

# 'Insufficient evidence' on degenerative brain disease in athletes

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Available research does not support the contention that athletes are uniquely at risk of chronic traumatic encephalopathy (CTE) or other neurodegenerative disorders, according to a review in the June issue of *Neurosurgery*, official journal of the Congress of Neurological Surgeons.

Widely reported and publicized cases of CTE in retired [athletes](#) overlap with other neurodegenerative disorders, while the observed symptoms could result from a wide range of other factors, suggests the review by Dr. Gavin A. Davis of Cabrini Medical Centre in Malvern, Victoria, Australia, and colleagues. They write, "[We] think there is insufficient evidence to establish a causal relationship between sports participation and the existence of modern CTE."

## Experts Question Link between CTE and Sports

Over the past decade, a series of reports have described CTE as specific [neurodegenerative disorder](#) occurring in football players and other athletes. "Typically, sport-related CTE occurs in a retired athlete with or without a history of concussion(s) who presents with a constellation of cognitive, mood, and/or behavioral symptoms," according to Dr. Davis and coauthors.

Those reports have linked CTE to a history of concussions and "subconcussive impacts" during the athlete's playing career. However, because of the limitations of case series analysis, no direct causal link

between concussion and CTE has been established.

Autopsy studies of athletes with CTE emphasize the presence of a protein called tau in specific areas of the brain. However, Dr. Davis and colleagues note that similar patterns of tau deposits are found in Alzheimer's disease and other common neurodegenerative disorders. These include the behavioral forms of frontotemporal dementia—the symptoms of which are "almost identical" to those of CTE.

The authors also note that a wide range of other factors can contribute to brain tau deposits, including genetic mutations, various drugs and toxins, environmental factors, and even normal aging. These factors can lead to conditions similar to CTE in people who are not athletes.

For example, tau deposits have been linked to substance abuse, including strong opiate pain medications—which are widely used by athletes. "It is likely that many of the cases with neuropathological findings represent the normal aging process, the effects of opiate abuse, or a variant of frontotemporal degeneration," Dr. Davis and coauthors write. They believe that in some cases, the clinical features may reflect depression or other mental health issues.

At a time of intense focus on the possible health effects of concussion and [sports participation](#), Dr. Davis and coauthors hope their findings will draw attention to the limitations of the current evidence on CTE. They write, "When a previously undescribed condition, such as modern CTE in retired athletes, is proposed based on neuropathological findings in a small and potentially biased sample, then the complex genetic and environmental variables as well as the normal range of age-related brain degeneration implore us to cautiously review the data related to putative CTE."

**More information:** "Neurodegeneration and Sport" [DOI:](#)

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