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Traumatic Brain Injury and Subsequent Language Deficit in Athletes and Sports Persons

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ABSTRACT

Traumatic Brain Injury (TBI) is a significant concern in the field of sports, with athletes being vulnerable to brain injury owing to the physical nature of their activities. This brief communication aims to explain the relationship between TBI and subsequent language deficits following the traumatic brain injury. The effects can be divided into immediate and secondary effects. The immediate effects of TBI, include physical impairment and cognitive deficits, It can also invade the language due to the intricate relationship between cognition and language. Secondary deficits can also effect the same domain, the basic difference is that the symptoms can be gradual and seen over time. The article also touches on the assessment methods used for assessing and diagnosing these conditions and possible intervention in remediating the condition. The current topic becomes crucial in devising the effective support systems, which can facilitate recovery and reintegration into sports and improving the quality of living.

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Introduction

Traumatic Brain Injury (TBI) has emerged as an important concern in the field of sports. This is because of a simple reason that the athletes indulge in activities which makes them vulnerable to concussive and sub-concussive injuries. The consequences are often not limited to physical injuries and can have serious impacts leading to cognitive impairments and deficits in various functional domains. As cognition and language are related domains, language also can be affected in these individuals and can affect the functional communication and limit the social interaction, thus the overall quality of life can turn compromised [1]. The effects of traumatic brain injury is directly dependent on the locus and extent of injury. The severity of concussions can range from mild to severe and the deficits can also range proportionately. However the part of the brain affected can be a determinant of the condition [2].

Considering the patho physiology, the consequences can studies under two heads, primary and secondary. The primary brain injury may involve focal injuries such as contusions and diffuse axonal injury and the symptoms may be seen immediately following the brain damage while the secondary damage can be manifested after a lapse of time and can include the bio-chemical and physiological alterations that occur post injury and can be a consequence of the changes in the neurotransmitters, formation of free radical, oxidative stress and also inflammations [3]. These processes can occur solitarily or in combination and can disrupt the cognitive linguistic processing [4].

Symptoms

Cognitive include a spectrum of activities including attention, memory, reasoning, justification etc. These domains can include a sub-set of domains, for example attention has different variants like selective attention, divided attention and sustained attentions. While memory also has variants like short term memory, long-term memory and working memory These domains can directly be affected as a consequence of brain injury. However there is a clear dearth of literature concerning the effect of brain injury on the aforementioned domains and its sub-domains. Hence the specific effect cannot be elucidated [5]. However, it is noteworthy that these domains come under the purview of brain injury and has to be addressed in future studies.

Language and cognition are two interconnected domains. There are many views that cognition precedes language, language drives cognition, regardless of whatever is true, the relationship between these two domains is well established. Brain damage can affect language directly. Word finding can be invaded as a consequence of brain damage. This word retrieval deficit is due to a lexical retrieval deficit and people affected by the condition may not be able to retrieve the words. Brain injury can lead to Aphasia (a language disorder caused due to the damage to the brain areas such as Broca's area and Wernicke's area). Aphasia can further be classified into receptive and expressive aphasia based on whether the expression or reception is affected [5]. Functional communication is another domain which can be affected as a consequence of brain injury. Again this can be seen in extensive brain damage cases.

The purview of sports evoked brain injury also comes within the purview of speech language pathologists. Speech language pathologists directly target the cognitive and speech language deficits caused due to the brain injury by using formal and informal deficits caused due to brain injury. In addition to the language deficits, slurred speech, disturbances in movement also is addressed by these professionals. Early identification of language deficits allows for timely intervention, which can mitigate long-term impacts. Given the unique demands athletes face post-injury, assessments should consider the specific linguistic, cognitive, and social contexts vulnerable to be affected and these domains should be covered in the assessment [6]. In adjunct to the assessment, rehabilitation also comes within the purview of speech language pathologists. The same domains taken in assessment has to be reflected as therapy goals and must be addressed in therapy. The goals are often deficit based and when the affected process is taken up in therapy [6].

Conclusion

The overlap of TBI and cognitive language deficits in athletes is a critical area of concern warranting further exploration. This domain is still in the conception stage and there is clear dearth of literature concerning this research question. This communication emphasises on the importance of identifying the cognitive-language impairment. This cognitive linguistic impairment can be as a significant consequence of TBI, which can be seen in athletes. The premise of the study is that the future research should focus individuals suffering from TBI in sports contexts. Furthermore, this will facilitate on studies designing effective assessment and intervention for these individuals affected by the condition.

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