Chronic TBI Outcomes and Treatment Strategies

The Chronic Effects of Neurotrauma Consortium (CENC) Characterizes Chronic TBI and Associated Comorbidities in Service Members and Veterans and Correlates Injury to Long Term Outcomes

The CENC is a joint Department of Defense (DoD) and Department of Veterans Affairs (VA) effort addressing the long-term consequences of mTBI in Service members and Veterans. The CENC is coordinated by researchers at Virginia Commonwealth University (Richmond, VA) and includes collaborators from 57 academic institutions, Veterans Affairs Medical Centers, and Military Treatment Facilities nationwide. The CENC seeks to understand the association (onset, prevalence, and severity) of the chronic effects of mTBI and comorbidities and probe for correlations to neurodegenerative disease.

Recently, CENC has published a synthesis of overarching clinical and cognitive findings from six of its major clinical research studies (*Cifu et al., 2018*). Collectively, these studies included 1,643 Service members and Veterans who served on active duty in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and/or Operation New Dawn (OND); 1,216 of these participants experienced at least one concussive event during their deployment. Clinical assessments including the Patient Health Questionnaire-9 (PHQ-9), Posttraumatic Stress Disorder Checklist (PCL-5), Pittsburgh Sleep Questionnaire Inventory, and several tests of cognitive dysfunction were used among the studies. Mean scores across studies for the PHQ-9 and PCL-5 indicated subclinical levels of psychological distress. Notably, participants reported a greater sleep onset latency and fewer hours of sleep per night than a clinical insomnia sample (*Backhaus et al., 2002*). Mean onset latency ranged 39.8–44.7 minutes in the CENC studies compared to 20.6 minutes in the insomnia study, and mean sleep duration was approximately 5.4 hours in the CENC studies compared to 6.5 hours in the insomnia study. Cognitive evaluations indicated average working memory, processing speed, attention, and executive function.

Other important findings within individual CENC studies include: chronic balance disturbance among those who experienced repeated mTBI events (*Walker et al., 2018*); a significant association of mTBI with Veterans Affairs service-connected disability rating (*Dismuke-Greer et al., 2018*); increased opioid prescribing in Veterans with self-reported severe persistent post-concussive symptoms (*Bertenthal et al., 2018*); increased odds of sensory dysfunction among those with any TBI (*Swan et al., 2018*); reduced functional connectivity of the default mode network with increasing perception of pain among those with mTBI (*Newsome et al., 2018*); and greater levels of exosomal tau and p-tau in those with three or more mTBI than in those with two or fewer mTBI, with higher tau and p-tau levels significantly correlating with posttraumatic and post-concussive symptoms (*Kenney et al., 2018*).

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