Youth Tackle Football: Perception and Reality

Cynthia LaBella, MD

Recently there has been significant media attention on sports-related concussions, particularly in American football. The focus has been on the risk for long-term negative health outcomes from concussions and subconcussive head impacts that may be sustained while participating in contact sports, especially for young athletes whose brains are still developing. In this issue of Pediatrics, Chrisman et al present results of their study, “Parents’ Perspectives Regarding Age Restrictions for Tackling in Youth Football,” in which they surveyed a nationally representative sample of ~1000 parents regarding their perception of concussion risk in youth tackle football and whether they would support age restrictions for tackling. Most parents (61%) would support such an age restriction, and those who are female, college-educated, or reported greater perceived risk for concussion had a higher odds of supporting an age restriction. The most notable finding of this study, however, is that most parents perceive concussion rates in tackle football to be substantially higher than they actually are. The best available and most current injury surveillance data for tackle football players reveal that ~4 to 7 out of 100 high school players will suffer a concussion during a single season. For youth players, the incidence tends to be lower at 3 to 5 in 100. However, 83% of parents in this study perceive concussion incidence to be >10 out of 100 high school tackle football players, and 25% estimated it was >50 out of 100. This misperception about concussion risk in youth tackle football is likely due to the fact that most parents form their views on the basis of headlines and stories of former players in the media, rather than from published scientific data.

The reality is that the concussion rate in youth tackle football is lower than parents perceive (3%-5% of players per season) and is similar to concussion rates in other youth contact sports, such as soccer, ice hockey, lacrosse, and even flag football. In contact sports, rates of overall injury and concussion increase uniformly with age and pubertal maturation status. This is because as bodies get larger and faster, collisions occur with greater force. Thus, concussion risk in tackle football is lowest when players are <12 or 13 years of age, before the pubertal growth spurt begins. What about the effect of tackling and subconcussive head impacts on young developing brains, even in the absence of injury? Unfortunately, the evidence on long-term outcomes is unclear. There are few studies, and they reveal conflicting results. Alosco et al administered telephone-based cognitive function tests and online surveys of behavioral and/or emotional symptoms to 214 former high school, collegiate, and professional football players in their 40s and 50s. Their data suggest that exposure to tackle football before 12 years of age is associated with cognitive impairment and depression later in life. This study
received widespread media coverage, which has led to significant public concern about the safety of youth tackle football. However, as is often the case with news reports on scientific studies, headlines tend to be sensationalized and key details are omitted. There are several limitations that prevent the generalization of this study’s findings to the broader population of tackle football players. It was not a random sample. Volunteers were recruited through Web site postings, creating selection bias for those experiencing symptoms. Subjects were asked about events during their childhood, so recall bias may have led to inaccurate reporting. The analysis did not account for the number of previous concussions. However, the group who started football before age 12 reported significantly more concussions than those who started at age 12 or older (median of 25 vs 15, respectively). This is likely the factor driving the difference between the 2 groups. Players did not indicate how many, if any, of their concussions occurred during participation in youth football. The study did not include men who only played football at the youth level and did not go on to play in high school, college, or in a professional league. There was no comparison with a control group of male peers who had never played football. It did not account for factors such as family history, substance use, and lifestyle, which are known to influence mood disorders and cognitive function. The authors highlight these limitations as reasons why their study’s findings “should not be used to inform safety and/or policy decisions in regards to youth football.” They indicate that longitudinal studies are needed to understand the long-term health effects of playing youth tackle football.

Authors of a larger, prospective study followed 3904 high school students into their 60s and 70s and compared the 834 who played football to 1858 who played noncontact sports or no sports, matching football players to the other 2 groups on the basis of age, IQ, family background, and educational level. They found no differences in cognitive function or depression when comparing football athletes to noncontact sport athletes and to nonathletes.25 Football players, however, were more likely to engage in regular moderate-to-vigorous physical activity at 35 years of age. This study has some limitations as well. The authors did not account for concussion history, position played, or exposure to football before or after high school. The study also did not make any headlines. So the public does not get a balanced report of the research. But even for those of us with a balanced view, how do we resolve the conflicting results of these studies? From these limited data, it seems a small subset of mostly collegiate and professional football players may develop long-term impairments, whereas most do not. As with many other medical conditions, intrinsic factors likely influence long-term outcomes on an individual level. One of these factors is likely the number of concussions sustained, especially those that are inadequately treated.

An important limitation of both of these studies share is that all the subjects played football many years ago during an era when concussions often went unrecognized and untreated, and rules of the game were different than they are today. This makes it difficult to extrapolate their findings to the current generation of youth football athletes. Decades ago, athletes frequently continued to play with concussion symptoms, which were likely compounded with repeated subsequent impacts. We now know that repeated concussions within a short time frame, before the first concussion has resolved, typically lead to more severe and prolonged symptoms. Currently, the standard of care is for concussed athletes to be removed from contact sports until they are completely recovered and have received clearance from a qualified health care professional to return to play. Additionally, concussion awareness has significantly increased in the past decade, so athletes are much more likely to report symptoms and seek care than in the past.

Football culture and rules have also changed since the men in these 2 studies played. For example, spear tackling and other unsafe tackling and blocking techniques are no longer allowed. At the youth level, full contact is limited to ≤25% of practice time, and coaches must complete annual training in concussion recognition and how to teach proper tackling and blocking techniques. This type of coach education and practice contact restrictions have decreased injury rates and head impacts.26,27 More recently, Pop Warner Football eliminated kick-off returns for players under age 12 to reduce the number of higher-speed collisions. It also banned the 3-point stance for players under age 11 to reduce repetitive head impacts with blocking. As Chrisman et al2 noted, age restrictions for tackling have also been proposed to reduce tackling-related injuries in the youngest players.

A number of longitudinal studies are ongoing to measure health outcomes of tackle football athletes who are playing in this current era of new rules and improved concussion awareness and management. One was just published in which authors examined 3462 collegiate football athletes from 2014 to 2018. There were no differences in neurocognitive function between those who started playing football
before versus after age 12, even after adjusting for age, learning accommodations, and concussion history.28

Rules will continue to evolve as scientists, policy makers, and youth sports governing bodies work together to objectively evaluate the growing body of research, accounting for quality and limitations of each study, in an effort to make targeted changes to enhance the safety of tackle football at all levels of play. As physicians, we can help parents interpret the research and provide them with the information that is missing from the headlines.

REFERENCES


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