Changing Concepts for the Diagnosis of Carpal Tunnel Syndrome in Powerlifting Athletes with Disabilities

Mudando os conceitos para o diagnóstico da Síndrome do Túnel do Carpo em atletas do halterofilismo do esporte adaptado

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Abstract

Objective To examine the prevalence of carpal tunnel syndrome in powerlifting athletes with disabilities.

Methods The present study evaluated the presence and intensity of pain (numerical scale), nocturnal paresthesia (self-report), and nerve compression (Tinel and Phalen signs) in wheelchair- and non-wheelchair-bound powerlifting athletes with disabilities. The clinical diagnosis of carpal tunnel syndrome was confirmed by the presence of two or more signs/symptoms.

Results In total, 29 powerlifting athletes with disabilities were evaluated. None of the athletes reported the presence of pain or nocturnal paresthesia. The Tinel sign was present in 1 (3.45%) wheelchair-bound athlete. A positive Phalen test was present in 3 (10.35%) athletes (1 wheelchair-bound and 2 non-wheelchair-bound). Concurrent positive Tinel sign and Phalen sign tests were found in 2 (6.89%) athletes (1 wheelchair-bound and 1 non-wheelchair-bound).

Conclusion Carpal tunnel syndrome was clinically diagnosed in 2 (6.89%) out of 29 powerlifting athletes with disabilities.

Keywords

- athletic injuries
- nerve crush
- hand
- sports medicine

Resumo

Objetivo Examinar a prevalência da síndrome do túnel do carpo em atletas do halterofilismo do esporte adaptado.

Métodos Este estudo avaliou a presença e a intensidade da dor (escala numérica), a parestesia noturna (autorrelato), e a compressão nervosa (sinais de Tinel e de Phalen) em atletas do halterofilismo do esporte adaptado em cadeira de rodas e sem cadeira de rodas. O diagnóstico clínico da síndrome do túnel do carpo foi confirmado pela presença de dois ou mais sinais / sintomas.

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Resultados Vinte e nove atletas de halterofilismo de esporte adaptado foram avaliados. Nenhum dos atletas relatou a presença de dor ou parestesia noturna. O sinal de Tinel estava presente em 1 (3,45%) atleta de cadeira de rodas. O teste de Phalen positivo estava presente em 3 (10,35%) atletas (1 cadeira de rodas e 2 sem cadeira de rodas). Testes positivos de sinais de Tinel e de Phalen concomitantemente foram encontrados em 2 (6,89%) atletas (1 cadeira de rodas e 1 cadeira de rodas).

Conclusão A síndrome do túnel do carpo foi diagnosticada clinicamente em 2 (6,89%) dos 29 atletas com deficiência física.

Palavras-chave
- traumatismos em altetas
- compressão nervosa
- mão
- medicina esportiva

Introduction

A review of the literature[1] regarding the most common injuries related to excessive use of the wrist in athletes demonstrated that acute carpal tunnel syndrome (CTS) is occasionally present in young athletes. Carpal tunnel syndrome is typically secondary to tenosynovitis caused by repetitive activities of the flexors of the fingers.[1] A previous systematic review[2] demonstrated the presence of CTS in a variety of athletes, including cyclists, fighters, football players, weightlifters, archers, and athletes in wheelchairs. The spine, shoulders, and knees are the most commonly affected areas in athletes that practice powerlifting,[1] and powerlifters have reported that the hand and wrist pain is worse in the supine position.[3]

Although the increasing number of athletes with disabilities is a global phenomenon, there are few studies on injury patterns, risk factors, and prevention strategies in disabled athletes. Competitiveness, among other things, has led to an evolution in the process of high-performance training,[4] and pain is typically a part of life for athletes who practice adaptive sports[11]. Willik et al.[5] reported that the most common injuries of paralympic weightlifting athletes at the London Olympic Games in 2012 were in the shoulders, thorax, and elbows. While previous studies have reported the presence of CTS in athletes who practice adaptive sports,[6,7] none have focused on the sport of powerlifting. Therefore, the present study examined the prevalence of CTS in powerlifting athletes with disabilities.

Methods

The present cross-sectional observational study was approved by the Medical Ethics Committee of the University Hospital (no: 2.397.090). Written permission was obtained from all participating athletes.

The authors assessed powerlifting athletes with disabilities at local training centers; both wheelchair and non-wheelchair users were included. Athletes with intellectual disabilities that precluded the clinical evaluations used in the present study were excluded. The parameters measured were the presence and intensity of pain using a numerical pain rating scale, median nerve compression/injury symptoms by the Tinel sign, nocturnal paresthesia by self-report, and the Phalen test. Paresthesia during the Phalen and Tinel sign tests was also evaluated according to self-report. The clinical diagnosis of CTS was confirmed by the presence of two or more signs/symptoms.

