

Initial Disease Severity Predicts Executive Functioning in Children with Anti-NMDA Receptor Encephalitis (NMDARE)

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Background

Executive functioning (EF) and memory deficits are primary cognitive concerns following (NMDARE) in adults and children, although predictors of cognitive outcomes remain poorly understood.

Delay in treatment is predictive of worse outcomes for adults, but this has not been reported with children.

Objective: We aim to fill this gap by investigating predictors of memory and EF in children with anti-NMDA receptor encephalitis

Participants

12 pediatric NMDARE patients with Neuropsychological evaluation.

| Participant characteristics | |
|---|-------------------|
| Mean age at evaluation | 11.6 yrs (SD 4.2) |
| Child gender | |
| Female | 7 |
| Male | 5 |
| Mean time from dx to evaluation | 21.1 m |
| Disease related characteristics (at presentation) | |
| Seizures | 33 % |
| Abn MRI | 66 % |
| Abn EEG | 75 % |
| Premorbid Neurodevelopmental Hx | 16.7% |
| Mean time to treatment | |
| From admission | 6 days (SD 5.9) |
| From symptom onset | 16 days (SD 11.1) |

Measures

Executive functioning: BRIEF-2, TOL-Dx

Memory: WRAML-II Stories

Predictors: premorbid developmental concerns; modified Rankin Scale (mRS, at admission); length of hospital stay (LOS), and other disease-related factors (i.e., presence of abnormal MRI and/or EEG on admission, seizures on admission, ICU stay, time to treatment from initial symptom presentation and admission)

Analyses:

Percentages of clinically significant (T>65) parent-reported concerns with daily executive functioning were calculated

Linear regression models examined several predictors of neurocognitive outcome in pediatric ANMDARE patients

Results

Approximately one-third of parents reported elevated daily EF concerns, while mean scores were broadly average across objective memory and EF measures

mRS predicted ratings of daily EF overall, accounting for 59.6% of the variance ($p=0.01$, $n=10$, Figure 1), as well as metacognitive skills at the trend level ($p=.056$, $R^2=.43$, $n=10$).

LOS predicted EF across objective and parent-report measures (BRIEF-2 ERI, $p=.02$; TOL-Dx, Total Correct, $p=.04$), accounting for 55-68.3% of variance respectively (Figure 2).

History of premorbid neurodevelopmental concerns also predicted higher-order executive planning (TOL-Dx Total Correct, $p=.03$, $R^2=.63$).

No variables predicted verbal memory performance.

Figure 1: mRS and BRIEF-2 GEC

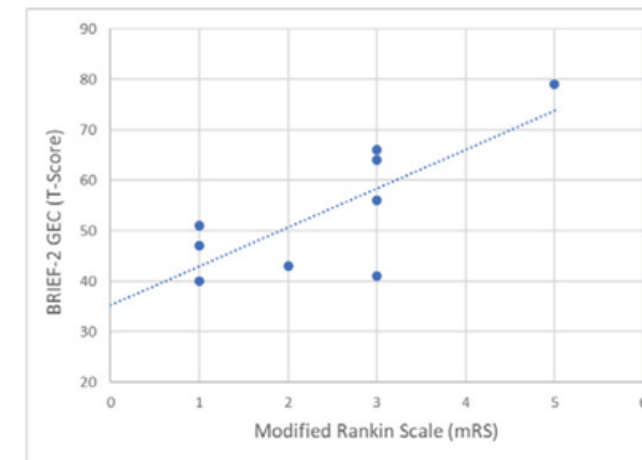
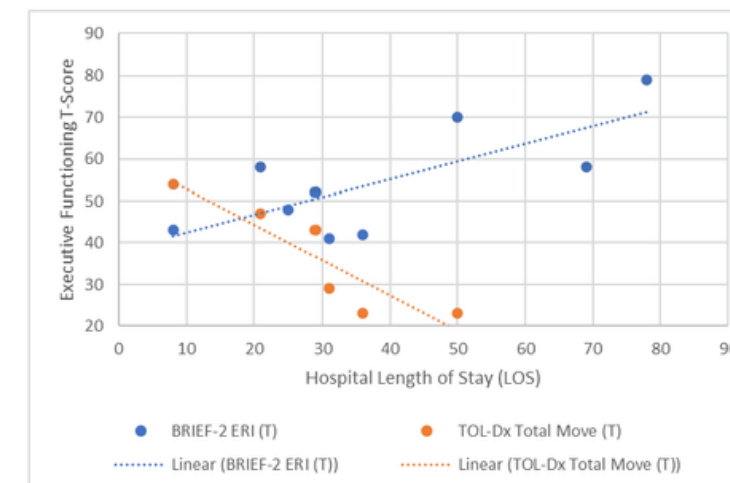


Figure 2: LOS and Executive Functioning (BRIEF-2 ERI and TOL-DX Move Score)**



**NOTE: On the BRIEF-2, higher -scores indicate more significant concerns with daily executive functioning. Conversely, on the TOL-Dx, higher T-scores indicate better performance.

Conclusions

Results highlighted the relative vulnerability of day-to-day executive functioning in this population.

Findings suggest that initial disease severity is helpful in predicting EF and self-regulation in children with NMDARE.

Further study with additional patients will be important to determine the clinical utility of disease severity and neurodevelopmental history in informing prognosis for neurocognitive functioning in this population.

