02 - APPLICATION OF LASERTHERAPY IN PRESSURE ULCER IN PATIENTS WITH SPINAL CORD INJURY - A CASE REPORT

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INTRODUCTION

Spinal cord injury is an insult the spinal cord due to trauma or illness that may result in changes in motor functions, sensory and autonomous. The spinal cord injury can mean loss of voluntary movement and or sensitivity (tactile, painful and deep) at the level of the upper and/or lower limbs and changes in the functioningof various body systems. (BAMPI, 2007)

A spinal cord injury is one of the most serious complications causing disability in humans, itscause's failure of a number of vital functions such as locomotion, sensitivity, sexuality, urinary and intestinal system, and the autonomic nervous system (SALVADOR & TARNHOVI, 2004).

Thus patients with spinal cord injury (SCI) present a high risk of developing PU, because changes in mobility and sensitivity. (JOPPERT, 2011). A pressure ulcer (PU) is a term assigned to wounds that result from prolonged pressure on the soft tissue in any area of the body, especially in areas of bony prominences. The PU cause a negative impact on quality of life of these patients, since affect physical, psychological and socially, besides resulting in delay or interruption of rehabilitation andconsequent delayed social reintegration. (ASSIS, 2013). Additional factors involved acceleration of wound healing with laser may include a marked increase in collagen formation, vasodilation, DNA synthesis and increased production of RNA. The laser treatment is recommended for indolent wounds and trophic ulcers to promote faster healing, and it is considered that the low-intensity visible radiationhave an effect in accelerating or stimulation cell proliferation. In certain wounds cell proliferation can be inhibited by a low concentration of oxygen, anormal pH or other anormalities as nutrient deficiency. In these circumstances a light can act as a signal to increase proliferation. (LOE & REED, 2001)

Facts such as high morbidity, the high cost of treatment and the large negative impact the welfare of the subject which presents pressure ulcer justifies the need for greater attention of researchers in producing studies to optimize techniques for wound healing. (JOPPERT & BASTOS 2011).In view of that treatment with laser says is effective in wound healing then traced aim of this study verify the effectiveness of lasertherapy in the treatment of pressure ulcers.

CASE REPORT

This is a case report of a patient of 46 years old, male, with diagnosed complete spinal cord injury at the level of T7 for 11 years ago, presenting as physicaltherapy diagnosis spastic paraplegia and pressure ulcer classified as grade I in left knee, acquired due to fall, becoming chronic the habit of sleeping in the prone position, for approximately two years and seven months. Has a character exploratory and descriptive, due to the use of intensive and direct observation of the patient.

The lasertherapy is the therapeutiecresourc chosen to lead the healing process of PU of the patient.

Laser applications were performed by a single professional in two weekly sessions, totaling sixteen appointments, including assessments, on the premises and FAG Rehabilitation Center - GurgaczAssis School.

The procedures for data collection were: initial assessment through the anamnesis and inspection, the apparatus used was the LLT Laser trademark KLD, with wavelength 660 nm, with measurement protocol with the PU in cm² x dose (6 J/cm²) where the apparatus calculated the time of application irradiation of the wound without contact (scanning) to 0.5 cm away from the lesion, with the patient positioned supine, and removed from the dressing, aseptic PU to start application. Each treatment then recorded, the picture size, depth, granulation tissue and/or epithelization, staining of the ulcer and measuring through millimeter ruler the ulcer size. The photographic records were taken by a camera Samsung® brand. After the procedure the dressing was replaced.

The study began only after the granting and approval of the subject involved in the research by theFree and Clarifield Consent Term, (FCCT), during the course of the research was essential care with ethical observances.

RESULTS

In the first evaluation it was observed that the ulcer presented with size 9,5cm² absence granulation or epithelialization tissue, the color is red showed up, with fetid odor when removing the dressing. In the fifth session presented 8,5cm² with increasing granulation tissue at the edges. In the tenth session presented 6,5cm² with granulation tissue from the wound edge to the center. In the sixteenth session the ulcer presented 1 cm² with normal coloration, epithelialization and granulation tissue and showing no foul odor.

A pressure ulcer treated in which case through LLT Laser, 660 nm with dose of 6J/cm², obtained 89.47% healing after application of 16 sessions as the results below.

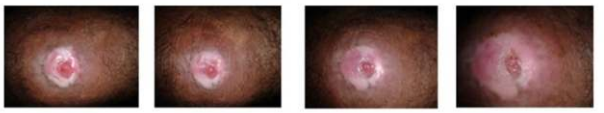
Table I: Results obtained from a plenary session

Treatment	Date	Lesion Size
1	13/06/2014	9,5 cm²
2	16/06/2014	9,5 cm²
3	23/06/2014	9,0 cm²
4	27/06/2014	9,0 cm²
5	30/06/2014	8,5 cm²
6	03/07/2014	8,2 cm²
7	04/07/2014	8,0 cm²
8	11/07/2014	7,5 cm²
9	15/07/2014	7,0 cm²
10	17/07/2014	6,5 cm²
11	22/07/2014	6,0 cm²
12	24/07/2014	5,1 cm²
13	29/07/2014	4,0 cm²
14	31/07/2014	2,0 cm²
15	05/08/2014	1,5 cm²
16	07/08/2014	1 cm²

The data were tested for normality of distribution using the Shapiro-Wilk test, and according to the distribution doesn't meet the assumptions, data were presented as medians and quartiles and others using descriptive statistics.

