CTE is confirmed as a unique disease that can be definitively diagnosed

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For the first time, CTE has been confirmed as a unique disease that can be definitively diagnosed by neuropathological examination of brain tissue. A consensus panel of expert neuropathologists concluded that CTE has a pathognomonic signature in the brain, an advance that represents a milestone for CTE research and lays the foundation for future studies defining the clinical symptoms, genetic risk factors and therapeutic strategies for CTE.

The neuropathological criteria defining CTE, or the NINDS CTE criteria, which appear in the journal *Acta Neuropathologica*, had been announced earlier this year at the Foundation of the National Institutes of Health (NIH) board meeting.

CTE is a progressive degenerative disease of the brain found in persons with a history of repetitive brain trauma, including symptomatic concussions as well as asymptomatic sub-concussive hits to the head. The trauma triggers progressive degeneration of the brain tissue, including the build-up of an abnormal protein called tau. These changes in the brain can begin months, years or even decades after the last brain trauma or end of active athletic involvement. The brain degeneration is associated with memory loss, confusion, impaired judgment, impulse control problems, aggression, depression, and, eventually, progressive dementia.

A consensus panel of seven neuropathologists independently reviewed slides from 25 cases of different diseases associated with tau deposits in the brain, completely blinded to all clinical information, including age, sex, clinical symptoms and athletic exposure using provisional diagnostic criteria for CTE developed by Ann McKee, MD, Director of the CTE Program at Boston University and Chief of Neuropathology, VA Boston Healthcare System. The neuropathologists concluded that the criteria distinguished CTE from other tauopathies, including aging and Alzheimer's disease, and that CTE had a unique pathological signature in the brain.

According to McKee, neuropathologists agreed on the diagnosis of CTE and confirmed the interim standards. "The specific feature considered unique to CTE was the abnormal perivascular accumulation of tau in neurons, astrocytes and cell processes in an irregular pattern at the depths of the cortical sulci," explained McKee who is corresponding author of the study. "This lesion was not characteristic of any of the other disorders, including Alzheimer's disease, age-related tauopathy or progressive supranuclear palsy, and has only been found in individuals who were exposed to brain trauma, typically multiple episodes," she added.

More information: Ann C. McKee et al. The first NINDS/NIBIB consensus meeting to define neuropathological criteria for the diagnosis of chronic traumatic encephalopathy, *Acta Neuropathologica* (2015). DOI: 10.1007/s00401-015-1515-z

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