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23 Tamoxifen Effects on Cognition and Language in Women with Breast Cancer

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Objective: Cognitive changes following adjuvant treatment for breast cancer (BC) are well documented particularly following chemotherapy. However, limited studies have examined cognitive and/or language functions in chemotherapy-naive women with BC taking tamoxifen (TAM). While there is some compelling evidence TAM affects cognitive and language domains, language has not been studied beyond semantics (i.e., content of language), which is just one aspect of language. Using ambulatory cognitive assessment, we investigated the trajectory of cognitive and language changes during early period of adjuvant endocrine treatment (tamoxifen) in women with BC at two time periods (pre-treatment and two months after treatment begins).

Participants and Methods: Four women with BC (mean age = 62.25 years, SD = 8.38) and 18 cognitively healthy age-matched controls (mean age = 59.77, SD = 7.45) completed 3 cognitive tasks using smartphones, during a short time period (5 days) and repeated at two time periods. Symbol search, dot memory and color dots tasks were used to measure the cognitive constructs - processing speed and working memory. Response times were recorded in milliseconds. To determine language ability, language samples were collected at two time periods, where the participants described two stories from two wordless picture books and samples were assessed using core lexicon analyses.

Results: Wilcoxon-signed rank test was computed to identify cognitive and linguistic changes during early period of TAM administration in women with BC at two time periods. No significant within group or between group differences were seen on the cognitive and language tasks at the two time periods, however, a trend for decline in performance was seen in some BC participants across different tasks.

Conclusions: This is the first study to our knowledge to use ambulatory cognitive assessment method and study discourse-level language function during this early period (pre-treatment and 2 months post-TAM). Findings from the current study advance our understanding of trajectories of cognition and language changes during the initial course of adjuvant endocrine treatment for women with BC with ER+ tumors. Using a measurement-burst design and ambulatory cognitive assessment, we were able to apply better precision measurement to identify distinct cognitive constructs affected by adjuvant endocrine treatment. In addition, insight into changes in discourse ability are impactful for numerous reasons: (1) better understanding of how adjuvant endocrine therapy impacts communication and (2) discernment into language domains that may require early behavioral intervention.

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24 Adaptive Functioning and Academic Achievement in Survivors of Childhood Acute Lymphoblastic Leukemia

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Objective: Executive functioning (EF) and socioeconomic status (SES) are associated with functional outcomes (adaptive functioning and academic achievement) in healthy controls and pediatric populations with executive dysfunction. However, these relationships have yet to be investigated in survivors of childhood acute lymphoblastic leukemia (ALL), a population with EF impairment resulting from disease and treatment characteristics. The objective of this study was to examine the associations of functional outcomes with EF and SES

(neighborhood-specific variables and academic support) in survivors of childhood ALL.

Participants and Methods: Forty-four participants (38.6% female, 72.7% non-Hispanic White, ages 6-17) previously diagnosed with low-risk or standard-risk pre-B cell ALL and treated with chemotherapy-only were included. Participants were evaluated on performance-based measures of EF (cognitive flexibility, verbal fluency, working memory, and processing speed) and academic achievement (word reading and math calculation), and parent-ratings of EF and adaptive functioning. All measures were expressed as T-scores with lower scores indicating better performance. Neighborhood-specific variables were based on participants' zip codes and census block group, and included area deprivation index (ADI) and child opportunity index (COI). Lower ADI and COI indicate lesser deprivation and greater opportunity. Individualized education plan (IEP) status was used as a proxy of academic support, coded dichotomously as with or without IEP. Percentages of participants showing impairments in functional outcomes were calculated using a cutoff of ≥ 1 SD above the normative mean. Partial correlations were conducted while controlling for age at evaluation, age at diagnosis, sex, and verbal IQ, to examine whether participants with poorer performance-based and parent-rated EF would show reduced functional outcomes. Multiple regression analyses were conducted to evaluate whether neighborhood-specific variables and IEP status would predict functional outcomes while controlling for covariates.

Results: Compared to population norms, survivors of childhood ALL showed worse functional outcomes. Within adaptive functioning, 45.5% of participants showed impairment in activities of daily living and leadership. Adaptive functioning was significantly positively correlated with parent-rated, but not performance-based, EF ($r=0.694$, $p<0.001$). Compared to female survivors, male survivors were at increased risk for adaptive functioning difficulties ($r=-0.401$, $p<0.05$). Impairments for word reading and math calculation were 25% and 41.7%, respectively. Greater math calculation was associated with better verbal fluency ($r=0.378$, $p<0.05$) and processing speed ($r=0.439$, $p<0.05$). Older participants at evaluation ($\beta=-0.580$, $p<0.001$) and those without IEP support ($\beta=0.465$, $p<0.05$) showed better word reading. Lower ADI predicted better verbal fluency ($\beta=0.282$, $p=0.041$), however, neighborhood-specific variables were not associated with functional outcomes.

Conclusions: Prior findings indicate that performance-based measures and parent-ratings assess different constructs of EF. Thus, adaptive functioning may relate more to the behavioral construct of EF than its cognitive construct. Current findings also suggest that male survivors are at increased risk for reduced adaptive functioning, consistent with recent reports that male survivors of ALL are at greater risk for specific neurocognitive outcomes. Overall, functional outcomes may be more strongly related to EF than neighborhood-specific variables. Long-term goals include early screening of adaptive and academic difficulties, targeted intervention, and neuropsychological monitoring to support pediatric survivors' neurocognitive and psychosocial development.

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25 High-resolution MRI Reveals Selective Patterns of Hippocampal Subfield Atrophy in Focal Epilepsy

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Objective: Hippocampal pathology is a consistent feature in persons with temporal lobe epilepsy (TLE) and a strong biomarker of memory impairment. Histopathological studies have identified selective patterns of cell loss across hippocampal subfields in TLE, the most common being cellular loss in the cornu ammonis 1 (CA1) and dentage gyrus (DG).