Neuropsychological Functioning in Pediatric Demyelinating Diseases: A Comparison Between Multiple Sclerosis (MS) and Acute Disseminated Encephalomyelitis (ADEM)

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Objective: Research has demonstrated brain-based pathology and deficits in neuropsychological functioning in pediatric multiple sclerosis (MS) and acute disseminated encephalomyelitis (ADEM). Recent literature suggests the monophasic white matter disruption in ADEM may result in subtler cognitive impairments compared to the recurrent white matter damage associated with MS. The present objective is to investigate differences in neuropsychological functioning between pediatric-onset MS and ADEM samples. It was hypothesized MS patients would show greater deficits in neuropsychological functioning compared to ADEM patients.

Method: Forty-six participants (mean age = 15.3 years) diagnosed with MS and 11 participants (mean age = 7.1 years) diagnosed with ADEM were administered a neuropsychological screening battery during a specialty clinic visit. All participants were at least 30 days from acute event or steroid use.

Results: Independent t-tests revealed statistically significantly (p < .05) lower performance in the MS sample compared to the ADEM sample on California Verbal Learning Test, Beery-Buktenica Developmental Test of Visual-Motor Integration (VMI) Visual Perception, and Symbol Search. Independent t-tests revealed no significant differences between samples on Delis-Kaplan Executive Function System Letter Fluency, Grooved Pegboard, or Beery VMI.

Conclusion: Results confirm the hypothesis that MS patients show poorer neuropsychological functioning compared to ADEM patients, especially greater verbal memory, processing speed, and visual perception deficits. Results also suggest ADEM patients may have more difficulty with verbal and motor functioning similar to what is seen in pediatric MS.

Limitations include a relatively smaller and younger sample of ADEM patients. Future research should include a larger ADEM sample to make comparisons in neuropsychological functioning.