

27 Assessing Differences in Academic Achievement Among a National Sample of Children with Epilepsy Before and During the COVID-19 Pandemic

Brandon Almy¹, Lauren Scimeca², David Marshall¹, Brittany L. Nordhaus¹, Erin Fedak Romanowski¹, Nancy McNamara¹, Elise Hodges¹, Madison M. Berl³, Alyssa Ailion⁴, Donald J. Bearden⁵, Katrina Boyer⁴, Crystal M. Cooper⁶, Amanda M. Decrow⁷, Priscilla H. Duong², Patricia Espe-Pfeifer⁸, Marsha Gabriel⁶, Jennifer I. Koop⁹, Kelly A. McNally¹⁰, Andrew Molnar¹¹, Emily Olsen¹², Kim E. Ono⁵, Kristina E. Patrick¹³, Brianna Paul¹⁴, Jonathan Romain¹⁵, Leigh N. Sepeta³, Rebecca L.H. Stilp¹⁶, Greta N. Wilkening¹⁷, Mike Zaccariello¹⁸, Frank Zelko²

¹University of Michigan, Ann Arbor, MI, USA. ²Ann and Robert H. Lurie Children's Hospital of Chicago, Chicago, IL, USA. ³Children's National Hospital, Washington, DC, USA. ⁴Boston Children's Hospital, Boston, MA, USA. ⁵Children's Hospital of Atlanta, Atlanta, GA, USA. ⁶Cook Children's Medical Center, Fort Worth, TX, USA. ⁷Atrium Health/Levine Children's Hospital, Charlotte, NC, USA. ⁸University of Iowa, Iowa City, IA, USA. ⁹Children's Wisconsin/Medical College of Wisconsin, Milwaukee, WI, USA. ¹⁰Nationwide Children's Hospital, Columbus, OH, USA. ¹¹Vanderbilt Kennedy Center, Nashville, TN, USA. ¹²Oregon Health & Science University, Portland, OR, USA. ¹³University of Washington/Seattle Children's Hospital, Seattle, WA, USA. ¹⁴University of California San Francisco, San Francisco, CA, USA. ¹⁵Children's Hospital of Orange County, Orange, CA, USA. ¹⁶Norton Healthcare, Louisville, KY, USA. ¹⁷Children's Hospital of Colorado, Aurora, CO, USA. ¹⁸Mayo Clinic, Rochester, MN, USA

Objective: The COVID-19 pandemic significantly disrupted schools and learning formats. Children with epilepsy are at-risk for generalized academic difficulties. We investigated the potential impact of COVID-19 on learning in those with epilepsy by comparing achievement on well-established academic measures among school-age children with epilepsy referred prior to the COVID-19 pandemic and those referred during the COVID-19 pandemic.

Participants and Methods: This study included 466 children [52% male, predominately White (76%), $M_{Age}=10.75$ years] enrolled in the Pediatric Epilepsy Research Consortium Epilepsy (PERC) Surgery database project who were referred for surgery and seen for neuropsychological testing. Patients were divided into two groups based on a proxy measure of pandemic timing completed by PERC research staff at each site (i.e., "were there any changes to typical in-person administration [of the evaluation] due to COVID?"). 31% of the sample ($N = 144$) were identified as having testing during the pandemic (i.e., "yes" response), while 69% were identified as having testing done pre-pandemic (i.e., "no" response). Of the 31% who answered yes, 99% of administration changes pertained to in-person testing or other changes, with 1% indicating remote testing. Academic achievement was assessed by performance measures (i.e., word reading, reading comprehension, spelling, math calculations, and math word problems) across several different tests. T-tests compared the two groups on each academic domain. Subsequent analyses examined potential differences in academic achievement among age cohorts that approximately matched grade level [i.e., grade school (ages 5-10), middle school (ages 11-14), and high school (ages 15-18)].

Results: No significant differences were found between children who underwent an evaluation before the pandemic compared to those assessed during the pandemic based on age norms across academic achievement subtests (all p 's > .34). Similarly, there were no significant differences among age cohorts. The average performance for each age cohort generally fell in the low average range across academic skills. Performance inconsistently varied between age cohorts. The youngest cohort (ages 5-10) scored lower than the other cohorts for sight-word reading, whereas this cohort scored higher than the middle cohort (ages 11-14) for math word problems and reading comprehension. There were no significant differences between the two pandemic groups on demographic variables, intellectual functioning, or epilepsy variables (i.e., age of onset, number of seizure medications, seizure frequency).

