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Abstract

The Role of Prevention and Diagnosis in Sports-Related Traumatic Brain Injury: A Review †

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Introduction: Traumatic brain injury (TBI) is a disruption of normal brain function caused by falls, violence, car accidents, and contact sports. It is considered one of the leading causes of death and disability. The topic gained greater scientific and media visibility starting in the 21st century with research on chronic traumatic encephalopathy (CTE). The objective of this study is to analyze the risk factors, the impacts of these injuries on athletes, and the innovations related to diagnosis and prevention. Methodology: This study conducted a normative literature review using articles from PubMed, Scielo, and ScienceDirect. The publications are recent (2021–2025) and focus on TBI in the context of sports. Results: Sport-related concussion and CTE primarily affect athletes in contact and collision sports such as football, rugby, and boxing. The first type of trauma (concussion) is an acute condition with a good prognosis if the athlete is removed from the field early. CTE is a serious chronic condition caused by repetitive head impacts (RHI). To prevent these impacts, it is possible to modify game rules, adopt physiological strategies like neck strengthening, and create laws to protect athletes. The identification of microRNAs in a player's saliva is a laboratory tool that has helped with the objective and precise diagnosis of concussion. Conclusions: In the long term, head injuries can lead to cognitive damage and functional dependence. Therefore, it is necessary to prevent impacts and diagnose the patient early, especially in cases of concussion, to prevent long-term effects.

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