

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

factors in PS and academic fluencies in this population.

Participants and Methods: Sixty-eight participants (39 M, 29 F; mean age 10.6 years) diagnosed with ALL and who were previously treated with chemotherapy were included.

Thirty-seven participants (23 M, 14 F) were <5 years of age at the time of diagnosis and onset of chemotherapy, while 31 participants (16M, 15 F) were ≥5 years of age at diagnosis and treatment. Participants ranged in age from 6 to 17 years at the time of their neuropsychological evaluation. Participants were given the WISC-V (PS subtests) and WJ-IV academic fluencies (math and reading). To evaluate research questions and hypotheses, correlational tests, independent samples t-tests, and analyses of variance (ANOVA) were used. Results at the $p < .05$ level are reported.

Results: There were significant correlations between PS and WJ math fluency ($r=.510$) and reading fluency ($r=.392$). Independent samples t-test analyses revealed that children who scored below 85 (standard score) on PS composite score demonstrated poorer performance on WJ math fluency ($t(60)=-3.971$, $p=.000$, $d=1.065$) and reading fluency ($t(56)=-3.041$, $p=.004$, $d=0.896$) compared to children whose PS scores were ≥ 85. For children whose PS scores were <85, mean scores were in the low average range for WJ-IV math fluency ($M=81.05$) and reading fluency ($M=84.50$). No significant differences were found for age or gender in relation to PS and academic fluencies.

Conclusions: Findings are important in highlighting the need for school accommodations in pediatric survivors of ALL. Processing speed is one of the most vulnerable functions impacted by cancer therapies and was positively correlated with reading and math fluencies in this study. Mean scores for math and reading fluencies were low average for age. In terms of academic accommodations, due to the slow processing speed of these boys and girls, regardless of their age at diagnosis and onset of chemotherapy, the provision for extra time for ALL survivors is recommended to ensure they are given the opportunity to maximize their learning potential and demonstrate their true academic abilities. Parents are encouraged to practice basic fluencies at home as early as possible. In-hospital and home-bound schooling supports are recommended to maintain educational progress. For children at higher risk for late effects and neurocognitive decline, rehabilitation

similar to that which TBI survivors receive can be effective, as well. Future prospective research, including longitudinal tracking, with more homogeneous samples of pediatric survivors of ALL is expected to extend and refine findings of the present study.

Categories: Cancer

Keyword 1: leukemia

Keyword 2: academic achievement

Keyword 3: pediatric neuropsychology

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20 The Relationship Between Quality of Life, Cognitive Functioning, and Tumor Grade Level in Brain Tumor Patients

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Objective: The goal of the current study is to compare QoL between tumor grade levels (i.e., low vs high) as well as the relationship between QoL, cognition, and tumor grade.

Participants and Methods: Participants were 156 individuals diagnosed with a brain tumor who completed neuropsychological evaluation within an interdisciplinary brain tumor clinic (mean age=51.67; SD=15.0; mean education=13.98; SD=2.6; 59% male). Independent samples T-Test was utilized to review participants' reported overall quality of life (QoL) on the FACT-Br in relation to tumor grade level (i.e., high vs low). Linear regression analysis was utilized to determine which cognitive variable may be most predictive of QoL.

Results: Results of the Independent T-test demonstrated that low and high tumor grade level groups did not significantly differ in total or individual sub-domain QoL. With regard to the regression analysis, cognitive variables as measured by TMT B, HVLT delayed recall, and FAS accounted for significant variance in quality of life in both low grade and high grade tumor groups (low tumor grade level effect size $R^2 = 0.21$; high tumor grade level effect size $R^2 = 0.19$). However, TMT B emerged as a significant predictor of QoL in only the low grade group, while cognitive performance within these same