

SSE19-01

Scientific Papers

The Value of 18F-FDG PET/CT in Hypothalamic-Pituitary-Adrenal Axis in Differentiation of Blast-related Mild Traumatic Brain Injury (mTBI) and Post-traumatic Stress Disorder (PTSD) from Blast-related Mild TBI Alone in a Post-acute Veteran Population

Monday, 3:00-3:10 PM

Location: S505AB

PARTICIPANTS:

Osama A Raslan MD, MBBCh (Presenter): Nothing to Disclose

Thomas M Malone BA: Nothing to Disclose

Diane M Whitson MPH: Nothing to Disclose

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CITE THIS ABSTRACT

PURPOSE

Differentiating PTSD from mTBI can be challenging for clinicians due to symptom overlap between conditions. Additionally, many of these patients present with normal structural neuroimaging. It is suspected that the hypothalamic-pituitary-adrenal (HPA) axis plays an important role in PTSD; however, there is limited neuroimaging research that has systematically examined this in the Veteran population. The objective of this study is to evaluate use of FOG PET/CT in differentiating PTSD from mTBI based on metabolic activity in the pituitary and hypothalamic regions.

METHOD AND MATERIALS

We retrospectively reviewed 159 dedicated brain FOG PET/CT studies. All PET images were acquired in the morning and according to standard brain PET/CT protocol. MRI scans of the brain were subsequently done and were interpreted as structurally normal for all subjects by a fellowship-trained neuroradiologist. Cases were divided into 3 groups that were age and gender matched: normal control, TBI, and TBI+PTSD. Patients with TBI were further stratified by severity based on criteria from the Department of Defense and Veterans Affairs Consensus Definition of TBI in 2009. PET/CT scans were read by 2 board certified nuclear medicine physicians blinded to the groups, and a log recorded the SUV max and SUV mean of the pituitary gland and the hypothalamus. Since distributions were approximately normal and sample sizes were sufficiently large, parametric tests were performed (Independent sample t-tests and ANOVA with post hoc comparisons).

RESULTS

The SUVmax from the hypothalamus was significantly lower in TBI-only patients compared to the normal controls (5.78 vs. 6.46 ($p=0.0388$)). When TBI was stratified by severity and limited to military Veterans, the SUVmean in the pituitary was significantly higher in the mild TBI+PTSD group compared to mild TBI-only group (3.08 vs. 2.54 ($p=0.0418$)).

CONCLUSION

SUVmean in the pituitary region is a promising objective tool for differentiating mild TBI+PTSD patients from mild TBI-only patients in a post-acute Veteran population.

CLINICAL RELEVANCE/APPLICATION

PTSD represents an increasing public health issue that is difficult to diagnose. PET/CT activity in pituitary/hypothalamus may provide an objective method to diagnose and differentiate PTSD from mTBI.