Youth Sport Injuries May Lead to Adult Brain Disease

Concussions in Youth May Lead to Accumulated Brain Damage

By LIZ NEPORENT

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The degenerative brain disease being blamed for suicides and mental illness in pro athletes may have started when they were young athletic children and absorbing knocks in grade school and high school, experts say.

The theory also suggests that many people who are not elite athletes playing contact sports, but did play sports as children, may be at risk for developing chronic traumatic encephalopathy, or CTE.

"We don't know what the age of onset is with any of these cases," said Chris Nowinski, the co-director of the Boston University Center for the Study of Traumatic Encephalopathy. "There is reason to believe it can begin when a child is very young."

The latest discussion of CTE arose after former Major League Baseball player Ryan Freel, who committed suicide at the age of 36, was diagnosed to have had the disease. CTE had not been associated with baseball players. Instead it is linked to the public's perception of more violent sports like football, ice hockey and boxing.

Nowinski's colleague, Dr. Ann McKee, has dissected and studied more than 180 brains of athletes. Over 100 have been found to have CTE pathology.

Nowinski noted that Freel had a well documented history of blows to the head and concussions starting in childhood when he played youth football.

Rough hits, hard knocks and head butts begin early on in any athletic career when kids join sports teams and youth leagues. A recent report from the Institute of Medicine and National Research Council found more than 250,000 athletes under the age of 19 were treated in U.S. emergency departments for concussions and other brain injuries in 2009. College athletes have twice the risk of concussion compared to high school athletes.

Nowinski said getting beamed on the head with a baseball or a falling off a balance beam might be just as dangerous in contracting CTE as helmet to helmet contact in a football game.

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Nowinski noted that the youngest CTE brain the study had examined belonged to a 17 year old. But he suspected that the degenerative process may have started even younger.

Part of the difficulty in pinpointing the timing of CTE is that it can only be diagnosed posthumously by
dissecting and scanning the brain. Significant head trauma seems to trigger a progressive degeneration of the brain tissue, including the build-up of an abnormal protein called tau. People with the condition experienced memory loss, confusion, impaired judgment, impulse control problems, aggression, depression, and, eventually, progressive dementia.

The changes, both neurological and behavioral, can begin months, years, or even decades after the last brain injury, Nowinski explained.

Further complicating matters, brains suspected of early stage CTE may show only tiny spots of injury that must be identified under the microscope. It's difficult to say whether the behavioral changes seen in life can be attributed to brain abnormalities, Nowinski said. There isn't enough conclusive evidence directly linking concussions to suicidal thoughts and abnormal behavior.

One of the holy grails of brain research is to find a way to diagnose and treat CTE while a person is still alive, possibly soon after being diagnosed with a brain injury, said Dr. Walter Koroshetz, the deputy director of the National Institute of Neurological Disorders and Stroke. Right now there are no brain imaging techniques sophisticated enough to spot the subtle brain changes as the disease begins to form, though some PET scan techniques used to diagnose Alzheimer's and other forms of dementia show promise, he said.

And because so little is known about the brain's risk and vulnerability to CTE, Nowinski said parents should do everything they can to prevent their kids from getting a concussion during sports and play.

Safe play starts with a good fitting helmet, he said, but there's no strong evidence they offer as much protection from concussions as parents might assume. The best way to manage head injuries is to ensure coaches and kids play safely and know how to spot the signs and symptoms of concussion.

"If you suspect your child has sustained a concussion, don't let it go. Seek medical attention," Nowinski said. "You can lower the risks with proper diagnosis and treatment."

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