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Objective: Sexual dimorphism in human brain structure and behavior is influenced by exposure to sex hormones during critical developmental periods. In children, cancer and cancer treatments may alter hormone activity and brain development, impacting neurocognitive functions.
Participants and Methods: Five-year survivors of childhood cancer (N=15,560) diagnosed at <21 years from 1970 to 1999, and 3,206 siblings from the Childhood Cancer Survivor Study completed the Neurocognitive Questionnaire (NCQ), a measure of self-reported task efficiency (TE), emotion regulation (ER), Organization, and working memory (WM). We compared rates of cognitive impairment (i.e., NCQ scores >90th percentile) in survivors and same-sex siblings, and sex differences in risk factors for cognitive impairment (i.e., treatment exposures, chronic health conditions (CHCs), cancer diagnosis, age at diagnosis) using modified Poisson regressions.
Results: Survivors were more likely to report cognitive impairment than same-sex siblings (Males: TE OR=2.3, p<.001; ER OR=1.7, p=.008; Organization OR=1.5, p=.04; WM OR=2.3, p<.001. Females: TE OR=2.6, p<.001; ER OR=1.9, p<.001; Organization OR=1.5, p=.02; WM OR=2.6, p<.001). Within survivors, females were more likely than males to report impairment in TE (OR=1.2, p=.001), ER (OR=1.5, p<.001), and WM (OR=1.2, p<.001). There were no sex differences in symptom severity in siblings (all ps>.05). Risk factors for cognitive impairment in survivors included cranial radiation dose (TE <20Gy OR=1.5, p=.008, ≥20Gy OR=2.5, p<.001; ER OR=1.5, p<.001; Organization <20 Gy OR=1.4, p<.001; < WM 20 Gy OR=1.8, p<.001, ≥20Gy OR=2.7, p<.001), presence of moderate to severe CHCs (TE 1 CHC OR=1.9, p<.001, >1 CHC OR=3.6, p<.001; ER 1 CHC OR=1.7, p<.001, >1 CHC OR=2.2, p<.001; Organization 1 CHC OR=1.5, p=.001, >1 CHC OR=2.5, p<.001; WM 1 CHC OR=1.8, p<.001, >1 CHC OR=4.1, p<.001). There were sex differences in cognitive impairment risk factors in survivors. In females, cranial radiation dose (<20 Gy TE OR=1.6, p=.02; ≥20Gy TE OR=1.4, p=.01), leukemia diagnosis (TE OR=1.4, p=.02), or diagnosis age between 3-5 years (WM OR=1.4, p=.02) conferred higher risk for cognitive impairment compared to males with the same history. Females diagnosed with Hodgkin's lymphoma (Organization OR=0.61, p=.05) or non-Hodgkin's lymphoma (Organization OR=0.55, p=.03) were at lower risk for cognitive impairment compared to males.
Conclusions: We found sex-specific differences in rates of, and risk factors for, neurocognitive impairment, suggesting a sex vulnerability. Future studies examining interactions between sex hormones and treatment exposures during brain development will enable tailoring treatments follow-up interventions to ensure that quality of life is maximized.

Categories: Cancer
Keyword 1: cognitive functioning
Keyword 2: cancer
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6 Graph Analysis of Resting State Functional Brain Networks and Associations with Cognitive Outcomes in Survivors on Pediatric Brain Tumor

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Objective: Adolescent and young adult survivors of pediatric brain tumors often live with long-term neuropsychological deficits, which have been found to be related to functional and structural brain changes related to the presence of the tumor itself as well as treatments such as radiation therapy. The importance of brain networks has become a central focus of research over recent decades across neurological populations. Graph theory is one way of analyzing network properties that can describe the integration, segregation, and other aspects of network organization. The existing literature using graph theory with survivors of brain tumor is small and inconsistent; therefore,

https://doi.org/10.1017/S135561772300437X Published online by Cambridge University Press

more work is needed, particularly in survivors of pediatric brain tumors. The present study used graph theory to determine whether functional network properties in this population differ from healthy controls; whether graph metrics relate to core cognitive skills: attention, working memory, and processing speed; and whether they relate to a cumulative measure of neurological risk.
Participants and Methods: 31 survivors and 31 matched controls completed neuropsychological testing including measures of attention, working memory, and processing speed. They also underwent resting state functional magnetic resonance imaging. Resting state data were preprocessed and spatially constrained independent component analysis was completed to construct connectivity matrices. Finally, graph metrics were calculated utilizing an area under the curve method, including global efficiency, clustering coefficient, betweenness centrality, and small-worldness. Group differences and associations between graph metrics, cognitive outcomes, and neurological risk were analyzed using SPSS version 28.0.
Results: Results revealed a significant difference such that brain tumor survivors exhibited less small-world properties in their functional brain networks. This was found to be related to working memory, such that less small-worldness in the network was related to poorer performance. There were no significant relationships with neurological risk, but there were nonsignificant correlations of small-moderate effect size such that lower global efficiency and clustering coefficient were associated with greater neurological risk. Comparisons to structural network analysis from a similar sample and additional post-hoc analyses are also discussed.
Conclusions: These findings reveal that survivors of pediatric brain tumor indeed display significant differences in functional brain networks that are quantifiable by graph theory. It is also possible that, with further work, we might better understand how metrics such as small-worldness can be used to predict long-term cognitive outcomes and functional independence in adulthood.

Categories: Cancer
Keyword 1: neuroimaging: functional connectivity
Keyword 2: cognitive functioning
Keyword 3: brain tumor

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Poster Session 04: Aging | MCI

2:30 - 3:45pm
Thursday, 2nd February, 2023
Town & Country Foyer

1 Social Support is Associated with Better Memory Performance among Hispanic/Latino, but not Non-Hispanic White Older Adults

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Objective: Hispanic/Latino (H/L) older adults are at greater risk of developing Alzheimer's disease and related dementias compared to non-Hispanic whites (NHW), and there is an urgent need to identify important factors that may help prevent and/or reduce age-related cognitive health disparities. Positive psychosocial factors, such as social support, may protect against cognitive impairment and decline. However, recent research has highlighted that the effect of social support on cognitive outcomes may differ across racial/ethnic groups. Given the emphasis placed on family relationships and support in H/L culture, the current study sought to clarify whether H/L ethnicity moderated the association between social support and cognitive functioning in a well-characterized sample of community-dwelling older adults residing in Texas.
Participants and Methods: Participants included 766 NHW and 817 H/L (predominantly Mexican American) older adults (M_{age} = 66.25 ± 8.64) without dementia enrolled in the Health and Aging Brain Study-Health Disparities. Participants completed study questionnaires and a comprehensive neuropsychological battery. Perceived social support was measured using the total sum score from the 12-item abbreviated version of the Interpersonal Support Evaluation List. Episodic memory performance was

https://doi.org/10.1017/S135561772300437X Published online by Cambridge University Press