both visual and auditory, stopped early in her recovery post-TBI; patient's premorbid delusions were still present post-TBI.
Conclusions: This case raises questions related to the impact of structural or axonal injury to regions or networks in the brain that may be associated with psychosis. It also adds to a minimal literature examining AVH in pediatric TBI. Using the current literature as a framework we will explore 1) the injury to this patient's thalamus as it relates to both her emotional memory deficits as well as the interruption of her AVH hallucinations, and 2) the relationship between her visual field cut and the interruption of her visual hallucinations. Overall, this case study highlights the unique nature of the developing brain both in terms of the TBI and psychosis.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Child)
Keyword 1: psychosis
Keyword 2: traumatic brain injury
Keyword 3: adolescence
Correspondence: Diana M. Ohanian, Ph.D., University of Michigan: Physical Medicine and Rehabilitation, dmohanian@gmail.com

33 Osteopontin as a Blood Biomarker for Executive Function Outcomes in Pediatric Traumatic Brain Injury

Ezra Mauer[1], Iqbal Sayeed[2], Andrew Reisner[3], Laura Blackwell[3]
[1]University of California, Berkeley, Berkeley, CA, USA. [2]Emory University, Atlanta, GA, USA. [3]Children's Healthcare of Atlanta, Atlanta, GA, USA

Objective: Executive function (EF) is a self-regulatory construct well-established as a predictor of long-term academic achievement and socioemotional functioning in children (Best et al., 2009; Diamond, 2013; Zelazo & Carlson, 2020). Traumatic brain injury (TBI) in childhood frequently results in EF deficits (Beauchamp & Anderson, 2013; Levin & Hanten, 2005). In comparison to adults (Okonkwo et al., 2013), there is an absence of viable blood biomarkers for pediatric TBI to assist in diagnosis and prognosis. Osteopontin (OPN), an inflammatory cytokine, has recently been identified as a putative pediatric TBI blood biomarker (Gao et al., 2020). However, more work is needed to establish OPN's utility in predicting functional outcomes. Thus, the present study aimed to test relations between OPN measured during the first 72 hours of hospitalization and EF 6-12 months post injury among a sample of pediatric TBI patients.
Participants and Methods: Sample consisted of 38 children (age at injury = 4.60-16.67 years, M_{age} = 10.61 years, 65.8% male, lowest Glasgow Coma Scale [GCS] score = 3-15, M_{GCS} = 9.97) with TBI whose parents completed the Behavior Rating Inventory of Executive Function, Second Edition (BRIEF-2; Gioia et al., 2015) 6-12 months post injury. Plasma OPN was measured at hospital admission, 24 hours after admission, 48 hours after admission, and 72 hours after admission. *T*-scores for each BRIEF-2 clinical scale (Inhibit, Self-Monitor, Shift, Emotional Control, Initiate, Working Memory, Plan/Organize, Task-Monitor, Organization of Materials) and composite index (Behavior Regulation Index, Emotion Regulation Index, Cognitive Regulation Index, Global Executive Composite) were used in analyses.
Results: Correlation analyses revealed large positive associations (*r*s = .50-.73, *p*s = <.001-.039) between 48-hour OPN and all BRIEF-2 scales/indices except Initiate. OPN at 24 hours positively correlated with Task-Monitor (r = .40, p = .037). Bivariate logistic regression analyses testing whether OPN predicted at least mildly elevated BRIEF-2 *t*-scores (≥60) did not yield significant associations. Additional supplementary analyses testing whether alternative injury markers - glial fibrillary acidic protein (GFAP), ubiquitin C-terminal Hydrolase-L1 (UCH-L1), S100 calcium binding protein B (S100B) - measured at all time points as well as lowest GCS score correlated with EF revealed the following: admission S100B positively correlated with Inhibit (r = .34, p = .045), 48-hour UCH-L1 negatively correlated with Initiate (r = -.49, p = .041) and Cognitive Regulation Index (r = -.48, p = .044), and 72-hour UCH-L1 negatively correlated with Initiate (r = -.47, p = .048).
Conclusions: Findings showed higher OPN at 48 hours post admission was broadly related to worse parent-reported EF 6-12 months later, with 24-hour OPN also showing limited associations. Higher levels of alternative injury markers likewise showed limited associations with EF outcomes. Null logistic regression findings may be due to few participants having

https://doi.org/10.1017/S1355617723002370 Published online by Cambridge University Press

elevated BRIEF-2 scores. Disrupted EF development may be more noticeable after longer time periods as children age and self-regulatory demands increase. Overall, OPN was found to more consistently predict EF outcomes than GCS score and other injury markers. This could be because OPN is a marker of inflammation, which may be particularly predictive of TBI cognitive outcomes.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Child)
Keyword 1: traumatic brain injury
Keyword 2: executive functions
Keyword 3: child brain injury
Correspondence: Ezra Mauer, University of California, Berkeley, ezra.mauer@berkeley.edu

