

About Porto Open: Tennis Injuries in Athletes

Sobre o Porto Open: Lesões de Ténis em Atletas

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RESUMO

Introdução: Apresentamos uma análise descritiva das lesões de ténis entre os atletas que participam no Porto Open, um torneio jogado no exterior, em piso rápido e que se insere na categoria ATP 125 do circuito mundial de ténis. Este estudo tem como objetivo fornecer informações sobre padrões de lesões, prevalência e potenciais fatores de risco específicos associados a prática desportiva de ténis.

Métodos: Realizámos um estudo observacional retrospectivo para analisar as lesões relacionadas com o ténis entre os atletas participantes no Porto Open 2023.

Resultados: O estudo incluiu 50 atletas do género masculino de 20 nacionalidades diferentes, sendo as nacionalidades portuguesa (n=13; 26%) e francesa (n=12; 24%) as mais frequentes.

Conclusão: Através da avaliação do tipo de lesões, principais regiões do corpo afetadas e os mecanismos de lesão, este estudo procura promover a implementação de estratégias de prevenção de lesões e consequente o bem-estar dos atletas.

Palavras-chave: Desempenho Atlético; Lesões em Atletas/prevenção e controlo; Ténis/lesões;

ABSTRACT

Introduction: The article presents a descriptive analysis of tennis injuries among athletes participating in the Porto Open, an outside, hard court tournament encompassed within the ATP 125 category in the tennis circuit. This study aims to provide insights into injury patterns, its prevalence, and potential risk factors.

Methods: We conducted a retrospective observational study to analyze tennis-related injuries among athletes participating in the Porto Open 2023.

Results: The study included 50 male athletes from 20 different nationalities, with Portuguese (n=13; 26%) and French (n=12; 24%) nationalities being the most frequent.

Conclusion: Through an examination of the different types of injuries, affected anatomical regions, and injury mechanisms, this analysis aims to provide pertinent insights to enhance injury prevention strategies and promote the overall well-being of athletes.

Keywords: Athletic Injuries/prevention and control; Athletic Performance; Tennis/injuries

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INTRODUCTION

Tennis injuries, particularly in high-stakes tournaments like the Porto Open, an ATP (Association of Tennis Professionals) 125 category tennis tournament, have garnered attention due to their potential impact on player performance and well-being.^{1,2}

This research investigates injury patterns, affected anatomical regions, and the sociodemographic characteristics of athletes participating in the tournament, addressing the need for tailored prevention strategies. Objectives include analyzing injury prevalence among Porto Open athletes and developing evidence-based strategies to enhance safety and performance. By highlighting injury dynamics within this specific context, our goal is to optimize the health and performance of athletes.

MATERIAL AND METHODS

We conducted a retrospective observational study to analyze tennis-related injuries among athletes participating in the Porto Open 2023. Participants eligible for inclusion were athletes who actively participated in the Porto Open tournament held from July 31 to August 06, 2023. Injury data, along with sociodemographic information, were collected from medical and physiotherapeutic records, tournament reports and official ATP site records. Statistical analysis, conducted by an independent researcher, included descriptive statistics and was performed using SPSS Statistics v26 software. Participant confidentiality and data protection were strictly adhered to.

RESULTS

The study included 50 male athletes from 20 different nationalities, with Portuguese (n=13; 26%) and French (n=12; 24%) nationalities being the most frequent. Findings from the research indicate that the participants had an average age of 26 years, with a standard deviation of 4 years. Additionally, the median ATP ranking of the participants at the time of the tournament was 356, with an interquartile range (IQR) of 335.

In the context of this tournament, a total of 42 injuries were identified. The most common injury documented was grade 1 lower extremity muscle injuries, in Munich classification, characterized by tightness and cramping but without actual fiber damage, corresponding to 52% (n=22) of the injuries.

For instance, there were 12 (29%) shoulder joint complex-related injuries and 8 ankle ligament injuries (n=19), respectively, identified.

Moreover, one medical intervention was required after a physically demanding match due to a case of extreme and generalized exercise-associated muscle cramping. In fact, it was effectively resolved through a comprehensive approach involving stretching, cooling techniques, oral hydration, and the addition of sodium chloride (NaCl). Notably, there was no necessity for intravenous fluid infusion. Following a period of rest, reinforced hydration, and a balanced diet, the athlete exhibited total recovery, able to play on the subsequent day. This instance underscores the importance of prompt and well-rounded medical responses to address specific challenges encountered by athletes during the tournament.

DISCUSSION

Tennis, renowned for its high-energy and physically demanding nature, exposes athletes to a range of injuries, which may arise as acute trauma or from overuse, with significant impacting in athletes' performance.¹ The tennis court provides the setting for players to undergo rapid accelerations, sudden decelerations, swift changes of direction, and powerful strokes, creating an environment that predisposes players to various potential injuries.

At the Porto Open, the retrospective cohort study highlights the prevalence of injuries due to specific characteristics inherent in the sport. So, lower extremity injuries occur often due to the sport's frequent abrupt bursts of speed and rapid changes in direction. Shoulder joint complex-related pathology commonly results from the repetitive overhead movements,³ such as serves and volleys, and ankle ligament injuries often arise from quick lateral movements, pivoting, or sudden stops.¹

In recent years, tennis has witnessed a paradigm shift in its approach to injury prevention.¹ Thus, the implementation of evidence-based preventive measures, such as advanced training and conditioning, a well-structured tournament schedule, biomechanical analysis, injury surveillance systems, player education, sports science and technology, nutrition and hydration, and psychological well-being, is critical.

