Student Name

Professor

Course

Date

Causes and Prevention of Chronic Traumatic Encephalopathy (CTE) in American Football

The mental health of an individual is determined by a wide array of factors, including but not limited to the genetic factors and daily activities that an individual engages in. Essentially, deteriorating mental health results in the inability of an individual to take care of oneself; this leads to an increased burden of care to the caregivers. One of the devastating effects of poor mental health is deteriorated cognitive abilities that thwart an individual’s line of thought and memories. Various researchers have found concussion to cause mental health issues and contribute to the exacerbation of various mental health conditions. In line with this, the American football has been found to contribute vastly to the reported cases of Chronic Traumatic Encephalopathy (CTE), with a significant number of players suffering from CTE either during or after years of active participation in NFL.

The American football is not just a regular sport that entails constant contact with other players; it is fundamentally a dangerous sport that entails high rates of body collision and significant concussions. While these collisions and concussions are observable to the general populations, the football fans, the medical community, and the NFL have taken excessively long to come up with a feasible solution to this problem, which greatly contributes to CTE among the players. Ward et al. explain that CTE is a mental health condition in which the brain’s health status deteriorates as a result of severe blows on the head or persistent concussions (Ward et al.).

From a biological perspective, Viano et al. explain that the human brain is held within the skull by the cerebrospinal fluid and arachnoid trabeculae; hence, it is not rigidly attached to the skull for normal functioning to occur (Viano 894). Thus, any activity that is associated with movement in one way or the other affects how well the brain functions. The fact that the brain is usually freely floating within the skull implies that at any single instance, it exhibits a slower response to a movement of the skull, more so abrupt movements that can be caused by a blow during the American football game. In American football, blows are quite many and capable of causing coupe and countercoup brain injuries, which result in frequent brain destabilization. Drew and William define coup injury as “the contusion to the brain that occurs at the area of brain adjacent to the location at which the skull impacts with a fixed external object” and the countercoup injury as “the contusion to the brain that occurs at the area of the brain opposite the area of skull impact” (Drew and William 385). Depending on the intensity of the concussion suffered, a wide array of neurologic dysfunctions may be witnessed by an individual as a result of the coup and countercoup injuries.

Research by Langlois indicates that approximately 1.4 million people in the U. S die as a result of various mental conditions associated with traumatic brain injuries; hence, there is the need for better care and rehabilitation of the patients suffering from the conditions (Langlois 13). While this figure may appear to be high, Langlois posits that this number is not representative of all the cases reported, as, in some instances, individuals suffering from moderate or mild traumatic brain injuries seldom seek medical attention (Langlois 13). While traumatic brain injuries may emanate from one-time high impact injury to the head or other body organs that affect the functioning of the brain, the latter may as well emanate from numerous minor impacts to the head. Research by Ward et al. on CTE found out that out of 202 brains of deceased NFL players studied, 110 suffered from CTE, which in turn impaired their cognitive functioning (Ward et al.). While the study entailed a significant sampling bias as it only enlisted the brains of the deceased NFL players whose families requested brain analysis to identify the cause of death, the statistics are sufficiently significant to trigger an alarm, as they indicated that the NFL players were at a higher risk of developing the condition.

According to Herington et al., concussions, which are believed to be the major cause of the CTEs in NFL players, are associated with “short-lived neurological impairment,” “functional disturbance,” and possible “loss of consciousness” (Herring et al. 395). These concussions, as attested by McKee et al. are usually as a result of indirect or direct blows to the head, neck or spinal cord in a manner that causes Amyotrophic Lateral Sclerosis (ALT), which on the long run contributes to the alteration of the individual’s mental functioning (McKee et al. 917-918). Owing to the rigor associated with the NLF, the occurrence of the concussions is not rare, an aspect that requires collaborative action by the government, the public, and the NFL to find a solution to the problem. Further, a major factor found to contribute to the exacerbation of the CTE is the player’s urge to return to play, even after suffering from a confirmed case of mild brain injuries. This is especially true when considering the results of the study by Ward et al., which depicted the aggression by some of the players such as Cookie Gilchrist who seem to pride themselves in the football tackles that entail vast body collisions, which end up causing increased brain dysfunction (Ward et al.).

Mild concussions over time have been found to cause memory impairment; however, an individual can attain normal brain functioning if the exposure to the concussion triggers is stopped. However, owing to the constant engagement of the NFL players, returning to active participation in the game is not a matter of choice, as the players seem to be devoted to the game, irrespective of the health dangers involved. The study by Herring et al. established that continued exposure to the mild concussion might eventually result in post-concussion syndrome, which often emanates from poor treatment after numerous concussions (Herring et al. 398). Post-concussion syndrome is associated with behavioral, emotional, cognitive, and physical dysfunctions and impairments and may take longer to treat. The onset of the post-concussion syndrome indicates the need for the individual to quit from active participation in the NFL, which is the main causal factor. Players who return to the sport after suffering post-concussion syndrome often develop the second impact syndrome, which is an elevated dysfunction of the brain that is associated with the re-occurrence of a fatal event on the brain. At this level, a player has suffered significant brain damage and should not be involved in active participation in the game.