34 Severity of Traumatic Brain Injury Predicts Neurobehavioral Outcomes and White Matter Microstructure

Julia Friedman[1], Kathryn Vannatta[1,2], William A Cunningham[3], Elisabeth A Wilde[4], Keith Owen Yates[5], Kristen R Hoskinson[1,2]
[1]Center for Biobehavioral Health, Abigail Wexner Research Institute, Columbus, OH, USA. [2]Section of Pediatrics, The Ohio State University College of Medicine, Columbus, OH, USA. [3]Department of Psychology, University of Toronto, Toronto, Canada. [4]Department of Neurology, University of Utah School of Medicine, Salt Lake City, Utah, USA. [5]University of Calgary College of Medicine, Calgary, Canada

Objective: Pediatric traumatic brain injury (TBI) is the leading cause of disability in children under the age of 15, often resulting in executive function deficits and poor behavioral outcomes. Damage to white matter tracts may be a driving force behind these difficulties. We examined if whether 1) greater TBI severity was associated with worse neurobehavioral outcome, 2) greater TBI severity was associated with tract-based white matter microstructure, and 3) worse neurobehavioral outcome was associated with white matter microstructure.
Participants and Methods: Twelve children with complicated-mild TBI (cmTBI; Mage=12.59, nmale=9), 17 with moderate-to-severe TBI (msTBI; Mage =11.50, nmale=11), and 21 with orthopedic injury (OI; Mage =11.60, nmale=16), 3.94 years post injury on average, were recruited from a large midwestern children's hospital with a Level 1 Trauma Center. Parents completed the Behavior Rating Inventory of Executive Function (BRIEF) and Child Behavior Checklist (CBCL) while children completed 64-direction diffusion tensor imaging in a Siemens 3T scanner. White matter microstructure was quantified with FMRIB's Diffusion Toolbox (FSLv6.0.4). Tract-Based Spatial Statistics computed fractional anisotropy (FA) and mean diffusivity (MD) for the cingulum bundle (CB), inferior fronto-occipital fasciculus (IFOF), superior longitudinal fasciculus (SLF), and uncinate fasciculus (UF), bilaterally.
Results: Group differences were assessed using one-way ANOVA. Children with msTBI were rated as having worse Sluggish Cognitive Tempo on the CBCL than children with cmTBI and OI (p=.02, eta2=.143); no other parent-rated differences reached significance. Group differences were found in left SLF FA (p=.031; msTBI<cmTBI=OI) and approached significance in left UF FA (p=.062, eta2=.114; msTBI<OI). Group differences were also found in right IFOF MD (p=.048; msTBI>OI) and left SLF MD (p=.013; msTBI>cmTBI=OI). Bivariate correlations assessed cross-domain associations. Higher left IFOF FA was associated with better BRIEF Metacognitive Skills (r=-.301, p=.030) and CBCL School Competence (r=.280; p=.049). Higher left SLF FA was associated with better BRIEF Behavioral Regulation and Metacognitive Skills (r=-.331, p=.017 and r=-.291, p=.036, respectively), and CBCL School Competence and Attention Problems (r=.398, p=.004 and r=-.435, p=.001, respectively). Similarly, higher right UF FA was broadly associated with better neurobehavioral outcomes, including Behavioral Regulation and Metacognitive Skills (r=-.324, p=.019 and r=-.359, p=.009, respectively), and School Competence, Attention Problems, and Sluggish Cognitive Tempo (r=.328, p=.020, r=-.398, p=.003, and r=-.356, p=.010, respectively). Higher right CB MD was associated with worse Behavioral Regulation (r=.327, p=.018) and more Attention Problems (r=.278, p=.046); higher left and right SLF MD was associated with Sluggish Cognitive Tempo (r=.363, p=.008, r=.408, p=.003, respectively).
Conclusions: Children with TBI, particularly msTBI, were rated as having cognitive slowing; while other anticipated group differences in neurobehavioral outcomes were not found, this

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