Results

A total of 29 powerlifting athletes with disabilities were evaluated in the present study. The mean age $\pm$ standard deviation was of 31 $\pm$ 12.3 years (range: 14–50 years), and there were 17 (59%) males and 12 (41%) females. In total, 15 (52%) athletes were not wheelchair users and 14 (48%) were. None of the athletes reported the presence of pain (intensity score $= 0$) or nocturnal paresthesia. The Tinel sign was found in 1 (3.45%) athlete who was a wheelchair user. A positive Phalen test was found in 3 (10.35%) athletes (1 wheelchair user and 2 non-wheelchair users). A steady Tinel sign and positive Phalen test were found in 2 (6.89%) athletes (1 wheelchair user and 1 non-wheelchair user). No relationship was found between the presence of symptoms/signs and wheelchair use.

Discussion

Hand injuries in adaptive sports athletes are often described in the literature.[6–9] Although several studies have been conducted on CTS in adaptive sports athletes,[6,7,10,11] none have evaluated CTS in powerlifting athletes with disabilities. The clinical diagnosis of CTS is not always simple because of variations in the frequency and intensity of signs and symptoms. Furthermore, because common CTS symptoms, such as numbness and tingling, can appear sporadically in the general population, they do not necessarily indicate clinical CTS.[12]

With the exception of the intense numbness that is sometimes described by patients as painful, pain is not a classical symptom of CTS.[13] According to the American Academy of Orthopedic Surgeons (AAOS) recommendations, the diagnosis of CTS should be made based on clinical examination. While electrical studies should be performed for confirmation or to assist in a differential diagnosis,[14] the diagnosis of CTS should not be made solely by eletrical studies as previous studies have reported the occurrence of false positive results.[15] Moreover, several studies have shown that changes in electroneuromyography are more frequent than clinical symptoms.[6,16] However, we believe

some studies overestimate electroneuromyography findings in relation to the clinical symptoms in athletes who practice adaptive sports.[7,17,18]

Chammas et al.,[19] in their studies, reported that the existence of nocturnal paresthesia is the most sensitive symptom with a sensitivity of 96%. The test with the best sensitivity is direct compression (Paley and McMurphy) with 89%, followed by the Semmes-Weinstein Phalen and monofilament tests, with 83%. The score of Katz et al.[20] has a sensitivity of 76% in its typical form with tingling, numbness, swelling or hypoesthesia with or without pain that affects at least two of the first three fingers, palm and dorsum of the excluded hand. The most specific tests are the score of Katz et al.[20] (76%) and Tine'l signal (71%). The authors reported that the diagnosis of CTS has a probability of 0.86, provided that 4 tests show an abnormal combined result (compression test, monofilaments, Katz et al.[20] score, and nocturnal symptoms). If these four tests present normal results, the probability of the patient having CTS is of 0.0068.

Fulcher et al.[21] reported the presence of compression syndrome during the palmar grasp of a club, racket, or paddle; when the hand acts against a ball, as in volleyball or handball; and when flexion and flattening of the hand is required to support body weight, as in gymnastics. Our search for symptoms of CTS in powerlifting disabled athletes was motivated by the palmar grip on bars associated with the use of wheelchairs or crutches in their daily lives. The absence of pain in the hand and lack of nocturnal paresthesia was surprising considering the intense hand and wrist use by these athletes during the practice of sports and in their daily lives.

In our study, for the diagnosis of CTS, the athletes were asked about the presence of pain in the hands along with the presence of nocturnal paresthesia and the presence of the Phalen test and the Tinel sign. Unlike some studies[5,8,17], our sample was not composed of symptomatic patients, but of a group of athletes who could develop the symptoms. The absence of nocturnal paresthesia in our results determined that other tests were not to be performed. It was not possible to apply the Katz et al.[20] score due to the absence of symptoms. The Paley and McMurphy tests were not used because they are not the most used tests. One of the six AAOS criteria for clinical diagnosis of CTS is the finger sensibility test. We believe the sensibility test is very important for the clinical diagnosis, as well as a useful tool for the evaluation of treatment outcomes. This test was not performed because the evaluation of the athletes was made inside the training center, with no ideal conditions for an accurate sensitivity test. We believe this one of the weakness of our research.

The athletes who presented paresthesia during the Tinel sign or Phalen tests claimed that the frequency and intensity of the symptoms were not sufficient to seek medical treatment, and they were not interested in performing electrical tests for diagnostic confirmation.

Despite the numerous studies reporting CTS in athletes who practice adaptive sports, few have discussed treatment. Dozono et al.[6] reported that changes in wrist and hand position were sufficient for the remission of symptoms. Finsen[22] questioned the high prevalence of the diagnosis and the need for treatment in patients diagnosed with CTS. In the present study, the prevalence of CTS in adaptive sport athletes was lower than that reported in the literature, and the patients rarely need treatment.

Conclusion

The prevalence of CTS in powerlifting athletes with disabilities is of 2 in 29 (7%).

Key Points

Findings: The prevalence of CTS in powerlifting athletes with disabilities is only of 2 in 29 (6,89%).

Implications: CTS may not be as frequent in disabled athletes as expected.

Care: Pain and tingling do not always correspond to CTS.

Conflict of Interests
The authors have no conflict of interests to declare.

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