TAKING SIDES: IMPORTANCE OF TUMOR LATERALITY IN UNDERSTANDING COGNITIVE TESTING IN PRIMARY BRAIN TUMOR PATIENTS

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INTRODUCTION

- ❖ Cognitive impairment is often present throughout the disease trajectory for patients with central nervous system malignancies, such as primary brain tumors.
- ❖ Cognitive testing is routinely used to assess for cognitive impairment and to measure as a clinical trial endpoint for therapeutic and supportive care trials.
- ❖ Understanding the factors that influence cognitive testing metrics is critical in the interpretation of clinical outcomes and endpoints of clinical trials.

OBJECTIVE

- ❖ We sought to understand the contribution of tumor laterality (right sided tumor vs. left sided tumor) on cognitive testing in patients with primary brain tumors.

METHODS

- ❖ We queried the cognitive testing performance from two clinical trials that enrolled newly diagnosed high-grade glioma patients that were undergoing concurrent radiation therapy and chemotherapy.
- ❖ Study 1 (NCT01303835): Randomized placebo controlled study of low-dose naltrexone for treatment-related fatigue in newly diagnosed patients with high grade glioma
- ❖ Study 2 (NCT01740528): Phase II trial of bevacizumab, radiation therapy, and temozolomide followed by bevacizumab and temozolomide with continuation of bevacizumab beyond progression in newly diagnosed patients with glioblastoma
- ❖ Cognitive testing in both studies was performed with computerized program CNS Vital Signs® and included domains of executive functioning, reaction time, cognitive flexibility, psychomotor speed, verbal memory, and visual memory.
- ❖ Mean standardized score for normative age-matched subjects for all NC domains is 100 and lower scores identify poorer NC performance.
- ❖ We described the laterality of the tumors at diagnosis as being either right sided or left sided.
- ❖ We compared the performance on cognitive testing for all patients in relation to the laterality of the tumor.

PATIENT CHARACTERISTICS

TABLE 1. Patient Characteristics

Characteristic		Study 1 Right		Study 1 Left		Study 2 Right		Study 2 Left	
		N	%	N	%	N	%	N	%
Sex	Female	21	41.2	26	46.4	9	31.0	11	30.6
	Male	30	58.8	30	53.6	20	69.0	25	69.4
Tumor Extent	Multifocal	9	17.6	5	8.9	4	13.8	3	8.3
	Unifocal	42	82.4	51	91.1	25	86.2	33	91.7
KPS	100	2	3.9	5	8.9	2	6.9	0	0
	90	26	51.0	23	41.1	13	44.8	21	58.3
	80	18	35.3	21	37.5	13	44.8	12	33.3
	≤70	5	9.8	7	12.5	1	3.4	3	8.3

CONCLUSIONS

- ❖ Lesion laterality is important in the interpretation of cognitive testing performed for primary brain tumor patients for complex cognitive domains such as cognitive flexibility and executive functioning but not for simpler memory domains.
- ❖ Based on these observations, one should consider tumor laterality on analysis of complex cognitive testing in primary brain tumor patients.

RESULTS

FIGURE 1: Cognitive Testing from Study 1 Comparing Right Sided and Left Sided Tumor Location

FIGURE 2: Cognitive Testing from Study 2 Comparing Right Sided and Left Sided Tumor Location