



The Hidden Toll: CTE and Football Participation

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Why I Chose CTE

I chose to research Chronic Traumatic Encephalopathy (CTE) because I am interested in many sports, and I realize how many head injuries can arise from them. I am also applying to physical therapy schools and will learn more about neurology. All this made CTE very interesting to research more about.

What is CTE?

CTE is a neurodegenerative disease. It results from repeated head trauma or concussions (1). The past 15 years has seen a rise in research studies examining this phenomenon. This corresponds with the increased attention being brought to the public of high-profile cases in the National Football League (NFL), such as Junior Seau from the Los Angeles Chargers and Frank Gifford, former NFL player and sports commentator. Currently, CTE can only be diagnosed posthumously when the brains of the deceased get autopsied. CTE has four stages (2), and the typical symptoms of each stage are provided in Table 1.

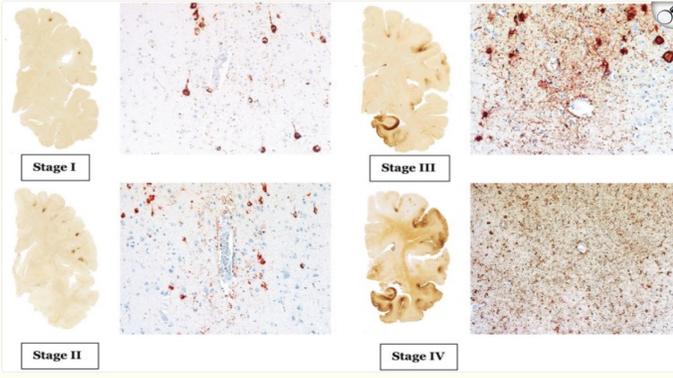


Figure 1 (2)

Long-Term Effects

While disease progression is often slow (see Figure 1), it can eventually lead to progressive brain diseases, such as dementia, Alzheimer’s disease, and Parkinson’s disease (3-4). These long-term consequences have a notable influence on quality of life. For example, a study completed by Harvard reported that the average age at death of NFL players who died between 1979-2013 was just 59.6 years (5). While this number represents the quantity of life, concerningly, another study reported suicidality in 171 of 681 participants who had perceived CTE (6). This included participants who played between 1960-2020.

Why this Matters

Youth football participation rates in the United States for children ages 6-12 declined by 13% from 2019 to 2022 (7), likely due to growing concerns over the long-term effects of repeated head impacts. Adding to these concerns, a class action lawsuit was filed against the NFL, alleging that the league not only failed to adequately address head injuries but also actively concealed evidence of their dangers (8).

The Future of CTE

Since CTE can only be diagnosed posthumously, current research has largely focused more on identifying biomarkers and understanding the underlying mechanisms that causes the disease (10). While ways to mitigate concussion risk have been implemented by the NFL (e.g., Guardian Caps), the inherent risk of participant in collision sports such as football remains. As such, future studies would benefit from focusing on better ways to reduce concussion incidence and improve treatment, particularly in younger athletes.

Table 1

Diagnostic subgroups	Definition
Stage I	• Asymptomatic, or mild memory and depressive symptoms.
Stage II	• Symptoms include behavioral outbursts and severe depression
Stage III	• Cognitive deficits including memory loss and executive dysfunction
Stage IV	• Advance language deficits, psychotic symptoms, profound cognitive deficits, and motor features.

Conclusion

In conclusion, greater resources should be dedicated to minimizing head trauma in football. Repeated concussions often present both immediate symptoms and long-term consequences, making it a critical issue for player safety. While public awareness of the dangers has grown, it is essential that we take action to make football safer for athletes at all levels, prioritizing long-term health and the well-being of players.

References:

