Neurocognitive and Psychological Health Outcomes

Blast-induced Mild Traumatic Brain Injury and Possible Association with Posttraumatic Stress Disorder

Researchers at the Naval Medical Research Center (Silver Spring, Maryland) have focused on understanding the role of blast-induced mild traumatic brain injury (mTBI) in the development of posttraumatic stress disorder (PTSD). Their efforts were aimed at understanding if and how blast exposure may predispose an individual to PTSD. This was studied using an animal model of blast exposure and introducing behavioral testing to examine the possible effects of blast on fear and anxiety. Both the amygdala and the medial prefrontal cortex areas of the brain were of specific interest, because they have been shown to be associated with PTSD. Findings revealed that although some behavioral changes existed there were no robust behavioral effects. However, corticosterone, a major stress hormone, was significantly elevated in blast-exposed animals. Furthermore, Stathmin-1, a fear-related protein enriched in the amygdala, was found to be elevated in the amygdala of blast exposed rats. Overall there appears to be a relationship of blast exposure and stress-related and fear-related molecular variables. This work indicates the need for more sensitive behavioral measures at different time points to elucidate the relationship of molecular changes and behavior.