The recurrence of anterior cruciate ligament ruptures in sedentary young people: A literature review

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ABSTRACT

Introduction: Anterior cruciate ligament (ACL) tears represent a significant problem, especially among sedentary young people. Objectives: To analyze the following factors: gender\sex, regular physical activity and age influence the prevalence of injuries. Methods: The review included 10 articles, observed in the following databases: Scielo, Lilacs and Google Scholar. Literature Review: Comprehensive analysis of risk factors reveals that prior history of ACL injuries, inadequate knee biomechanics, and participation in high-risk sports increase the likelihood of recurrence. The influence of age is explored, indicating that bone and muscle maturation affect knee stability, with implications for injury recurrence. In addition, gender is identified as a relevant factor, with evidence of differences in injury rates between men and women. The central finding of this review is the fundamental importance of physical activity in preventing ACL tears in sedentary youth. The promotion of active lifestyles and practical specific exercises to strengthen the knee are crucial elements in reducing the incidence and recurrence of these injuries. Therefore, it is essential to encourage young people to adopt regular physical activity practices as part of preventive strategies. Conclusion: Considering the risk factors, age, gender, and promotion of physical activity, it is possible to develop effective strategies to mitigate the risk of recurrence of these injuries and improve the quality of life of affected young people.

Keywords: Cruciate Ligament, Injury, Physical Activity.

INTRODUCTION

Anterior Cruciate Ligament (ACL) injury is a significant concern in young people, especially those who lead a sedentary lifestyle. This injury, which affects the knee, can result in chronic pain, instability, and even the need for surgery. The recurrence of ACL tears is an additional concern, as it can lead to long-term complications and impact the quality of life of affected young people (ARDERN, et al, 2014).

Anterior Cruciate Ligament (ACL) injuries represent a significant challenge in the field of sports medicine, especially when it comes to sedentary young people. The ACL is one of the crucial ligaments in the knee, playing a vital role in joint stability and function. When an ACL rupture occurs, whether due to sports trauma or not, the impacts are profound, with chronic pain, instability and the possibility of long-term impairment of quality of life (GRIFFIN, 2006).

A worrying issue that stands out in this context is the recurrence of these lesions, particularly in young people who adopt a sedentary lifestyle. The recurrence of ACL tears not only increases the personal burden for affected individuals, but also imposes substantial clinical and economic challenges on the healthcare system. Therefore, it is imperative to understand the underlying factors that contribute to this recurrence and to identify effective prevention and treatment strategies (ARDERN, et al, 2014; GRIFFIN, 2006).

OBJECTIVES

1. To analyze the risk factors associated with the recurrence of ACL tears in sedentary young people;
2. To examine how age affects the incidence and recurrence of these injuries;
3. To analyze how gender influences the recurrence of ACL tears;
4. Highlight the relevance of physical activity in preventing ACL tears.

These objectives will guide the critical analysis of the available scientific literature on the topic and provide important insights for the development of effective prevention and treatment strategies.

RISK FACTORS

The recurrence of Anterior Cruciate Ligament (ACL) tears in sedentary young people is directly related to pre-established factors, such as: History of previous ACL injuries: Several studies highlight that individuals with a history of previous ACL injuries are more likely to recur, even after treatment and rehabilitation; Inadequate knee biomechanics: Inadequate knee biomechanics, such as lack of muscle stability, can increase the risk of recurrence of ACL injuries; Participation in high-

risk sports: Some sports, such as soccer and basketball, are considered high-risk for ACL injuries, and sedentary youth involved in these sports may be at higher risk; Female gender and women under 25 years of age (BEISCHER, et al, 2019; (MIHATA, et al, 2006; SUGIMOTO, et al, 2012).

LITERATURE REVIEW

Anterior Cruciate Ligament (ACL) injuries represent a significant challenge in the field of sports medicine, especially when it comes to sedentary young people. The ACL is one of the crucial ligaments in the knee, playing a vital role in joint stability and function. When an ACL rupture occurs, whether due to sports trauma or not, the impacts are profound, with chronic pain, instability, and the possibility of long-term impairment of quality of life. A worrying issue that stands out in this context is the recurrence of these lesions, particularly in young people who adopt a sedentary lifestyle. The recurrence of ACL tears not only increases the personal burden for affected individuals, but also imposes substantial clinical and economic challenges on the healthcare system.