After completion of treatment, the wound did from 9.5 cm2 to 1 cm2,presenting median of evolution of 7.25 cm2 and respective quartiles of 4.27 cm2 and 8.87 cm2 (25 and 75%). The reduction was 8.5 cm2, totaling a percentage of improvement of 89.47% when compared to the first day.

Table II: Macroscopic result evidencing the progressive improvement of the lesion



1° session | 5° session | 10° session | 16° session

DISCUSSION

The present study brought as a problem verify the application of lasertherapy is effective in healing of pressure ulcers, revealing that using LLT laser, 660 nm with dose of 6J / cm², was effective in the healing of pressure ulcers.

Nascimento and Meija (2010) in a literature review, concluded that has confirmed the effect of the use of low power laser in the treatment of pressure ulcers with respect to the acceleration of the healing process.

Stefanello&Hamerski (2006) in a case study demonstrated that the effect of laser irradiation with a wavelength of 904 nm, 6 J / cm², 45 mW, twice a week for seven weeks, the healing process of pressure ulcers located in the calcaneus for three months ago there was complete healing, suggesting that therapy for low-power laser, accelerates the healing of the ulcer, which is consistent with this study regarding the dose used, where it was observed that there was accelerated healing in both cases. The wavelength was not equal in these studies and two sessions were held less, unless wherein the author cites the ulcer had three months of injury, making it less chronic thaninjury presented in this study.

In the present study used the dose of 6 J/cm², with radiation to the wound with the scanning technique, sixteen sessions treatment twice a week, being performed, it's possible to verify the effectiveness of Laser with physicaltherapy resource on healing of pressure ulcers.

Afonso (2011) in a study conducted by bibliographic research, concluded that the laser decreases the healing time by improving the histological part due to the organization of the fibers and decreases pain and is thus a method to help prevent infection, since the lesions open become a gateway for microorganisms, showing that physiotherapy has resources that help treateffectively a lesion of the patient, minimizing the suffering that the disease can cause.

Assisi and Moser (2013) in uncontrolled clinical trial, withsix patientspinal cord injury amounting twelve pressure ulcers where each patient possessed at least two ulcers, therefore an ulcer was treated and the other was not, used laser diode 830 nm with a wavelength of 10 mW output power, a dose of 4 J/cm², continuous emission, punctual technique, 45s by point, with a distance of 1 cm between points. It was impossible to observe responses in PU in this study by prevailing limitations, the difficulty of compliance the frequent practice of pressure relief and treatment non-prioritization of PUs, leading to frequent missed appointments for several reasons. Less frequent limitations, but no less important, were the installation of infectious conditions and the difficulty with independent locomotion.

Jacinto and Mota et al., (2011) conducted a case study of a victim with severe spinal cord injury, presenting pressure ulcers in the sacral region. The laser treatment was performed with AS-GA 904 laser nm with energy density of 0.3 J/cm² punctually at the edges of the wound. This protocol was performed three times a week for one month. In the second month of treatment, was modified for the energy density 0.5 J/cm² aiming to further accelerate the healing process. The whole treatment lasted three months. In the first evaluation the ulcer had moist aspect with exudate, necrotic tissue, foul odor, no evidence of healing. Presented five centimeters deep, seven centimetersin length and five centimeters wide. In the tenth session have been observed drier and defined edges, reduced exudation, no foul odor and necrosis and incresead granulation tissue. In the 33th session, the wound was completely healed. To conclude the use of lasertherapy given as treatment protocol showed positive effects, accelerating tissue proliferation, increasing local vascularization and forming a more organized granulation tissue, promoting rapid healing. The author cites the above dose of 3 J/cm² after changed to 5 J/cm², 33 sessions were required for ulcer healing, the present study corroborates the authors cited above, as ulcer healing, but no difference in dose used, in number of sessions and the characteristic of the ulcer which is an important aspect when compares studies.

