

Dor no Paciente com Lesão Medular: Uma Revisão*

Pain in Patients with Spinal Cord Injury: A Review

Marcia de Miguel¹, Durval Campos Kraychete, TSA²

RESUMO

Miguel M, Kraychete DC - Dor no Paciente com Lesão Medular: Uma Revisão.

JUSTIFICATIVA E OBJETIVOS: A dor crônica após a lesão medular é uma condição clínica de alta prevalência e de difícil tratamento. Desse modo, é importante que se conheça suas características clínicas e fatores causais para melhor abordagem diagnóstica e terapêutica. O objetivo desse trabalho foi revisar a literatura sobre a dor no paciente com lesão medular e sua possível associação com fatores físicos (nível da lesão, grau da lesão, tempo de início de dor) e fatores psicológicos (humor e qualidade de vida).

CONTEÚDO: Foram pesquisados trabalhos na base de dados Medline, publicados nos últimos seis anos e os critérios de inclusão foram os estudos originais em maiores de 18 anos. Foram discutidas as características clínicas da dor no paciente com lesão medular, comparando casuística de diversos autores.

CONCLUSÕES: Apesar das diferenças conceituais e metodológicas entre os estudos, as prevalências de dor encontradas em pacientes com lesão medular foram altas, variando entre 64% e 82%. A dor neuropática ao nível da lesão tem início precoce (dias ou semanas) e aquela abaixo do nível da lesão aparece mais tardiamente (meses ou anos). Não há associação entre dor e integridade da lesão e a porcentagem de pacientes que referem dor intensa varia entre 21 e 39%. Não foi possível concluir qual a relação entre a dor e o nível da lesão medular. A dor, no entanto, pode interferir de forma negativa no humor, na capacidade de realizar atividades cognitivas, sociais, recreacionais e laborativas.

Unitermos: DOR, Crônica: lesão medular, qualidade de vida.

SUMMARY

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BACKGROUND AND METHODS: Chronic pain after spinal cord injury is a highly prevalent clinical condition, which is difficult to

treat. Therefore, it is important to know its clinical characteristics and causes for a better diagnostic and therapeutic approach. The objective of this study was to review the literature on pain in patients with spinal cord injury and the possible association with physical (level of the injury, completeness of lesion, pain duration) and psychological (mood and quality of life) factors.

CONTENTS: Original studies in the Medline database with patients older than 18 years and published over the last six years were reviewed. The clinical characteristics of pain in patients with spinal cord injury are discussed, and the works of several authors are compared.

CONCLUSIONS: Despite conceptual and methodological differences among the studies, the prevalence of pain in patients with spinal cord injury was high, varying from 64% to 82%. Neuropathic pain at the level of the injury has an early onset (days or weeks), while that below the level of the injury has a late onset (months or years). An association between pain and integrity of the lesion is not observed, and the percentage of patients who complain of severe pain varies from 21% to 39%. It was not possible to conclude which is the relationship between pain and level of spinal cord injury. However, pain can have a negative influence on mood and in the capacity to perform cognitive, social, recreational, and work-related activities.

Keywords: PAIN, Chronic: spinal cord injury, quality of life.

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1. Especialista em Dor - Universidade Salvador (UNIFACS); Farmacêutica Hospitalar - Rede SARAHA de Hospitais de Reabilitação
2. Doutorado em Medicina; Professor Adjunto da Faculdade de Medicina da Universidade Federal da Bahia (UFBA)

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Endereço para correspondência (**Correspondence to**)

Marcia de Miguel
Av. Tancredo Neves, 2782
Caminho das Árvores
41820-900 Salvador, BA
E-mail: marciademiguel @ sarah.br

***Pain in Patients with Spinal Cord Injury:
A Review***

Marcia de Miguel, M.D.; Durval Campos Kraychete, TSA, M.D.

INTRODUCTION

Spinal cord injury affects approximately 900 to 1,000 individuals in one million in the general population ¹ and, in the United States, it has an annual incidence of 11,000 new cases, totaling 183,000 to 230,000 individuals ². Young adults are at a higher risk of being affected by this type of injury ³. It has been described that pain is one of the most common problems affecting individuals with traumatic spinal cord injury ³. Although the loss of functionality is considered the most significant consequence of this type of lesion, pain can determine the ability or incapacity of the individual to fully return to his activities ⁴.

Despite the significant progress on understanding the pathophysiology and treatment of neuropathic pain, the approach of this symptom is still inadequate in individuals with spinal cord injury since data on the prevalence, cause, characteristics, and treatment are scarce in the literature ⁵.

