

Players' Brain Study Finds Two Main Symptom Patterns

Lindsey Tanner, AP Medical Writer

Early signs of a destructive brain disease linked with head blows might include mood changes in younger athletes and mental decline at older ages, a small study of deceased former players suggests.

The researchers think the disease could involve two distinct patterns of symptoms, although the study doesn't prove that the behavior reported by families was caused by the brain disease, which was found after the athletes died.

The study is the largest report on a series of cases involving autopsy-confirmed chronic traumatic encephalopathy, or CTE, said lead author Robert Stern, a neurology professor at Boston University's medical school. It involved 36 former athletes — mostly professional football players — who'd experienced repeated head blows. Their brains were donated for research by their families.

The results were published online Wednesday in the journal *Neurology*. Results were based on brain imaging after death, medical records and family interviews. Players involved were all men, aged 17 to 98. Six died from suicide.

In younger players, mood and behavior changes, including depression and explosive tempers, began appearing at an average age of 35, long before mental decline. But in older players, mental decline, starting around age 59, was the first symptom.

Overall, 22 players first developed mood or behavior changes and 11 initially had memory problems or other mental decline. Three players had no symptoms.

The results echo research in former boxers with "punch drunk" symptoms, but that evidence didn't include brain imaging, Stern said.

He said he hopes the study will help lead to ways of diagnosing CTE before death and treating the disease.

The researchers acknowledged the study's limitations, including the small size and lack of a comparison group of former players without the disease. Larger studies might reveal other distinct patterns of symptoms, they said.

Little is known about CTE and its causes, but repeated head injuries including concussions are thought to be a risk factor. The disease process is thought to begin long before symptoms appear and involves an increasing buildup of abnormal proteins in the brain.

But Stern said, "there's no way to ever make a link directly between symptoms" and

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brain disease found after death.

Dr. Jeffrey Kutcher, director of a University of Michigan sports neurology program, echoed that comment and said the study athletes' symptoms could have been caused by something other than CTE, including depression, medication use, sleep deprivation, or normal aging.

Several former NFL stars have been diagnosed with the disease after death in recent years, including Junior Seau, Dave Duerson and Ray Easterling, who all had troubling symptoms and committed suicide.

Thousands of former players have sued the NFL, claiming the league withheld information about damaging effects of repeated head blows and concussions.

"The bottom line is, there's very little direct evidence of chronic effects of head trauma," Kutcher said. "As a neurologist, I know that brains don't like to experience" repeated head blows. "On the other side, I know that the majority of people who experience these forces do not have life-altering clinical outcomes."

A recent National Institutes of Health report said big questions remain for CTE research, including how prevalent it is; do genes make some people more vulnerable to it and how can it be diagnosed before death.

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