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The Impact Spectrum of Head Injuries on the Sport of Hockey

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The Impact Spectrum of Head Injuries on the Sport of Hockey

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Introduction

The Center for Disease Control and Prevention (CDC) estimates there are between 1.6-3.8 million sports and recreation related concussions per year. A concussion is defined as a serious brain injury caused by the rapid movement (linear front-toback, side-to-side) or rotational (angular) movement of the brain inside the skull, which results in damage and disruption to the brain cell function, causing brain trauma. The sport with the highest incidence of concussions is actually biking, among team sports the highest are football and hockey. Concussions are looked at as a "silent epidemic" not only in the National Hockey League (NHL), but also in the entire hockey community. The neuropathology of multiple deceased NFL players, NHL players, and boxers show an accumulation of Tau proteins, which is now referred to as Chronic Traumatic Encephalopathy (CTE). As players get bigger, stronger, and faster the incidence of concussions in hockey is likely to continue to rise. An important way to combat this is through educational programs in youth hockey.

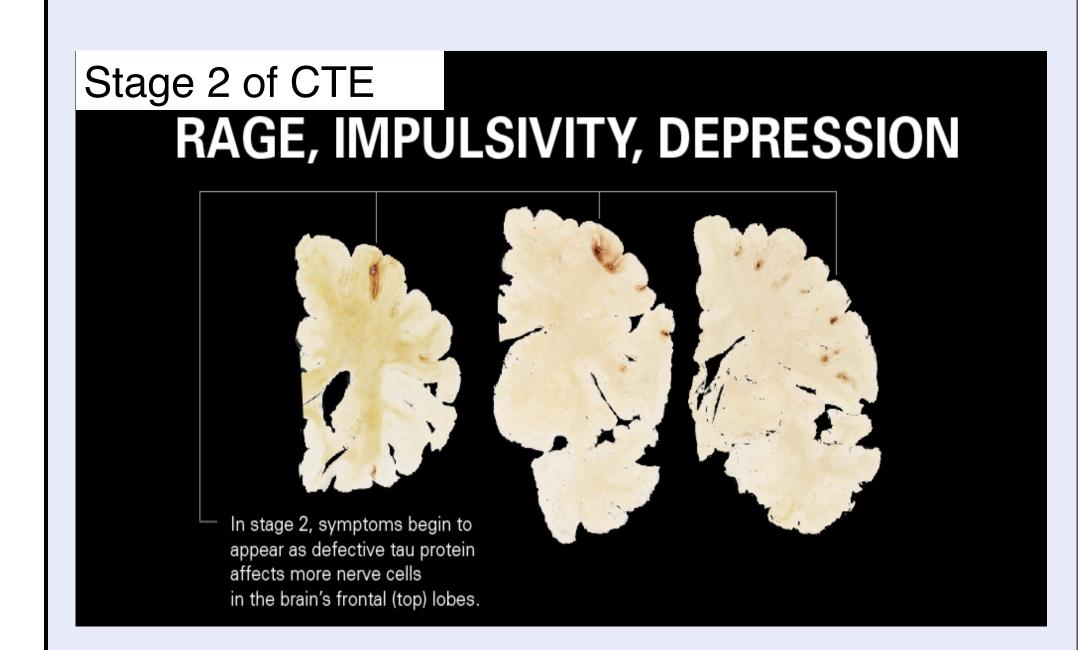
Materials and methods

For this literature review, various academic sources were used to find medical journal articles and other sources on concussions. After researching the science of concussions, the next part of the research was dedicated to looking at the incidence of head injuries in the hockey. This included looking up rules, hockey equipment, and the mechanisms of concussion in the sport of hockey. Finally after looking at head injuries in hockey, the last part of the research for this review centered around long-term effects of concussions. There was a specific focus on incidence of depression, suicide, and Chronic Traumatic Encephalopathy in retired athletes. The main focus of this literature review was to look at the relationship between hockey and head injuries.

Results

The sport with the highest incidence of concussions is biking, but the highest team sports are football and hockey. Literature shows concussions result in a wide range of graded cognitive, somatic, and neurological symptoms, with the most reported symptom being headaches. More than 90% of Sportsrelated Concussions (SRCs) result in no observable loss of consciousness (LOC) or posttraumatic amnesia (PTA). Every concussion sustained increases the likelihood that the athlete will sustain another concussion. As of now, there is no specific treatment for concussions, other than rest until the patient is completely asymptomatic.