A study by Cantu and Frederick shows that though there been various improvements in American Football, characterized by “better education of players, technique coaching, medical supervision, handling of players by athletic trainers and emergency medical system workers, and conditioning,” there has not been a significant reduction in the number of brain injury-related conditions reported (Cantu and Frederick. 853). Further, with the increased fan base and general support from the public, the NFL has gained much reputation as a sport, leading to even more aggression by the players dung the game in an effort to impress their fans. As a result, the collisions and aggression expected in the future game are even high, an aspect that necessitates the need for a better approach towards the same. Based on a study by Levy et al., various ways can be utilized to reduce severe concussions, including but not limited to coach and player education, equipment changes, and game rule changes (Levy et al. 660).

With respect to the players and coach education, it is critical for the government in collaboration with the NFL and the public to initiate training of the players and the coaches on the possible health adversities associated with collisions and specific mental health deterioration that emanates from CTE. As already established by McKee et al., persistent head injuries, which in the case American football are due to numerous concussions suffered when playing, may result in Chronic Traumatic Encephalomyelopathy (CTEM) or Chronic Traumatic Encephalopathy (CTE), totally impairing the mental health of the players and making them incapable of carrying out their normal activities (McKee et al. 920). The education on the adverse health effects of the concussion would impart a sense of personal responsibility to the players and the coach in protecting oneself from the concussions during the games. Further, such education would also encourage the players to seek medical intervention and support during their active years of NFL participation. The medical advice given would guide the players on when to participate in when to return to play after suffering potentially brain-damaging event. Such an aspect would ensure complete healing of the players before resuming to active participation in the football.

The rule-based approach to solving the concussion suffered by the NFL and which culminates in CTE would encompass changing the rules of the game in a manner that reduces the number of concussions without affecting the overall play experience. As already evidenced in the study by Levy et al. National Alliance Football Rules Committee (NAFRC) and National Collegiate Athletic Association (NCAA) have already made significant strides in reducing head injuries by prohibiting attacks such intentionally striking an opponent with the crown, intentionally ramming or butting an opponent with a helmet, and using the head as initial attack point among others (Levy et al. 657). Therefore, to achieve better results, the players, the coaches, psychologists, and medical practitioners can collaborate on research to redefine the rules of the game in a manner that improves both the health of the players and also enhances the overall sports experience. This can entail a focus on redefining the various attack strategies during the game to reduce the aggression and impact of the tackles

Finally, equipment designs change can also be done in order to reduce the impact of the concussions, as well as any other collision. As evidenced in a study by Levy et al., this can be achieved by redesigning the helmets and the overall sports clothing in a manner that is not only lightweight but also increases the cushioning of the body and specifically the skull, in addition to providing high resistance to impacts (Levy 660-661). For instance, the study by Viano et al. on NFL player safety showed that the adoption of National Operating Committee on Standards for Athletic Equipment (NOCSAE) resulted in 51%, 35% and 65% reduction in fatal head injuries, concussions, and Cranial fractures respectively (Viano et al. 326). However, to achieve this, there is a need for comprehensive research on the most appropriate material and design that would provide high protection without negatively affecting the overall sporting experience. Specifically, the head should be well-protected from both minor and major blows, as it is the main body part that is affected by the persistent concussions suffered in the game

In conclusion, while American football is a game that is widely enjoyed by the Americans and other people across the globe, it is also a potentially harmful game that has been found to contribute to the increased cases of the CTE, with a significant number of the players suffering from the condition during or after active years of participation. CTE is associated with deteriorated brain functioning, characterized by reduced cognitive abilities, impaired memories, and distorted lines of thought, among other symptoms. Various remedies can be employed to solve this problem, including but not limited to change in the game rules, players and coach education on dangers of concussions, and finally, change in the design of the equipment and sports clothing.

Works Cited

Cantu, Robert C., and Frederick O. Mueller. “Brain Injury-Related Fatalities in American Football, 1945–1999.” *Neurosurgery*, vol. 52, no. 4, 2003, pp. 846-853.

Drew, Laura B., and William E. Drew. “The Contrecoup-coup Phenomenon.” *Neurocritical Care,* vol. 1, no. 3, 2004, pp. 385-390.

Herring, Stanley A., et al. “Concussion (Mild Traumatic Brain Injury) and the Team Physician: A Consensus Statement.” *Medicine and Science in Sports and Exercise,* vol. 38, no. 2, 2006, pp. 395-399.

Langlois, Jean A., Wesley Rutland-Brown, and Karen E. Thomas. “Traumatic Brain Injury in the United States; Emergency Department Visits, Hospitalizations, and Deaths.” 2006.

Levy, Michael L., et al. “Birth and Evolution of the Football Helmet.” *Neurosurgery,* vol. 55, no. 3, 2004, pp. 656-662.

McKee, Ann C., et al. “TDP-43 Proteinopathy and Motor Neuron Disease in Chronic Traumatic Encephalopathy.” *Journal of Neuropathology & Experimental Neurology,* vol. 69, no. 9, 2010, pp. 918-929.

Viano, David C., et al. “Concussion in Professional Football: Brain Responses by Finite Element Analysis: Part 9.” *Neurosurgery,* vol. 57, no. 5, 2005, pp. 891-916.

Viano, David C., Ira R. Casson, and Elliot J. Pellman. “Concussion in Professional Football: Biomechanics of the Struck Player—Part 14.” *Neurosurgery,* vol. 61, no. 2, 2007, pp. 313-328.

Ward, Joe, Josh Williams, and Sam Manchester. “110 N.F.L. Brains.” New York Times, Late Edition (East Coast) ed. Jul. 27, 2017. ProQuest. http://cenproxy.mnpals.net/login?url=https://search.proquest.com/docview/1923600546?accountid=40786