PTSDの兵役経験者においてPET/CTにより脳下垂体異常が示された（Abstract SSE19-01）

ハイブリッドPET/CT画像は心的外傷後ストレス障害と軽症の外傷性脳損傷を鑑別する可能性がある

Hybrid PET/CT imaging may differentiate post-traumatic stress disorder from mild traumatic brain injury

脳下垂体領域の陽電子放射断層撮影とコンピュータ断層撮影（PET/CT）のハイブリッド画像は、兵役経験者の心的外傷後ストレス障害（PTSD）と軽症外傷性脳損傷（MTBI）とを鑑別するのに有望な方法であるとのスタディ結果が、2014年Radiological Society of North America年次集会で発表された。研究者らはPET/CTを用いて、爆破によるMTBIを被った兵役経験者の視床下部と脳下垂体を調査した。放射性医薬品フルオロデオキシグルコースの取り込みを計測することにより画像を提供する18F-フルオロデオキシグルコース（18F-FDG）PET/CTに焦点を当てた。159の脳18F-FDG PET/CT検査結果から、視床下部のFDG取り込みはMTBIのみの群において正常なコントロールよりも有意に低下していることが示された。脳下垂体のFDG取り込みはMTBIとPTSDを合併している群においてMTBIのみの群よりも有意に高かった。PTSD患者の脳下垂体におけるFDG取り込み上昇所見は、PTSDと診断された多くの兵役経験者が実際は下垂体機能低下症を有している可能性があるとの見解を支持するものである。これらの結果から、PET/CTはPTSDとMTBIを鑑別診断する有効な手段であり、PTSDの生物学的徴候に関するより多くの知見を提供する可能性のあることが示唆された。

Full Text

Hybrid imaging with positron emission tomography and computed tomography (PET/CT) in the pituitary region of the brain is a promising tool for differentiating military veterans with post-traumatic stress disorder (PTSD) from those with mild traumatic brain injury (MTBI), according to a study presented at the 2014 annual meeting of the Radiological Society of North America (RSNA). The findings also lend support to the theory that many veterans diagnosed with PTSD may actually have hormonal irregularities due to pituitary gland damage from blast injury.

MTBI involves damage to the brain from an external force, while PTSD is generally defined as a mental health condition that can develop after someone has experienced a traumatic event. Research has shown that up to 44 percent of returning veterans with MTBI and loss of consciousness also meet the criteria for PTSD. Differentiating PTSD from MTBI can be challenging for clinicians due to symptom overlap and, in many cases, normal structural neuroimaging results.

Researchers recently used PET/CT to study the hypothalamus and pituitary glands of veterans who had suffered blast-related MTBI. Together with the adrenal glands above each kidney, the hypothalamus and pituitary gland form the HPA axis, an important regulator of many body processes, including stress response, mood and energy expenditure.

"The HPA axis is a complex system with a feedback loop, so that damage to any one of the three areas will affect the others," said study lead author Thomas M. Malone, B.A., from the Department of Neurosurgery at Saint Louis University School of Medicine in Saint Louis. "It's suspected of playing an important role in PTSD, but there is limited neuroimaging research in the veteran population."

The researchers focused on 18F-fluorodeoxyglucose (18F-FDG) PET/CT, which provides a picture of metabolism by measuring uptake of the radiopharmaceutical FDG. A review of 159 brain 18F-FDG PET/CT exam records showed that FDG uptake in the hypothalamus was significantly lower in the MTBI-only group compared with normal controls. FDG uptake in the pituitary gland was significantly higher in the MTBI and PTSD group compared with the MTBI-only group.

The finding of higher FDG uptake in the pituitary glands of PTSD sufferers supports the theory that many veterans diagnosed with PTSD may actually have hypopituitarism, a condition in which the pituitary gland does not produce normal amounts of one or more of its hormones.

"This raises the possibility that some PTSD cases are actually hypopituitarism masking itself as PTSD," Malone said. "If that's the case, then we might be able to help those patients by screening for hormone irregularities and treating those irregularities on an individual basis."

Malone said the increased FDG uptake in the pituitary glands of veterans with MTBI and PTSD may be due to the gland working harder to produce hormones. "It's analogous to having your car stuck in the snow and you keep flooring the gas pedal but you don't go anywhere," Malone said.

The results suggest that PET/CT may provide an effective way to diagnose and differentiate PTSD from MTBI and offer more insight into the biological manifestations of the disorder.

"This study sheds light on the complex issue of PTSD, which also has symptom overlap with depression and anxiety," Malone said. "Currently, treatment for PTSD is typically limited to psychological therapy, antidepressants and anxiety medications. Our findings reinforce the theory that there is something physically and biologically different in veterans who have MTBI and PTSD compared to those who just have MTBI."

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