

changes in emotional symptoms in adolescents recovering from mTBI and OI in predicting length of recovery, as well as the importance of obtaining separate caregiver report. A more robust understanding of factors contributing to recovery from injury can help inform and improve preventive measures and treatment plans for those at risk or impacted; however, psychological resilience may not uniquely contribute to predicting length of recovery in acutely injured adolescents, limiting value added to the clinical exam. Future studies should explore the relationship between type of injury and recovery time in larger samples.

Categories: Concussion/Mild TBI (Child)

Keyword 1: concussion/ mild traumatic brain injury

Keyword 2: child brain injury

Keyword 3: sports-related neuropsychology

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40 APOE x BDNF Genetic Interaction is Associated with Poorer Cognitive Outcomes in Veterans with Histories of mTBI

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Objective: Many Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) Veterans have sustained a mild traumatic brain injury (mTBI) during their military service and a substantial "miserable minority" frequently report significant cognitive complaints long after injury. Although existing studies have shown associations between genetic factors (e.g., apolipoprotein E [APOE] and brain-derived neurotrophic factor [BDNF]) and cognitive performance in this vulnerable population, the TBI-genetics literature has generally been varied

and inconsistent. Although past findings suggest that individuals who possess APOE $\epsilon 4$ and BDNF Met alleles have worse cognitive outcomes after mTBI, this has not been consistently reported. Additionally, the influence of any gene-by-gene interactions on cognition has not been sufficiently explored and therefore remains a critical area of interest. Thus, we examined relationships between APOE and BDNF genotypes on neuropsychological function in a well-characterized sample of younger Veterans with mTBI histories.

Participants and Methods: Participants included Veterans with a history of mTBI who adequately completed performance validity testing. In total, 78 Veterans (84.6% male; age: $M=32.95$, $SD=7.00$; race/ethnicity: 51.3% White, 28.2% Hispanic/Latino, and 20.5% Another Race/Ethnicity) completed a structured clinical interview to collect detailed information on TBI history and underwent a comprehensive neuropsychological exam. A buccal swab was also collected to determine APOE and BDNF allele status for each participant. Three cognitive composite scores were computed reflecting memory (8 items), attention/processing speed (7 items), and executive functioning (10 items). Two-way analyses of covariance (ANCOVAs) adjusting for age, sex, and race/ethnicity were used to assess the effects of APOE ($\epsilon 4+$ vs. $\epsilon 4-$) and BDNF (Met+ vs. Met-) on cognitive functioning ($\epsilon 4+$ /Met-: $n=12$, $\epsilon 4+$ /Met+: $n=8$, $\epsilon 4-$ /Met-: $n=35$, and $\epsilon 4-$ /Met+: $n=23$).

Results: ANCOVAs revealed no significant main effects for APOE or BDNF genotypes on cognitive functioning; however, there was a significant APOE x BDNF genotype interaction for all three cognitive composites (memory: $p=.026$, $\eta p^2=.068$; attention/processing speed: $p=.045$, $\eta p^2=.055$; and executive functioning: $p=.031$, $\eta p^2=.064$). Specifically, the interaction was such that Veterans in the $\epsilon 4+$ /Met+ group demonstrated the poorest cognitive functioning relative to all other allele group combinations ($\epsilon 4+$ /Met-, $\epsilon 4-$ /Met+, $\epsilon 4-$ /Met-).

Conclusions: The results of this preliminary study demonstrate that, compared to the other genetic subgroups in the TBI sample, Veterans with APOE $\epsilon 4$ and BDNF Met alleles demonstrated the poorest cognitive functioning across several domains known to be negatively affected in the context of head injury (i.e., memory, attention/processing speed, and executive functioning). These findings are the first to show an APOE x BDNF interaction in Veterans with histories of mTBI. Further

research is necessary to replicate and extend this study in larger samples. Moreover, future work should incorporate neuroimaging variables to better interrogate structural and functional correlates of these observed genetic polymorphism associations in Veterans with mTBI histories.

Categories: Concussion/Mild TBI (Adult)

Keyword 1: concussion/ mild traumatic brain injury

Keyword 2: cognitive functioning

Keyword 3: genetics

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41 Predictors of Cognitive Symptoms Following Adult Civilian Mild Traumatic Brain Injury

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Objective: Mild traumatic brain injury (mTBI) is an important public health problem, due to its high incidence and the failure of at least 20% of patients to successfully recover from injury. Cognitive symptoms, in particular, are an important area of research in mTBI, due to their association with return to work and referral to neuropsychological services. Understanding the predictors of cognitive symptoms may help to improve outcomes after mTBI. This study explored female sex, psychological distress, coping style and illness perceptions as potential predictors of cognitive symptoms following adult civilian mTBI.

Participants and Methods: Sixty-nine pre-morbidly healthy adults with mTBI (mean age = 36.7, SD = 14.7, range = 18-60; 15 females) were recruited from trauma wards at two public hospitals in Australia and assessed 6-12 weeks following injury. Cognitive complaint was measured using a comprehensive 30-item scale (CCAMCHI) assessing mTBI-specific symptoms in the domains of processing speed, attention, memory and executive function. Participants

additionally completed the following measures: Brief-COPE, Illness Perceptions Questionnaire-Revised, Inventory of Depressive Symptomatology, Beck Anxiety Inventory, and PTSD Checklist for DSM-5. The latter three measures were combined to create an index of psychological distress.

Results: Bivariate nonparametric correlational analyses indicated that female sex ($r[67] = .26$, 95% CI [.14, .55], $p = .03$) and psychological distress ($r[66] = .54$, 95% CI [.40, .72], $p < .001$) were each significantly associated with cognitive symptom reporting following mTBI. Additionally, while none of the three coping style factors were associated with cognitive symptom reporting, seven of the eight dimensions of illness perceptions were associated with symptom reporting ($|r| = .25 - .58$, $p < 0.05$). In a linear regression model assessing the combined effects of each variable, female sex, greater psychological distress, and overall negative illness perceptions were each significant independent predictors of increased cognitive complaint (adj. $R^2 = .47$, $F[4,63] = 15.59$, $p < .001$).

Conclusions: These findings implicate female sex, psychological distress, and illness perceptions as key factors associated with cognitive symptom reporting after mTBI. This research suggests that these factors may be useful in clinical practice when considering early identification of individuals at risk of poor recovery. Specifically, this research implicates females, individuals with high psychological distress, and individuals with negative illness perceptions as important to subgroups to consider for potential intervention after mTBI. Additionally, as psychological distress and illness perceptions are both potentially modifiable, this research suggests that these factors may be useful targets for intervention.

Categories: Concussion/Mild TBI (Adult)

Keyword 1: concussion/ mild traumatic brain injury

Keyword 2: self-report

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42 Associations Between Mild Traumatic Brain Injury, Executive Function, and