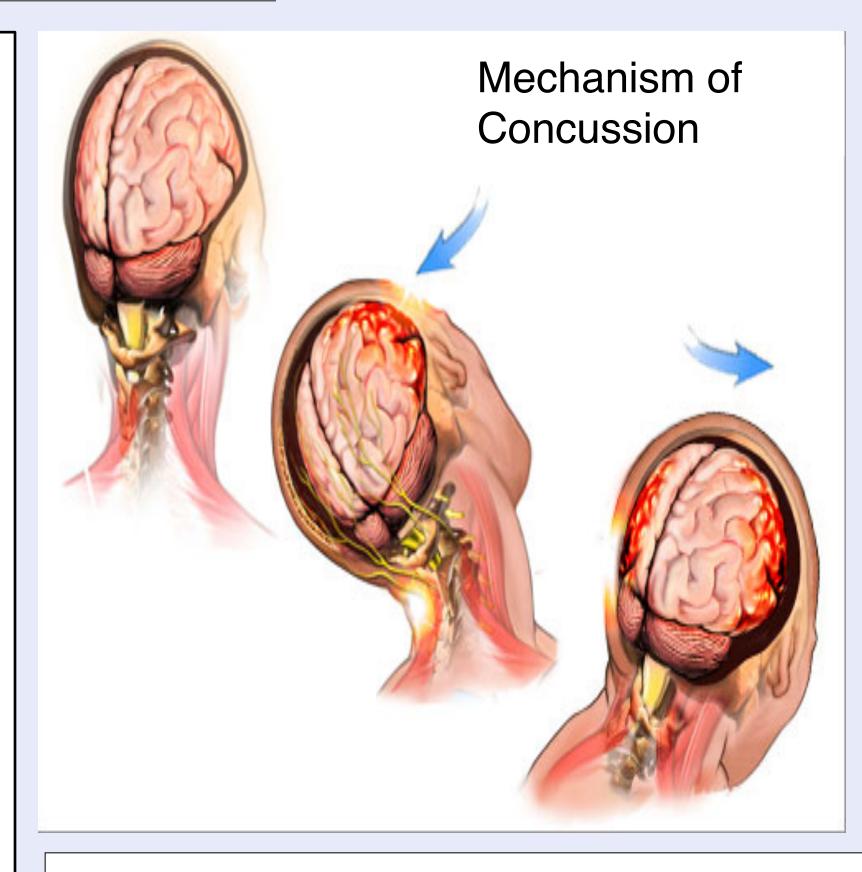
The rate of concussions observed in the NHL has been reported at 3.1% per game, and the incidence of concussions has steadily risen from 2009 until now. Body checking is the main mechanism of injury in hockey, where impacts are most likely to occur from contact with another body part or object. Rule 48, which was established to eliminate checks that target the head, was implemented in the NHL during the 2010-2011 season. After its implementation, body checking with head contact only made up 31.7% of concussions from 2009-2012, which is half of what it was from 2006-2010 (62.1%). Fighting is only responsible for about 9% of all concussions in the NHL. There is no real research that indicates that fighting needs to be removed from the NHL, as fighting is in part used to mediate aggressive play.



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Concussions have been proven to play a role in starting or catalyzing the neurological cascade leading to negative long-term neurological and neurodegenerative issues. Depression is the most stated psychological disturbance after suffering a Traumatic Brain Injury (TBI); with prevalence rates from 6% in mild TBIs to 77% in more severe TBIs within the first year of the injury. Studies done by the NFL show that there is a large increase in the number of suicides in retired NFL players (and other contact athletes) compared to the rest of the population. The neuropathology of multiple deceased NFL players, NHL players, and boxers show an accumulation of Tau proteins, which is now referred to as Chronic Traumatic Encephalopathy (CTE). Symptoms of CTE usually present themselves in the middle of life and worsen overtime, resulting from progressive decline (and eventually death) in the function of the neurons. Severe TBIs can cause CTE, but so can asymptomatic subconcussive blows, blast waves, minimal gravitational force, and degree of axonal injury and/or micro-hemorrhages.

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Conclusions

As players get bigger, stronger, and faster the incidence of concussions in hockey is likely to continue to rise barring any rule changes. The NHL and its commissioner Gary Bettman continue to deny the link between hockey and head trauma as well as the link between head trauma and CTE. The NHL still refuses to fund concussion research, even though the NFL continues to do so. Moreover, the NFL just lost a one billion dollar concussion lawsuit to former players and their families. Subsequent to this lawsuit, the NFL finally admitted the link between football, head injuries, and neurodegenerative diseases such as CTE. After highly publicized suicides by professional athletes (NFL and NHL) shown to have CTE, there has been an increase in research to understand the link between multiple concussions, CTE, and suicide. With the continuous flow of literature coming out about concussions and their long term effects, the NHL shouldn't be far behind in the NFL in admitting the link between contact sports, head injuries, and long-term degenerative brain disorders. This new research needs to be combined with the rulebook of the NHL to help develop new rules that will help to protect players from forces that will cause concussions.



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