Studies to estimate the prevalence and severity of pain in individuals with spinal cord injury show a great disparity in the data ^{1,5,6,9-11}. This variation can be explained by differences in definition, terminology, classification, inclusion criteria, variability of the notification methods used, as well as by etiological, demographic, and cultural factors ⁷. However, it is necessary to look for this information because this knowledge can offer support for more effective therapeutic strategies. Thus, studies published in the last six years on the prevalence of pain in patients with spinal cord injury, association with physical factors, and interference with activities of daily life were selected. All studies evaluated individuals older than 18 years and were original articles from the Medline database. The method used by each author was not an exclusion criterion because the material on the subject available in the literature is very heterogeneous.

To avoid wrong interpretations of the types of pain mentioned in this study, the concepts used are based on the definitions of Siddall et al. ⁸:

- a) Muscle-skeletal pain: caused by trauma or inflammation of bones, joints, or muscles, mechanical instability, muscle spasm, or syndrome secondary to excessive use.
- b) Neuropathic pain: after central or peripheral nervous system lesion and it can be subdivided in:
 - At the level of the injury: occurs at the level of the spinal cord injury and it can be attributed to a disorder in the nerve root or changes in the spinal cord itself, or in supra-spinal structures.
 - Below the level of the injury: presumed to be due to changes in the central nervous system that develop after spinal cord injury.
- c) Visceral: associated with visceral disorders and perceived in deep visceral structures.
- d) Others: complex regional pain syndromes types I and II, pain in the limbs associated with compressive mononeuropathies, and pain associated with syringomyelia.

REVIEW OF THE LITERATURE

Frequency

Several studies reporting the prevalence of pain in individuals with spinal cord injury can be found in the literature; however, results are often inconsistent and contradictory. As an example, we have the numbers mentioned by Ehde et al. ² in whose study the prevalence varies from 11% to 94% and 18% to 63% of the patients who reported severe and incapacitating pain. Despite differences in methods and concepts the prevalence found in the studies analyzed was high, ranging from 64% to 82% ^{1,5,9-11}, and prospective studies have shown an increase in the prevalence of pain five years after the spinal cord injury ^{5,9}.

Even studies with heterogeneous (patients with traumatic and non-traumatic spinal cord injuries) ¹ or non-representative samples ¹⁰, or even in those where only specific characteristics, such as chronic pain¹¹, were analyzed, it is possible to find a prevalence of pain around 79% among patients with spinal cord injury.

In more details, there are reports on the change in the prevalence of the different types of pain over five years after the injury in which muscle-skeletal pain was more frequent (59%), followed by neuropathic pain at the level of the injury (41%), neuropathic pain below the level of the lesion (34%), and visceral pain in only 5% of the patients. Allodynia was present in 14% of the individuals with neuropathic pain at the level of the injury ^{5,9}.

Looking for some type of comparison despite differences among the methods we found a study ¹⁰ that reported a higher frequency of pain below the level of the lesion (83.2%), followed by pain at the level of the lesion (50%) and above the lesion (41%); those proportions are also seen on the study of Siddall et al. ¹ (76%, 37%, and 14% respectively). Another study ¹¹ contained information on the descriptors used to report pain, and the most frequent include "burning" (59.9%) and "aching" (54.4%), which the author correlates with neuropathic and muscle-skeletal pain, respectively.

Onset of pain

Some studies focus on the onset of the different types of pain, providing very interesting data ^{5,9}. In a study that followed the same group of patients from two weeks to five years after the injury, the authors concluded that, in general, pain may begin immediately after the damage, but this does not exclude the possibility of a late manifestation, up to two years after the event ⁹. However, the same study reports that different types of pain present heterogeneously with time. Neuropathic pain at the level of the injury is the earlier to develop, with muscle-skeletal pain following the same pattern. Neuropathic pain below the lesion begins somewhat later, but visceral pain has the longer interval between the time of the injury and its presentation, and it is reported by a smaller number of patients (n = 6). Allodynia has an early presentation, but reduces dramatically in the first six months after the lesion. For both muscle-skeletal pain and neuropathic pain at the level of the injury, approximately half of the patients reported that the problem began in the first few months after the damage (54% and 46%, respectively). In contrast, neuropathic pain below the level of the injury and visceral pain began two or more years after the injury in most individuals (51% and 100%, respectively) ⁹.

Another study showed that most patients developed pain in the first year after the lesion (78%), especially in the first six months (63%), although it can also begin several years after the injury. A tendency for persistence of the pain was observed, and only a small proportion of the individuals reported spontaneous improvement (16%) ¹.

Some authors demonstrated that in 59% of the individuals the most bothersome pain began in the first semester after the injury, while 37% of the patients said the most severe pain began after this period ¹¹.

Another study did not mention in details the period after which the different types of pain began, but in general 82% of the individuals reported annoying, persistent pain at some time after the initial hospital discharge ¹⁰.

