Are NHL enforcers' addictions, depression a result of on-ice brain trauma?

A Q&A with neurosurgeon Robert Cantu who studies the brains of dead athletes

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The deaths of NHL enforcers Derek Boogaard, Rick Rypien and Wade Belak during the past four months are raising questions whether there is some link that explains those tragic events. (Bruce Bennett/Getty Images, David Zalubowski/Associated Press, Mark Humphrey/Associated Press)

Beginning of Story Content

Neurosurgeon Robert Cantu and his team at Boston University study the brains of deceased athletes. They have already examined the brains of Reggie Fleming, an enforcer in the '60s, and Bob Probert, an enforcer who retired in 2002 after 16 NHL seasons and died in July 2010 of a heart attack.

Cantu and his research team Ann McKee, Robert Stern and Chris Nowinski found that both Fleming and Probert had chronic traumatic encephalopathy (CTE), a degenerative brain disease caused by blunt impact to the head.The researchers also examined the brain of Dave Duerson, a former National Football Leaguye player who committed suicide in February. Duerson also had CTE.

The brains were studied at the Centre for the Study of Traumatic Encephalopathy, a collaboration between Boston University Medical School and the Sports Legacy Institute, which was co-founded by Cantu.

In the interview, Cantu explains that addiction, depression and anxiety may result from CTE.

In the last four months, three National Hockey League enforcers have died tragically. In May, Derek Boogaard died from a combination of too many painkillers and alcohol. Rick Rypien, was

found dead in his home in Alberta on Aug.15, an apparent suicide, and, most recently, Wade Belak was found dead in a Toronto hotel on Aug. 31.

On Friday Lorraine Belak, Wade's mother, confirmed to CBC that her son suffered from depression. Rypien also dealt with depression.

Cantu and his team have examined Derek Boogaard's brain but the results are not yet public.

CBC News: What is it about NHL enforcers that could possibly explain the recent deaths of Derek Boogaard, Rick Rypien and Wade Belak?

Robert Cantu: We've studied several deceased NHL players who were enforcers and the two that we brought public so far — Reggie Fleming and Bob Probert — both died with chronic traumatic encephalopathy.

Dr. Robert Cantu explained to CBC News that because of their role, NHL enforcers are likely to have suffered concussions, which can lead to the brain disease CTE.

Vernon Doucette/Boston University Photography

We have also had a number of brains come to us, mostly from NFL players who committed suicide, and their brains have shown chronic traumatic encephalopathy.

So anytime I hear of an athlete who has had a lot of head trauma who commits suicide, I am immediately concerned that chronic traumatic encephalopathy may have played a role. And I would like to study their brain to see whether the presence of chronic traumatic encephalopathy is there.

What is it that happens to a brain that suffers, perhaps repeated, damage from concussion or hard blows?

The ultimate hallmark of CTE is the abnormal hyper-phosphorylated tau protein deposit that can be stained for and identified. Tau is throughout the brain, though it is in particular locations in greater concentrations.

The medial temporal lobe is the area of highest concentration. That medial temporal lobe has functions of:

- memory,
- impulse control,
- addiction,
- emotions,
- depression
- and anxiety.

So when that area of the brain is damaged, you have problems in those areas and that's what we see with CTE.

Looking at the brains you've examined, of athletes that have died, why would CTE be a factor in a suicide?

Because the difficulty handling impulses and the difficulty with emotions, especially depressive emotions, are impaired with CTE. That's why depression is very common with CTE.

George Laraque, the Montreal Canadiens tough guy spoke about the enforcer role in a CBC interview Thursday. He said that a lot of enforcers find the pressure tough to deal with and so use drugs and alcohol to cope, and develop problems as a result. What are your thoughts on that?

The medial temporal lobe, as I said, is associated with addictive behaviours and alcohol and drug abuse are addictions. So it is very consistent. And we find that addictions are very common in people with CTE and we find that some of the brains that come our way, came our way not because of a conscious suicide but because somebody was involved with drugs and/or alcohol and the combination became lethal.

So it could be an accidental combination, or driving while impaired, that sort of thing?

Yes.

What about the pattern, are enforcers more or less likely to suffer from concussions?

Derek Boogaard's death on May 13 was ruled accidental, the result of a toxic mix of alcohol and the powerful pain killer oxycodone. Boogaard, right, fights Jody Shelley at a Nov. 4, 2010 hockey game in Philadelphia.

Matt Slocum/Associated Press

I have seen a number of enforcers in my practice. They tell me that about one out of every four or five times that they fight they suffer what sounds to me like a concussion, meaning they get stunned or they have other post-concussion symptoms.

And they tell me they go to the penalty box and they never tell the training staff they've had a concussion. And they don't complain of their symptoms because they are afraid if they do they will be replaced, their job will be lost.

How common are athlete suicides?

I don't think we have a real good handle on that. There is evidence to suggest that it is less common than it is in non-athletes at the high-school level, that playing sports improves one's self esteem and gives a better chance not to have depression overtake them. Some high school athletes commit suicide, so it's not an absolute protection. We don't have a good handle.

Do you have a better handle with professional athletes?

 *According to Dr. Cantu, addictions and depression are very common in people with CTE. Vernon Doucette/Boston University Photography*No, except that we're beginning to keep closer score, if you know what I mean, and we don't like what we're finding.

We've not had a good data system for recording athletic suicides. It's something that really is needed.

In addition to the data set on athlete suicides, what else should be done to reduce the number of athlete suicides?

Just like there's concussion education mandated by the new legislation in many U.S. states, that education should include a bit about, if you have depression or overwhelming sadness, that you seek help. There are suicide hotlines and crisis control situations available to people.

In other words, we don't ever want to study another brain that came to us by way of suicide.

Will we study them? Of course, but we do not want them to come to us because of that!