Conclusions: Academic functioning was generally equivalent between children with epilepsy who underwent academic testing as part of a pre-surgical evaluation prior to the pandemic compared to those who received testing during the pandemic. Additionally,

academic functioning did not significantly differ between age cohorts. Children with epilepsy may have entered the pandemic with effective academic supports and/or were accustomed to school disruptions given their seizure history. Replication is needed as findings are based on a proxy measure of pandemic timing and the extent to which children experienced in-person, remote, and hybrid learning is unknown. Children tested a year into the pandemic, after receiving instruction through varying educational methods, may score differently than those tested earlier. Future research can address these gaps. Although it is encouraging that academic functioning was not disproportionately impacted during the pandemic in this sample, children with epilepsy are at-risk for generalized academic difficulties and continued monitoring of academic functioning is necessary.

Categories: Epilepsy/Seizures

Keyword 1: academic achievement

Keyword 2: pediatric neuropsychology

Keyword 3: academic skills

Correspondence: Brandon Almy University of Michigan
albrando@med.umich.edu

28 Challenges to Lateralizing Visual Memory Dysfunction in TLE Patients

Chantal Muller-Cohn¹, Carrie McDonald²,
Amanda Gooding², Marc Norman²

¹Alliant International University, San Diego, CA, USA. ²University of California, San Diego, CA, USA

Objective: Neuropsychological assessment is an essential part of presurgical evaluation for epilepsy patients with refractory temporal lobe epilepsy. Evaluations assist in localizing and lateralizing epileptogenic focal points and identifying possible risks for cognitive decline following surgery. Researchers and clinicians consistently find that verbal memory dysfunction is an accurate indicator of left temporal lobe epilepsy (TLE) through verbal measures such as the CVLT-II. Although visual memory structures are assumed to be in the right (nondominant) hemisphere, visual memory assessments have not been reliable in identifying right TLE. It is hypothesized that assessments to test visual memory are confounded by verbal cueing to assist in visual learning. To account for this,

researchers have identified that comparing verbal and visual score asymmetries does accurately differentiate left and right TLE patients. This study aimed to determine if verbal-visual asymmetry using the CVLT-II and BVMT-R accurately identifies left and right TLE relative weaknesses potentially associated with epileptogenic regions.

Participants and Methods: As part of a pre-surgical neuropsychological evaluation, 37 well-characterized medically refractory TLE patients (18 right TLE; 19 left TLE) were administered the Brief Visuospatial Memory Test-Revised to evaluate visuospatial memory and the CVLT-II to evaluate verbal memory. A multivariate analysis of variance was used to compare RTLE and LTLE group performances on BVMT-R delay recall subscales, using T-scores. Then memory asymmetry scores were calculated by converting CVLT-II verbal delay memory scores to T-scores and subtracting BVMT-R delayed recall T-score from the verbal memory T-score. An independent samples t-test was used to compare asymmetry scores between the groups.

Results: There were no significant differences between patients with RTLE and LTLE for BVMT-R Delay [$F(2,34) = 0.11, p = .895$]. There was not a significant difference when accounting for verbal-visual asymmetry ($t(35) = 0.422, p = 0.675, d = 12.566$) between left ($M = -2.42, SD = 13.82$) and right side ($M = -4.17, SD = 11.09$).

Conclusions: The BVMT-R did not identify nondominant hemisphere dysfunction in this sample of 18 right TLE patients. Because visual memory performance did not inform lateralization, we investigated the usefulness of memory asymmetry. Inconsistent with our hypothesis, verbal-visual memory asymmetry scores did not differentiate RTLE from LTLE in this sample. These findings add to existing findings that the BVMT-R may not be able to identify visuospatial memory dysfunction in epilepsy. Additionally, these data indicate the inability to assess for visuospatial memory even when accounting for verbal abilities in epilepsy patients. Future research should consider alternate visuospatial measures for the evaluation of epilepsy patients.

Categories: Epilepsy/Seizures

Keyword 1: epilepsy / seizure disorders

Keyword 2: neuropsychological assessment