Head Injuries and Sports:

An Interview With Bennet Omalu, MD

Bennet Omalu, MD

By Michael Dregni

These days, Bennet Omalu, MD, is known as the man who singlehandedly took on the NFL over the issue of head injuries. His campaign to publicize the plight of former football players who died from cumulative knocks to the head put the league on the defensive. The NFL fought back, trying to discredit Omalu and downplay the brain disease he discovered, CTE, or chronic traumatic encephalopathy. His story was told in the 2015 film *Concussion*, where he was played by Will Smith.

In 2002, Omalu was working as a forensic pathologist in the county coroner's office in Pittsburgh, Pa., when he did an autopsy of all-star pro football player "Iron Mike" Webster. Omalu determined that Webster's brain had been injured by the cumulative effect of numerous *subconcussive* head injuries he suffered over his 17 seasons in the NFL.

From 2004 through 2008, Omalu did autopsies of NFL players, wrestlers, and military veterans including, but not limited to, Terry Long, Justin Strzelczyk, Andre Waters, Chris Benoit and Tom McHale, and determined CTE to be an underlying cause or contributory factor to the death of these athletes and military veterans.

Today, Omalu is the chief medical examiner for California's San Joaquin County as well as a clinical professor of pathology and laboratory medicine at University of California, Davis. He explained details of CTE — and discussed his views on allowing children to play football.

Q&A

***Experience Life*: Can you please define chronic traumatic encephalopathy for the lay reader?**

Bennet Omalu: Chronic Traumatic Encephalopathy, or CTE, is a major part of the traumatic encephalopathy syndromes, which arise when the human brain suffers blunt force trauma or acceleration–deceleration injuries. It is a type of brain damage, which can be permanent and progressive, and can be caused by repeated blows to the head over time in all types of human activities including sports. Single or episodic blows to the head like we have in motor-vehicle crashes, which result in severe brain injuries, can also cause CTE.

CTE manifests with a broad spectrum of symptoms, which may include but are not limited to mood disorders like depression, bipolar disorder, impulsivity, drug and alcohol abuse, loss of memory, loss of intelligence and language, loss of executive thinking, and other cognitive capacities.

***EL*: We often hear the generalized statement that "concussions cause CTE." But, from my understanding, CTE is caused by cumulative blows to the head — correct? And these blows can be both minor and major, from subconcussions to true concussions.**

BO: Yes, CTE is not caused by concussions. Subconcussions and concussions are diseases by themselves, which are separate from CTE. Subconcussions and concussions belong to the acute traumatic encephalopathy syndromes. You can develop CTE without suffering a concussion.

CTE can be caused by a single blow to the head, episodic blows to the head, or repetitive blows to the head, with or without concussions, with or without helmets.

There is nothing like a safe blow to the head. In all that we do, we should avoid blows to the head.

***EL*: Do you think we will someday be able to diagnose CTE in living people?**

BO: Yes, today, we can diagnose CTE in living people based on the manifesting symptoms and a history of exposure, but it will be a presumptive diagnosis, just like we do for other types of dementias. Definitive diagnosis remains with postmortem examination of the brain, just like for other dementias. However, we do not need a definitive degree of certainty to make a diagnosis in a living person.

So yes, we can now diagnose CTE in living people. But in the near future we can develop biological and radiological markers for CTE, which will be clinical-assessment tools that will aid the physician in a more definitive diagnosis of CTE in a living patient.

> **"We must protect our children from all types of intentional exposure to the risk of brain injury."**

***EL*: And someday will we have a treatment, or even cure, for it?**

BO: Yes, someday, I believe, we may develop a more definitive treatment modality for CTE, which can slow down the progression of the disease, or reduce the probability of suffering from the disease. I believe pharmacological agents will be more promising than technological devices.

***EL*: Knowing what we know now about repeated blows to the head, should children expose themselves to activities that could damage their brains, like football, hockey, or boxing?**

BO: No child under the age of 18 — which is when the brain becomes fully developed — should be allowed to participate in high-impact, high-contact sports, including boxing, American football, ice hockey, wrestling, mixed martial arts, and rugby. Children cannot join the military or vote, or drive a car, or sky-dive until they are 18.

For the less-contact, less-impact sports like soccer, we should take heading the ball out of the game for children under the age of 18, and children should not play soccer as we play it today until they are about 12 to 14 years old, when they have developed the motor and visuo-spatial neurological capacities that are required for complex, less-contact, less-impact sports like soccer and lacrosse. Children should engage in noncontact sports like track and field, basketball, volleyball, badminton, lawn tennis, swimming, table tennis, etc.

Knowing what we know now, we must protect our children from all types of intentional exposure to the risk of brain injury. High-impact, high-contact sports possess extremely high risks of brain injury. We should keep our children away from such risks.