Learning to Care for Those in Harm's Way

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CTE 'uncommon' in service member brains, most associated with civilian activities, DoD study finds

Bethesda, Md. – CTE, or chronic traumatic encephalopathy, is uncommon in service members, and is more strongly linked to civilian traumatic brain injuries, according to a study published in the New England Journal of Medicine on June 9 by researchers at the Uniformed Services University of the Health Sciences. The study, "Chronic Traumatic Encephalopathy in the Brains of Military Personnel," was led by Dr. David Priemer, assistant professor of Pathology at USU and neuropathologist for the Henry M. Jackson Foundation for the Advancement of Military Medicine, and Dr. Dan Perl, professor of Pathology and director of the Department of Defense/USU Brain Tissue Repository at USU.

CTE is a brain disease caused by repeated impact head trauma. Scientists have linked this condition with contact sports, particularly football and boxing, and other circumstances of repeated impact head traumas. While it is not yet understood how traumatic brain injuries contribute to the changes in the brain that result in CTE, it is believed that those with CTE develop a range of cognitive, behavioral, mood, and motor issues, later in life. Currently, a diagnosis of CTE can only be made after death at autopsy.

While it is well established that those who play contact sports such as football and boxing are at a high risk for developing CTE, the military experience, including blast exposure, has more recently been implicated as a potential risk factor. The USU team conducted the study to better understand the frequency of CTE among service members, and to determine associations with various traumatic brain injury exposures.

The researchers studied donated brains of 225 deceased active duty and retired service members. They found that only 10 (4.4%) had tracings of CTE –identified by a very distinct and recognizable pattern of pathology in the brain. Of those cases identified with CTE, half showed minimal brain involvement. Also, just three out of 45 in the blast-exposed group were found to have CTE. Of note, all that had CTE also had a history of participation in contact sports, most commonly football and combative sports, with or without an additional history of civilian head injuries unrelated to sports (e.g., car accidents).

Ultimately, the researchers believe this suggests that the current prevalence of CTE in the military community is rather low, and that the risk for CTE is numerically higher for civilian traumatic brain injuries than the general military experience.

"We believe our findings provide some answers surrounding this condition and how it does, or does not, impact our service members," Perl said.

In the specimens that the researchers examined, many of the individuals were relatively young and had passed away only a few years after the time of their blast exposure. As blast-exposed service members age, Priemer said, it's not out of the realm of possibility that they develop related CTE.

"As our service members who have been exposed to blasts age, it remains possible that they may develop CTE or CTE-like pathology, though thus far we have not observed this," Priemer said. "Regardless, our data indicate that CTE currently is not very common among service members and therefore does not seem to be an underlying factor in the large majority of service members who currently suffer persistent neuropsychiatric symptoms following combat exposure."

The DoD/USU repository is the only brain bank facility in the world that is exclusively dedicated to collecting, storing, and analyzing brains of individuals who have served in the military. This study was a collaboration between USU's Center for Neuroscience and Regenerative Medicine and the Henry M. Jackson Foundation for the Advancement of Military Medicine. The study was also funded by the Defense Health Agency.

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