995-1.05)	0.1
Intraventricular	0.92 (0.31-2.71)	0.87
Treatment		
Surgery	4.49 (0.58-34.91)	0.15
PDT	1.38 (0.08-22.40)	0.82
None	11.88 (1.31-107.7)	0.028

Extimated hazard ratios of death from Cox Proportional-Hazards regression among neurocytoma patients

Figure 1



Kaplan-Meier survival estimates for (a) surgical treatment versus no surgical treatment, and (b) tumor location. P values drawn from adjusted Cox Proportional-Hazards model (see Table 2).

Conclusions

- Surgical treatment and age are significant prognostic factors contributing to survival in neurocytoma, while parenchymal location is not.
- Contrary to previous studies (see [3]), we did not find any significant difference in incidence of neurocytoma across gender or race.
- Our findings are undescribed in previous literature and may inform prognosis and treatment of patients with parenchymal neurocytoma. Further studies may focus on the comparative effectiveness of treatments.

References

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