Tennis places rigorous demands on the body, requiring players to move swiftly across the court, execute powerful strokes, and engage in intense rallies.⁴ Research studies have consistently shown that athletes who undergo an advanced training and comprehensive conditioning programs are less prone to injuries.^{4,5} These programs are meticulously designed to enhance athletes' physical fitness, agility, strength, and flexibility, representing a fundamental aspect of injury prevention in tennis.⁶

The strategic planning of an annual tournament schedule by players and their technical team is crucial in ensuring a well-paced and injury-conscious approach in tennis. Also the choice of tournament structure and scheduling significantly impacts injury rate.^{1,6,7} Ensuring adequate rest time between games, is fundamental, yet it can be challenging, especially during the early phases of the tournament due to the increased frequency of games and the resulting demands on the players. This strategic approach has a recognized impact on reducing the incidence of overuse injuries.

Additionally, different playing surfaces, including clay, grass, and hard courts, possess distinctive characteristics, with specific challenges to athletes, that influence gameplay and the types of injuries that are more probable to occur.⁸ Clay courts, due to their softer composition, result in a lower incidence of impact-related injuries. However, it can challenge players, especially with sudden stops and changes in direction, often causing ankle sprains and muscle strains. On the other hand, hard courts provide a consistent bounce and a faster pace, factors that contribute to a higher likelihood of overuse injuries, particularly in the lower extremities. Stress fractures and patellar tendinopathy are among the most common injuries observed in players competing on hard courts due to the repetitive and forceful nature of movements required on this surface. Moreover, grass courts, distinguished by their unique, often irregular, and unpredictable surface, present distinctive challenges, with ankle sprains being the most frequent injury among players competing on grass surface.⁸⁻¹⁰ Furthermore, proper court maintenance is crucial to ensure the integrity and safety of players, especially on grass courts, where surface uniformity and stability play a pivotal role in injury prevention.

Furthermore, biomechanical analysis has garnered attention in injury prevention¹¹ by allowing coaches, physicians, and physiotherapists to analyze every aspect of a player's technique. This process, powered by advanced technology such as high-speed cameras and motion capture systems,^{12,13} involves the meticulous examination of an athlete's movements and techniques, enabling analysis not only for optimizing movement efficiency, force distribution, and technical enhancement, but also for identifying potential sources of injuries.¹⁴ Advanced sports science and technology have revolutionized injury prevention in tennis.¹⁵ Athletes now benefit from wearable¹⁵ fitness trackers that provide real-time data on heart rate, fatigue levels, and sleep patterns.¹⁶ This information guides the development of tailored training and recovery plans, ensuring athletes train or compete when their bodies are primed for optimal performance. Furthermore, tennis tournaments have increasingly utilized

advanced sports science labs to assess players' physiological profiles. This allows for the creation of personalized training and recovery strategies that enhance performance while mitigating injury risk.

The athletes' comprehension of the importance of proper warm-up and cool-down routines assists in recognizing early signs of injury and seeking immediate medical aid when necessary. Furthermore, as they gain knowledge on injury prevention techniques, emphasizing proper techniques and the importance of rest and recovery, it empowers them to actively protect themselves both on and off the court.^{1,7} Nutrition and hydration play a pivotal role in injury prevention for tennis athletes.¹⁷ Maintaining a balanced diet is essential for muscle recovery and overall health, particularly during high-intensity tournaments. Inadequate hydration can lead to issues such as exercise-associated muscle cramping (EAMC), as evidenced in the Porto Open, impacting an athlete's performance and well-being on the court. So that, nutritionists and dietitians collaborate closely with players to develop individualized nutrition plans tailored to their specific needs. These plans encompass the intake of essential nutrients, vitamins, and minerals that support muscle repair and overall well-being.^{18,19} Furthermore, mental health and psychological well-being are increasingly recognized as crucial components of injury prevention²⁰ in tennis since the psychological stress, anxiety, and pressure of competitive sports can significantly contribute to increased injury risk.^{20,21} Hence, sports psychologists significantly contribute to enhancing athletes' mental well-being, fostering mental resilience, emotional control, and self-confidence,^{22,23} ultimately leading to improved performance and overall health.²⁴ Moreover, injury prevention should not be limited to professional athletes. Ensuring the well-being and education of young players is crucial for the future sustainability and prosperity of the sport. Efforts to educate young athletes and their parents about proper training techniques, injury prevention, and the importance of balanced physical and mental development are crucial for building a healthy and sustainable tennis community. These initiatives aim to establish lifelong habits of safe and effective training, creating a foundation for aspiring tennis players to enjoy the sport while reducing the risk of injuries throughout their tennis journey.

CONCLUSION

In summary, the Porto Open 2023 study highlights the prevalence and patterns of tennis-related injuries among male athletes from various nationalities. The incidence and impact of injuries in tennis have prompted a remarkable evolution in the approach to injury prevention. Tennis injury prevention strategies, including advanced training, biomechanical

analysis, player education, sports science and technology, nutrition, hydration, and psychological well-being, have become critical components of the sport.

These comprehensive measures not only reduce the risk of injuries but also enhance athletes' overall performance, longevity, and quality of life. Furthermore, extending injury prevention efforts to youth generations ensures the sustained growth of the sport. So tennis injury prevention is not merely a set of strategies; it represents an investment in the well-being and success of athletes. By prioritizing injury prevention, tennis not only mitigates physical risks but also secures its place as a dynamic and enduring sport enjoyed by athletes of all ages and backgrounds.

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MMG: Responsável pelo conteúdo intelectual, concepção e desenho do estudo, interpretação dos dados e redação do

artigo, recolha e análise dos dados e pela revisão crítica do conteúdo.

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MMG: Responsible for the intellectual content, conception and design of the study, interpretation of the data and writing of the article, collection and analysis of the data and critical revision of the content.

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