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Understanding chronic traumatic encephalopathy

What is chronic traumatic encephalopathy (CTE)?

Chronic traumatic encephalopathy (CTE) is a type of neurodegenerative disease associated with repeated head injuries, concussions or subconcussions. It was first identified in boxers in the 1920s, and more recently has been discussed in relation to other contact sports such as rugby.

Like other types of neurodegenerative diseases, CTE causes a wide range of symptoms, often relating to thinking, mood and behaviour. However, symptoms can begin much earlier than a disease like Alzheimer's disease. Cognitive and behavioural (mental health) symptoms might begin in a person's 20s or 30s. Comparatively, Alzheimer's disease might not be symptomatic until your 80s.

Symptoms

Chronic traumatic encephalopathy affects individuals differently, but there are common symptoms that many people experience. These symptoms often develop years or even decades after the initial head injuries and can progress over time.

- **Cognitive symptoms**; i.e. Memory loss, executive dysfunction, attention & concentration difficulties.
- **Behavioural symptoms**; i.e. Explosivity, physical or verbal violence, impulse control problems.
- **Mood-related symptoms**; i.e. Sadness/depression, suicidal ideation or attempts, substance abuse.
- **Motor symptoms**; i.e. Tremors, impaired balance or coordination, abnormal gait.
- **Related movement disorders**. Some people develop motor neurone disease (MND) or Parkinson's disease in association with CTE.

Causes

Chronic traumatic encephalopathy is not fully understood, but research has established a clear link between repetitive concussive or subconcussive blows to the head and CTE.

When the brain experiences a trauma, it can cause a build-up of a protein called tau. Tau is a protein that, in its normal form, helps to stabilise the structure of nerve cells (neurons) in the brain. However, in CTE, tau becomes abnormally folded and forms clumps inside neurons, leading to cell death and brain atrophy (shrinkage).

Treatment

Currently, there is no specific treatment or cure for CTE. Researchers instead focus on preventive measures, such as finding ways to reduce head injuries. In contact sports this might involve educating coaches, players and parents about the risks, ensuring that field medics know the signs of concussion, and penalising players for dangerous moves.

However, once a person has developed symptoms of CTE, treatment is focused on symptom management and strategies to improve the person's quality of life. Some approaches include medication, physical therapy, occupational therapy, and cognitive rehabilitation.

Outlook

The prognosis for chronic traumatic encephalopathy varies from person to person and depends on several factors including the severity of the disease, the age at which symptoms first appear, and the presence of other medical conditions. In general, CTE is a progressive disease that tends to worsen over time. However, the rate of progression and the severity of symptoms can vary widely among individuals.

Learn more at https://brainfoundation.org.au/disorders/chronic-traumatic-encephalopathy/