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9 Serum Neurofilament is Associated with Diffusion Kurtosis Imaging in Chronic Mild-Moderate Traumatic Brain Injury

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Objective: To determine the association between blood markers of white matter injury (e.g., serum neurofilament light and phosphorylated neurofilament heavy) and a novel neuroimaging technique measuring microstructural white matter changes (e.g., diffusion kurtosis imaging) in regions (e.g., anterior thalamic radiation and uncinate fasciculus) known to be impacted in traumatic brain injury (TBI) and associated with symptoms common in those with chronic TBI (e.g., sleep disruption, cognitive and emotional disinhibition) in a heterogeneous sample of Veterans and non-Veterans with a history of remote TBI (i.e., >6 months).
Participants and Methods: Participants with complete imaging and blood data (N=24) were sampled from a larger multisite study of chronic mild-moderate TBI. Participants ranged in age from young to middle-aged (mean age = 34.17, SD age = 10.96, range = 19-58) and primarily male (66.7%). The number of distinct TBIs ranged from 1-5 and the time since most recent TBI ranged from 0-30 years. Scores on a cognitive screener (MoCA) ranged from 22-30 (mean = 26.75). We performed bivariate correlations with mean kurtosis (MK) in the anterior thalamic radiation (ATR; left, right) uncinate fasciculus (UF; left, right), and serum neurofilament light (NFL), and phosphorylated neurofilament heavy (pNFH). Both were log transformed for non-normality. Significance threshold was set at $p<0.05$.
Results: pNFH was significantly and negatively correlated to MK in the right (r=-0.446) and left (r=-0.599) UF and right (r=-0.531) and left (r=-0.469) ATR. NFL showed moderate associations with MK in the right (r=-0.345) and left (r=-0.361) UF and little to small association in the right (r=-0.063) and left (r=-0.215) ATR. In post-hoc analyses, MK in both the left (r=0.434) and right (r=0.514) UF was positively associated with performance on a frontally-mediated list-learning task (California Verbal Learning Test, 2nd Edition; Trials 1-5 total).
Conclusions: Results suggest that serum pNFH may be a more sensitive blood marker of microstructural complexity in white matter regions frequently impacted by TBI in a chronic mild-moderate TBI sample. Further, it suggests that even years after a mild-moderate TBI, levels of pNFH may be informative regarding white matter integrity in regions related to executive functioning and emotional disinhibition, both of which are common presenting problems when these patients are seen in a clinical setting.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)
Keyword 1: traumatic brain injury
Keyword 2: neuroimaging: structural
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10 Accuracy of Chronic Traumatic Encephalopathy Knowledge Across Three Diverse Samples

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Objective: There are many common beliefs within the general public about Chronic Traumatic Encephalopathy (CTE) that contradict research findings and scientific evidence. Therefore, the goal of this study was to examine the accuracy of CTE knowledge across three diverse samples.
Participants and Methods: The three groups included in the sample were 333 college students (54%), 196 individuals from the public (32%), and 90 psychology trainees/clinicians (54%) for a total of 619 participants. Online surveys were used to collect the CTE knowledge accuracy (i.e., the number correct divided by the total number of questions) of the sample. The questions about CTE were adapted from Merz et al. (2017) and from the Sports Neuropsychology Society's "CTE: A Q and A Fact Sheet."
Results: Overall, CTE knowledge accuracy was 52% (M = 51%, SD = .24). Regarding inaccurate beliefs, two-thirds of the sample believed that CTE was related to sports participation alone even if a head injury did not occur, and most participants believed that CTE could be caused by a single injury. Additionally, confidence in CTE knowledge was positively correlated with willingness to allow their child to play a high contact sport despite overall low CTE knowledge accuracy. Last, many participants reported education (67%) and health care providers (61%) as their main sources of CTE information while only 18% of participants cited television/movies. However, when asked to provide additional details about their CTE information source, many participants cited ESPN specials and the movie "Concussion" as the main reason they learned of the condition and sought out additional information.
Conclusions: The results of this study are consistent with previous research on CTE knowledge accuracy. This further supports the need for clinicians and researchers to address misconceptions by providing information and scientific facts.

Categories: Acquired Brain Injury (TBI/Cerebrovascular Injury & Disease - Adult)
Keyword 1: brain injury
Keyword 2: traumatic brain injury
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11 The Moderating Effect of Depression on Workload Perception in Traumatic Brain Injury

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Objective: Individuals who have experienced traumatic brain injury (TBI) are at an elevated risk for worsened physical and psychological outcomes. Increased rates of anxiety and depression, along with cognitive issues, are common post-TBI. While there is some evidence that anxiety and depression may affect objective cognitive performance, less is known about their effect on other factors that are associated with the individual's capacity to complete the task, such as perceived workload of the cognitive task. Workload represents an individual's perception of task difficulty and serves as a proxy for the magnitude of mental demands a given task places on an individual. Preliminary findings in the literature suggest that individuals with TBI commonly report greater workload when completing cognitive tasks compared to neurotypical peers, but the influence of anxiety and depression on survivors' workload remains unclear. Considering the elevated rates of psychological and cognitive problems in individuals with TBI, the present study examined the moderating role of anxiety and depression on TBI survivor workload perception of a stress-inducing working memory task.
Participants and Methods: Ten participants with moderate to severe TBI and eight neurologically healthy controls performed the Paced Auditory Serial Addition Task (PASAT). After completing the PASAT, participants reported their subjective workload using the NASA task load index (NASA-TLX). Participants also completed measures of psychological functioning, including the Chicago Multiscale Depression Inventory (CMDI) and the State-Trait Anxiety Inventory (STAI). Relationships between workload and depression and trait anxiety were examined using linear regression.
Results: Linear regression was employed for both the TBI and the healthy control groups to assess the influence of trait anxiety and depression on perceived workload. There was no significant difference between the TBI and

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