Severity

Siddall et al. followed 100 individuals for the first six months after spinal cord injury and observed that the percentage of patients who complained of severe pain decreased in the first eight weeks after the injury, but it increased after three and six months. Six months after the injury, 64% of the patients still complained of pain and 21% of those described it as severe. The relationship between the type of pain and severity was also evaluated in this study, and none of the individuals with visceral pain described it as severe or excruciating. In those patients with neuropathic pain at or below the level of the injury, 37% and 53% respectively used those descriptors ⁹.

In the sample analyzed by Winderström-Noga et al., 30% of the individuals classified their pain as severe and differences in severity among patients with cervical lesions and those with lower lesions were not identified ¹¹.

Relating the onset of pain with its severity at the time of evaluation, the same authors found a greater incidence of moderate pain, greater severity at the moment of worse pain, and greater intensity at the moment of greatest relief in those patients whose pain had an earlier onset after the spinal cord injury.

Von Korff et al. suggested that individuals with pain scores > 50 (on a scale from 0 to 100) had already experienced interference in their activities of daily life¹². In the study of Turner et al. with 384 patients, 36% presented scores ≥ 70 ¹⁰. In the study by Ravenscroft with 146 patients, 39% described the pain that began after the spinal cord injury as severe ¹.

Completeness of lesion

Although other studies indicate greater frequency of pain in individuals with incomplete lesions ¹³⁻¹⁷, the studies analyzed did not confirm this information ^{1,5,6,9-11}.

As for allodynia, some authors have reported a greater prevalence in individuals with incomplete lesions (33%) than in those with complete lesions (11%) in the first six months after the injury ⁵.

Level of the lesion

The association between the level of the lesion and the presence of pain is another parameter whose analysis is hindered by the heterogeneity of the studies. The prevalence of pain among cervical, thoracic, lumbar, and sacral injuries did not show statistically relevant differences according to a study with patients with lesions up to six months old ⁵. In this study, significantly greater differences were seen in

individuals with thoracic injury, who presented a higher incidence of muscle-skeletal pain (92%) when compared to the entire group (72%). Differences in the incidence of neuropathic pain among the different levels of injury were not observed. The prevalence of allodynia was higher in cervical lesions (39%) than in thoracic lesions (8%).

Follow-up of the patients of the prior study for five years reported an association between neuropathic pain below the level of the lesion and quadriplegia, and this type of pain was present in 50% of the patients with quadriplegia when compared to 18% of paraplegics ⁹. However, data from other authors do not corroborate those results. Turner et al. described a lower prevalence of neuropathic pain at the level of the injury in patients with lesions between C₁ and C₄ than in those with lesions between L₁ and S₄ or S₅, but they did not find any statistical correlation between the two parameters. Ravenscroft et al. did not confirm any kind of correlation between the level of the injury and the prevalence of pain and Widerström-Noga et al. described pain in the neck, shoulders, and upper limbs as more common in quadriplegic patients than in paraplegics (24.5% and 11.2%, respectively), but they did not find an association between the type of pain and the level of injury ¹¹.

Interference with activities

Siddall et al. tried to correlate pain with possible psychological factors and physical incapacity on a 5-year longitudinal study, obtaining surprising data. Pain was the third spinal cord injury-related difficulty mentioned more often, losing only for motor incapacity and sexual dysfunction, first and second most mentioned respectively ⁹. Patients with pain were also those who demonstrated greatest mood changes, according to the Distress Scale of Kessler and Mroczek ¹⁸ when compared with those without pain ⁹.

Using the Chronic Pain classification of Von Korff et al. ¹², Siddall et al. examined the relationship between pain severity and interference with activities of daily life, including work and social activities, and discovered that chronic pain originated incapacity in 28.7% of the patients, and 12.3% of these patients were classified as grade III (severe incapacity – moderately debilitating pain) and 16.4% as grade IV (highly incapacitating – severely incapacitating pain) ⁹.

Using the same instrument, Turner et al. found even higher numbers related with the incapacity secondary to chronic pain, with 17.7% of the patients classified as grade III and 22.0% as grade IV ¹⁰.

Widerström-Noga et al. brought additional information on the difficulties of individuals to handle pain secondary to spinal cord injuries ¹¹. To determine whether individuals who agreed to answer a questionnaire with detailed information on pain were the same who had more difficulties dealing with the problem, patients from a prior study were compared ¹⁸. The authors used a scale from 0 to 10 (0 = no difficulties and 10 = extreme difficulties) and the comparison demonstrated that individuals who agreed to answer the questionnaire had slightly higher difficulties dealing with this complication than

those who did not agree to participate in the study. Besides, the author found an association between higher pain severity and greater difficulty dealing with the problem, according to the reports of the patients. Among the patients who complained of pain, 50% classified it as their worse health problem, compared with 35% who had greater difficulty dealing with the paralysis ¹.

