



Higher exosomal phosphorylated tau and total tau among veterans with combat-related repetitive chronic mild traumatic brain injury

Purpose

To measure levels of tau, phosphorylated tau, and amyloid beta in the blood and saliva samples collected from veterans with combat-related mTBIs.

Participants

They (n=195) were combat-deployed veterans who were exposed to mild TBI (mTBI). Recruited from four VA medical centers. They were grouped in positive versus negative mTBI groups, with mTBI sub-grouped according to: 1) loss of consciousness (LOC), post traumatic amnesia (PTA) or alteration of consciousness (AOC); 2) total number of mTBI- repetitive (3 or more mTBI) versus 1-2 mTBI; and 3) blast versus impact mTBI.

How was the study conducted?

Participants' mTBI history was collected through structured interviews and the Ohio State Identification Instrument to categorize lifetime TBI. Neurobehavioral Symptom Inventory as well as the PHQ-9 (questionnaire of depression symptoms) and PCL-5 (questionnaire of post-traumatic stress symptoms) were conducted. Proteins from collected saliva and blood samples (plasma and exosomal- circulating protein containing vesicles) were analyzed. Statistical analyses used were ANOVA with a Welch test, Bonferroni correction for multiple comparisons and a Pearson correlation between protein levels and symptom questionnaires.

Findings

No difference in tau levels among those with mild TBI with LOC or PTA versus those with AOC or no TBI. However, levels were elevated in circulating exosomes in veterans with repetitive TBI (rTBI), and exosomal tau levels correlated with post-traumatic and neurobehavioral symptoms.

Military Impact

In this sample of veterans and service members with mTBIs, there are higher exosomal tau protein levels in those with 3 or more mTBIs compared to those with only 1 or 2 mTBIs and those without any mTBIs.

Kenney, K., Qu, B., Lai, C., Devoto, C., Motamedi, V., Walker, W., Levin, H., Nolen, T., Wilde, E., Diaz-Arrastia, R., & Gill, J. (2018). Higher exosomal phosphorylated tau and total tau among veterans with combat-related repetitive chronic mild traumatic brain injury, Brain Injury, 1-9.