Neurocognitive and Psychological Health Outcomes

Laboratory Impulsivity and Depression in Blast-exposed Service Members with Post-Concussion Syndrome

Researchers at the Hunter Holmes McGuire Veterans Affairs Medical Center (Richmond, Virginia) and Virginia Commonwealth University (Richmond, Virginia) conducted a study to investigate the important research question of whether impulsivity increases in Service members whose emotional, cognitive, and somatic symptomatology was ostensibly worsened by exposure to one or more blast events. They assessed a linkage between depression and impaired behavioral inhibition in blast-exposed Service members and Veterans with post-concussion syndrome (PCS). Questionnaire scores of general depression and posttraumatic stress disorder (PTSD) symptomatology were each correlated with commission and perseverative errors in a laboratory probe of impulsivity behaviors. Participants (n =117; 114 males, ages 19–49) included Service members or Veterans who were deployed to Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn; had been exposed to combat; and had experienced close exposure to at least one blast event within the two years prior to enrollment (Table 1). All participants met criteria for PCS. Participants were assessed for post-concussive symptoms, depressive symptomatology, and PTSD symptomatology; they then completed the Conners Continuous Performance Test-II (CPT-II), a laboratory probe of impulsivity. The findings show a correlation between depressive symptoms and CPT-II commission; perseverative errors were significant even after controlling for age and pre-morbid cognitive functioning. In conclusion, these data revealed a modest correlation between depression and motor impulsivity in blast-exposed Service members and Veterans who meet criteria for PCS (*Bjork et al. 2016*).

These data replicate earlier findings that link increased affective symptomatology to impaired behavior inhibition in military traumatic brain injury populations (*James, Strom, and Leskela 2014, Swick et al. 2012*). Further, these data support theories that the increased rates of substance use disorder and suicide attempts among Service members may result from a combination of negative affect and impaired frontocortical behavior control.

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TABLE 1: Characteristics of blast-exposed Service members with PCS. (Table 1 from Bjork et al. (2016) used with permission from authors)

Measure	PCS (n=117) Mean ±SD
Age	26.6 (6.6)
Years education	**13.1 (1.4)**
WTAR estimated IQ (standardized)	**104.1 (12.1)**
CES-D total score	**19.3 (9.3)**
McGill Pain	**12.1 (6.9)**
PCL-5	**50.8 (13.1)**
Rivermead total item score	**33.7 (8.5)**
Blast-attributed symptom (BAS) score (total item score of Rivermead symptoms rated 2+)	**31.3 (9.5)**
Rivermead somatic symptoms rated 2+ (out of possible 9)	**5.1 (1.7)**
Rivermead emotional symptoms rated 2+ (out of possible 4)	**3.2 (1.7)**
Rivermead cognitive symptoms 2+ (out of possible 3)	**2.5 (0.9)**
mTBI diagnosis	**98/117 (83.8%)**
Number of blast exposures	1: n=19 2: n=20 3: n=20 4+: n=58
Interval since most recent of three most severe blast exposures (mo)	11.5 (8.5) range: 3.8–65.3
Interval since most severe blast (mo)	16.8 (15.2) range: 1.0–52.0

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