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Assessing Athletes' Cardiac Parasympathetic Activity at Home during Sport Rehabilitation Following Concussion

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Introduction

Concussions are a common occurrence in sports, particularly in contact sports such as football, hockey, and soccer. These traumatic brain injuries can have a significant impact on athletes, affecting their physical, cognitive, and psychological well-being. As athletes recover from a sport-related concussion, it is crucial to closely monitor their progress and ensure their safe return to sport. One area of interest in the rehabilitation process is the assessment of cardiac parasympathetic activity, which plays a vital role in regulating Heart Rate Variability (HRV). HRV is an indicator of the autonomic nervous system's function, specifically the balance between sympathetic and parasympathetic activity. A healthy autonomic nervous system maintains a dynamic equilibrium between these two branches, allowing the body to respond appropriately to stressors and maintain cardiovascular stability [1].

Concussion can disrupt the autonomic balance, leading to alterations in HRV and cardiac parasympathetic activity. Traditionally, these assessments have been conducted in a controlled clinical setting using Electrocardiography (ECG) equipment. However, this approach has limitations, as it requires athletes to visit healthcare facilities repeatedly, which can be time-consuming and impractical, especially during the rehabilitation phase. To address these limitations, home-based measurements of nocturnal cardiac parasympathetic activity have emerged as a convenient and effective alternative. By utilizing portable and user-friendly devices, athletes can collect data on their HRV in the comfort of their own homes, providing valuable information about their autonomic nervous system recovery [2,3].

Description

This study aims to assess athletes' cardiac parasympathetic activity at home during sport rehabilitation following a concussion. Traditional methods of monitoring Heart Rate Variability (HRV) and cardiac parasympathetic activity involve clinical settings and Electrocardiography (ECG) equipment [4]. However, these approaches can be impractical and time-consuming for athletes during the rehabilitation phase. To overcome these limitations, this study proposes the use of home-based measurements of nocturnal cardiac parasympathetic activity. Athletes will utilize portable and user-friendly devices to collect data on HRV in the comfort of their own homes. These measurements will provide valuable information about the recovery progress of the autonomic nervous system and potential dysregulation. The feasibility and utility of this approach will be assessed by analyzing the HRV patterns over time. Researchers will compare the data collected at home with traditional clinical measurements to validate the reliability of home-based assessments. Additionally, the study will explore the potential benefits of these assessments in optimizing the return-to-sport decision-making process [5,6].

Conclusion

This study aims to determine the feasibility and utility of home-based measurements of nocturnal HRV. If proven effective, home-based assessments can significantly enhance the rehabilitation process by providing convenient and accessible monitoring options for athletes. By closely monitoring HRV patterns, potential dysregulation can be identified, allowing for timely intervention and personalized rehabilitation plans. The findings from this study will have important implications for athletes, coaches, and medical professionals involved in concussion management. It has the potential to improve safety protocols and contribute to more informed and individualized decisions regarding athletes' return to sport. It has the potential to enhance the well-being and long-term outcomes of athletes, ensuring a successful return to their respective sports while prioritizing their health and recovery.

Acknowledgement

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Conflict of Interest

There are no conflicts of interest by author.

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