

chemotherapy, and/or radiation therapy), which can diminish quality of life. Routine monitoring of cognitive symptoms in survivorship is recommended and can help address patient needs and inform clinical interventions (e.g., cognitive rehabilitation). While several patient-reported outcome (PRO) measures have been used in brain tumor populations, there has been few studies comparing the performance of these PROs in patients with diffuse glioma. In order to better understand the value of different PROs, we conducted preliminary analyses associating cognitive PROs with neuropsychological impairment in a well-characterized sample of patients with diffuse glioma.

Participants and Methods: 23 glioma patients (mean aged 44.26 ± 12.24), six or more months after completing cancer treatment, underwent comprehensive psychosocial and neuropsychological assessments. The neuropsychological battery included the Hopkins Verbal Learning Test – Revised, Brief Visuospatial Memory Test – Revised, Wechsler Adult Intelligence Scale-IV tests of Coding and Digit Span, Trail-Making Test, Stroop Test, FAS, Animals, Boston Naming Test, and Rey-Osterrieth Complex Figure (copy). Completed cognitive PROs included the Functional Assessment of Cancer - Cognitive Function and Brain questionnaires (FACT-Cog; FACT-Br), the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire for Brain Neoplasms (EORTC QLQ-BN20), and the Multidimensional Fatigue Symptom Inventory, short form (MFSI-SF) Mental subscale. Based on published norms, we divided the sample into cognitively impaired and non-impaired groups (two or more primary neuropsychological test scores ≤ -2 z-score). We compared PRO scores between impaired and non-impaired groups using Mann-Whitney U tests. Higher medians equate to better cognitive functioning for all PROs, except for the MFSI-SF.

Results: We found significantly worse scores in the impaired group compared to non-impaired group on the FACT-Cog subscales of perceived cognitive ability (PCA), [Non-Impaired (Mdn = 21, n = 11), Impaired (Mdn = 10, n = 12), U = 22.5, z = -2.68, p = 0.007], perceived cognitive impairment (PCI), [Non-Impaired (Mdn = 59, n = 11), Impaired (Mdn = 44, n = 12), U = 32.5, z = -2.06, p = 0.039]. The impaired group also trended towards worse scores on the FACT-Br additional concerns subscale [Non-Impaired (Mdn = 79.5, n = 10), Impaired (Mdn = 61, n = 12), U = 32.5,

z = -1.81, p = 0.07]. Group differences were not observed on the MFSI-SF [Non-Impaired (Mdn = 5, n = 11), Impaired (Mdn = 7, n = 12), U = 40.5, z = -1.57, p = 0.12], or EORTC Cognitive Functioning subscale [Non-Impaired (Mdn = 83.33, n = 10), Impaired (Mdn = 75, n = 12), U = 42, z = -1.23, p = 0.218].

Conclusions: The preliminary findings suggest that the FACT-Cog, especially the PCA and PCI correspond with neuropsychological impairment among diffuse glioma survivors better than other cognitive PROs. The FACT-Br subscale was somewhat effective. The MFSI-SF Mental and EORTC Cognitive Functioning subscales did not correspond to impairment status. The FACT-Cog is a promising instrument and future work is needed to better determine relative utility of cognitive PROs in this population.

Categories: Cancer

Keyword 1: brain tumor

Keyword 2: neuro-oncology

Keyword 3: cognitive functioning

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18 Executive Dysfunction Following Treatment for Pediatric Low Grade Brain Tumors: Increased Risk Associated with Infratentorial Tumor Location

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Objective: Treatment for pediatric brain tumors (PBTs) is associated with neurocognitive risk, including declines in IQ, executive function, and visual motor processing. Low grade tumors

require less intensive treatment (i.e., focal radiotherapy (RT) or surgical resection alone), and have been associated with more favorable cognitive outcomes. However, these patients remain at risk of cognitive problems, which may present differently depending on tumor location. Executive functioning (EF), in particular, has been broadly associated with both frontal-subcortical networks (supratentorial) and the cerebellum (infratentorial). The current study examined intellectual functioning, executive functioning (set-shifting and inhibition), and visual motor skills in patients who were treated for low-grade tumors located in either the supratentorial or infratentorial region.

Participants and Methods: Participants were survivors (age 8-18) previously treated with focal proton RT or surgery alone for infratentorial (n=21) or supratentorial (n=34) low grade glioma (83.6%) or low grade glioneuronal tumors (16.4%). Survivors >2.5 years post-treatment completed cognitive testing (WISC-IV/WAIS-IV; D-KEFS Verbal Fluency (VF), Color-Word Interference (CW), Trail Making Test (TM); Beery Visual-Motor Integration). We compared outcomes between infratentorial and supratentorial groups using analysis of covariance (ANCOVA). Demographic and clinical variables were compared using Welch's t-tests. ANCOVAs were adjusted for age at evaluation, age at treatment, and history of posterior fossa syndrome due to significant or marginally significant differences between groups.

Results: Tumor groups did not significantly differ with respect to sex (49.0% male), length of follow-up (M 4.4 years), or treatment type (74.5% surgery alone, 25.5% proton RT). Marginally significant group differences were found for age at evaluation (infratentorial M = 12.4y, supratentorial M = 14.1y, $p = .054$) and age at treatment (infratentorial M = 7.9y, supratentorial M = 9.7y, $p = .074$). Posterior fossa syndrome only occurred with infratentorial tumors (n=5, $p = .003$). Adjusting for covariates, the supratentorial group exhibited significantly superior performance on a measure of inhibition and set-shifting (CW Switching Time ($t(32) = -2.05$, $p = .048$, $\eta^2 = .11$). There was a marginal group difference in the same direction on CW Inhibition Time ($t(32) = -1.77$, $p = .086$, $\eta^2 = .08$). On the other hand, the supratentorial group showed significantly lower working memory than the infratentorial group ($t(50) = 2.45$, $p = .018$, $\eta^2 = .11$), and trends toward lower verbal reasoning ($t(50) = 1.96$, $p = .056$, $\eta^2 = .07$) and

full-scale IQ ($t(50) = 1.73$, $p = .090$, $\eta^2 = .055$). No other group differences were identified across intellectual, EF, and visual-motor measures.

Conclusions: Infratentorial tumor location was associated with weaker switching and inhibition performance, while supratentorial tumor location was associated with lower performance on intellectual measures, particularly working memory. These findings suggest that even with relatively conservative treatment (i.e., focal proton RT or surgery alone), there remains neurocognitive risk in children treated for low-grade brain tumors. Moreover, tumor location may predict distinct patterns of long-term neurocognitive outcomes, depending on which brain networks are involved.

Categories: Cancer

Keyword 1: brain tumor

Keyword 2: radiotherapy

Keyword 3: neuro-oncology

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19 Processing Speed and Academic Fluency in Childhood Survivors of Acute Lymphoblastic Leukemia Treated with Chemotherapy Only

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Objective: The purpose of this study using archival data was to examine processing speed (PS) and its relation with academic fluencies in children who were diagnosed with, and treated with chemotherapy for, acute lymphoblastic leukemia (ALL) before vs. after five years of age. Chemotherapy is the first-line treatment for childhood leukemias, and the impact of cancer treatment on academic and global functioning may include a steady decline in functions over time (Baron & Rey-Casserly, 2013). Specifically, this research initiative examined age and gender