Therefore, it is imperative to understand the underlying factors that contribute to this recurrence and to identify effective prevention and treatment strategies (HEWENTT, 2005):

Young people and adolescents, especially in the age group between 15 and 25 years, are notably affected by ACL tears. This group represents a crucial period of intense physical activity, sports and bone-muscle development in which ACL injuries can have substantial impacts on daily activities and participation in sports.

It is observed that women have a significantly higher incidence of ACL tears compared to men, especially female adolescents and young adults. Anatomical, biomechanical, and hormonal factors may contribute to this disparity, requiring an in-depth analysis to develop effective prevention and treatment strategies adapted to each gender (SUGIMOTO, et al, 2012).

In addition, this review will emphasize the relevance of physical activity as a fundamental preventive measure. The promotion of active lifestyles and the incorporation of specific exercises for strengthening the knee can be crucial elements in reducing the incidence and recurrence of these injuries (MIHATA, et al, 2006).

The predominance of Anterior Cruciate Ligament (ACL) tears in young women, especially in the age group between 15 and 25 years, can be attributed to a number of complex and interrelated factors, such as:

1. Anatomical and Biomechanical Factors: Hip and Knee Anatomy: Anatomical differences between men and women, such as the width of the pelvis and the Q angle (the inclination of the femur relative to the tibia), can create knee biomechanics that puts women at higher risk for ACL injuries. This can increase tension on the ligament during sports activities. Muscle Activity: Muscle activation and neuromuscular control can also be different between genders.

Young women may exhibit movement patterns that result in increased ACL loading during sports activities, such as landing jumps (SWART, et al, 2014).

2. Hormones and Menstrual Cycle: Hormonal fluctuations during the menstrual cycle can affect joint stability and ligament strength. Some research suggests that increased estrogen levels during certain periods of the menstrual cycle can make ligaments, including the ACL, looser and less resistant to injury (LAI, et al, 2017).
3. Behavioral Risk Factors: Physical Activity and Sports Participation: Young women often participate in high-impact sports and explosive movements, which can increase the risk of ACL injuries. In addition, there may be a lack of adequate neuromuscular preparation and strengthening training in sports programs (LAI, et al, 2017; SWART, et al, 2014).
4. Physical Fitness: Lack of muscle strength and knee stability due to a sedentary lifestyle or inadequate training can predispose young women to ACL injuries. It is important to note that these factors do not act in isolation, but often interact to increase risk. Gender differences in anatomy, biomechanics, and hormonal response may create an environment in which ACL injuries are more common in young women. Therefore, prevention and targeted training, including quadriceps strengthening, improving neuromuscular control, and raising awareness of safe movement techniques, are key to reducing the risk of ACL injuries in young women (SWART, et al, 2014).

In summary, the recurrence of ACL tears is more observed in young and sedentary women. Critical analysis of these aspects is essential to develop effective prevention and treatment strategies and, thus, improve the quality of life of young people affected by these injuries (LAI, et al, 2017; SWART, et al, 2014).

CONCLUSION

The analysis of risk factors revealed that a previous history of ACL injuries, inadequate knee biomechanics, and participation in high-risk sports are elements that increase the probability of recurrence of injuries. The influence of age was examined, demonstrating that bone and muscle maturation can affect knee stability, with implications for injury recurrence. In addition, gender was identified as a relevant factor, with evidence of differences in injury rates and severity between men and women.

However, a key finding that stands out in this review is the importance of physical activity in preventing ACL tears in sedentary youth. The reviewed scientific literature emphasizes that promoting active lifestyles and incorporating specific knee strengthening exercises can play a key

role in reducing the incidence and recurrence of these injuries. Therefore, it is essential to encourage young people to adopt regular physical activity practices as part of preventive strategies.

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