FINAL CONSIDERATIONS

Only two of the studies analyzed described the specific types of pain of patients with spinal cord injury ^{5,9}. Another study emphasized the areas affected by pain and only inferred on possible types of pain, stating that further investigation is necessary to determine causes of pain and the presence of a common pattern in this population ¹⁰. Similarly, Siddall et al. considered pain above, at, and below the level of the injury, while Widerström-Noga et al. ¹¹ differentiated the cases analyzed as neuropathic and nociceptive pain, making it impossible to compare their data.

Thus, one can conclude that the prevalence of pain, in general, is high in individuals with spinal cord injury and further investigation is necessary to compare the types of pain.

As for the onset of pain, Siddall et al. in their longitudinal study confirmed the results of other authors who suggest that neuropathic pain at the level of the injury begins a few days or weeks after the damage, while that below the level of the injury starts in months or years ⁹.

It is possible to compare the studies analyzed and conclude that pain that begin early after the injury was commonly described as more severe.

Comparison of the longitudinal data with other studies suggested an association among neuropathic pain at the level of the lesion, early onset, and the presence of severe pain a few years after the lesion, since neuropathic pain at the level of the injury is commonly characterized as persistent ⁹. However, further studies are needed to confirm this association.

Although three of the studies reviewed confirmed neuropathic pain as the most common among patients with spinal cord injury, the individuals included in those studies presented lesions of different ages (between two months and 38 years ¹, eight months and 53.8 years ¹⁰, and 3.1 and 13.3 years ¹¹). Siddall et al. give a broader idea on the evolution of the prevalence of the different types of pain with time, which is relevant when one thinks about rehabilitation, since the combination of both parameters (time of onset and prevalence) may help to uncover the mechanisms involved in pain after spinal cord injury and to find more effective responses to proposed treatments ⁹.

The association between completeness of lesion and pain was not confirmed by any of the studies analyzed, except in the longitudinal study of Siddall et al., who referred greater incidence of allodynia in patients with incomplete lesions ⁹. This result may be associated with the failure of inhibitory circuits at the level of the injury ²⁰⁻²².

Frequently, the impressions obtained from clinical practice on the direct relationship between pain and poor quality of life cannot be confirmed by controlled studies. However, even considering those difficulties, all studies analyzed demonstrated that pain can interfere negatively in the quality of life of patients with spinal cord injury, changing their mood, self-perception of the difficulties in dealing with problems caused by the injury, and collaborate for the development of disabilities ^{1,5,9-11}.

The great difficulty to deal with pain after spinal cord injury brings professionals to the challenge of the multimodal approach and the search for more effective treatments.

All the difficulties faced to compare the studies selected demonstrate the urging need to harmonize terminology, classification, and concepts used in studies with patients with spinal injuries and pain. Only then clear and objective knowledge to help the development of better treatment alternatives will be produced.

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RESUMEN

Miguel M, Kraychete DC - Dolor en el Paciente con Lesión Medular: Una Revisión.

JUSTIFICATIVA Y OBJETIVOS: El dolor crónico después de la lesión medular es una condición clínica de alta prevalencia y de difícil tratamiento. De ese modo, es importante que se conozcan sus características clínicas y los factores causales para un mejor abordaje diagnóstico y terapéutico. El objetivo de este trabajo, fue revisar la literatura sobre el dolor en el paciente con lesión medular y su posible asociación con factores físicos (nivel de la lesión, grau de la lesión, tiempo de inicio del dolor) y factores psicológicos (humor y calidad de vida).

CONTENIDO: Fueron investigados trabajos en una base de datos Medline, publicados en los últimos seis años y los criterios de inclusión fueron los estudios originales en mayores de 18 años. Fueron discutidas las características clínicas del dolor en el paciente con lesión medular, comparando la casuística de diversos autores.

CONCLUSIONES: A pesar de las diferencias conceptuales y metodológicas entre los estudios, las prevalencias de dolor encontradas en pacientes con lesión medular fueron altas, variando entre un 64% y un 82%. El dolor neuropático al nivel de la lesión tiene un inicio precoz (días o semanas) y el que surge por debajo del nivel de la lesión, aparece más tarde (meses o años). No existe una asociación entre dolor e grau de la lesión, y el porcentaje de pacientes que relatan dolor intenso, varía entre un 21% y un 39%. No se pudo concluir cuál es la relación entre el dolor y el nivel de la lesión medular. Sin embargo, el dolor puede interferir de forma negativa en el humor, en la capacidad de realizar actividades cognitivas, sociales, de ocio y de trabajo.