Joppert and Bastos et al., (2011) developed a descriptive and observational study that followed the contraction of wounds in a treatment proposal for closing PU (Pressure Ulcer) in patients with SCI (Spinal Cord Injury). Used the apparatus of LaserpulseIbramed S/A to administer a continuous emission lightradiation with red HeNe laser, with a wavelength of 660 nm (nanometers). With dose of 6 joules/cm2, deposited using the spot technique. Patient Aachived total closure of PU the sacrallevel II, area of 5.16 cm² in 43 days. Patient B showed a negative rate of wound contraction. Measuring 1.61 initially and 1.63 cm² cm² at the end of the program (this was the only case where there was a worsening of PU). In the analysis of patient C it was observed that it appeared to 12 sessions and mixed six, in 36 consecutive days. Initially PU with a 0.93 cm² in the medial region of the metatarsophalangeal joint of the hallux, the study showed a contraction of 0.67 cm² wound. Patient D, showed that it appeared 12 sessions for 35 days. His wound contracted 0.96 cm² of 1.92 cm² initial and evolutionary analysis of the last patient (E) revealed that it achieved total closure of PU grade II ischial 2.03 cm² in 47 days. It's concluded that the protocol applied was effective when followed correctly, since in both cases was complete ulcer closure. The author above has used in his study the same dose and wavelength used in this study, confirming the positive effects of the application of lasertherapy on pressure ulcers, is important for the healing of the ulcer, patient collaboration as to attendance at sessions and ulcer care.

According to Felice and Pinheiro et al., (2009) in a case study with three patients underwent application of low intensity laser with a dose of 4 J / cm². Concluded that all cases showed significant improvement of the processes of tissue repair, having been one of complete healing of the ulcer, which is in agreement with literature data, we affirm the positive effects of laser on tissue healing, concluding that treatment with laser ulcer was effective.

Silvestre and Holsbach (2012) then found the following results with respect to prevention 23 references were found, pointed up the physiotherapy treatment facing pressure ulcers focusing electrotermphototherapyresources.We found 24 references that discuss treatment physicaltherapy for pressure ulcers and that lasertherapythe feature was present in 20 most cited references. Completing the effectiveness of various features of physicaltherapy used in the treatment of pressure ulcers.

Should be considered satisfactory results found in this study with laser LLT 660 nm with dose of 6J /cm², used scanning manner. There ins't a protocol regarding dose, wavelength and type of laser is more effective in the healing of pressure ulcers, studies are still controversial about these findings. It's then necessary to further study in this direction with a greater number of patients in order to verify the proposed method is statistically relevant.

CONCLUSION

Was observed through this study that the use of laser in the treatment of pressure ulcers is effective, which is

consistent with the literature discussed. There is controversy regarding the dose, wavelength and technique spot or scanning to be used, the new studies is needed to compare between the dose and the most effective technique in the treatment of pressure ulcers.

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APPLICATION OF LASERTHERAPY IN PRESSURE ULCER IN PATIENTS WITH SPINAL CORD INJURY - A CASE REPORT.

ABSTRACT

Introduction:Spinal cord injury (SCI) is an insult the spinal cord due to trauma or illness that may result in changes in the transmission of nerve impulses, motor and sensory, and plus modifications autonomic generating intense economic conflict and social for the patient, family and society . Thus patients with SCIhave a high risk for developing pressure ulcers (PU). The PU is an injury resulting from prolonged pressure on soft tissue in any area of the body. Lasertherapy as a therapeutic resource has the primary objective promote accelerate and proliferation cell by low-intensity visible radiation. Aim: This case report is exploratory and descriptive with aim is verify the effectiveness of lasertherapy in the treatment of pressure ulcers. Methodology: Participated in this study a patient victim of SCI, currently followed in the FAG rehabilitation center which had a pressure ulcer on his left knee. Sixteen applications of lasertherapy were performed, twice weekly, with a dose of 6 J/cm², scanning, without contact with the ulcer to 0.5cm away. At the end of the application was done photographic recording and measuring the ulcer using a millimeter ruler. Results: It was found that lasertherapy was effective in the healing process, reducing 89.47% of PU. Conclusion: It was possible to verify that the application of lasertherapy as well favors more rapid healing of the ulcer.

KEYWORDS: Spinal Cord Injury, pressure ulcers, lasertherapy.

APPLICATION DE LA THERAPIE LASER EN ESCARRE CHEZ LES PATIENTS ATTEINTS SPINAL CORD INJURY – UNE ÉTUDE DE CAS.

RÉSUMÉ

Présentation: Lésions de la moelle épinière (SCI) est une insulte à la moelle épinière due à une blessure ou une maladie qui peut entraîner des changements dans la transmission de nerf, moteur et impulsions sensorielles et changements autonomes origine du conflit économique et sociale intense pour le patient, la famille et société. Ainsi patients blessés médullaires sont à haut risque de développer des ulcères de pression (PU). UP est un dommage résultant de pression prolongée sur les tissus mous dans n'importe quelle zone du corps. La thérapie au laser comme une ressource thérapeutique a pour objectif premier de promouvoir et d'accélérer la prolifération cellulaire par une faible intensité du rayonnement visible. Objectif: Cette étude de cas est exploratoire et descriptive afin de vérifier l'efficacité de la thérapie au laser dans le traitement des ulcères de pression. Méthodologie: Participé à cette étude, un patient victime de LM actuellement suivi dans le FAG centre de réadaptation qui a eu un ulcère de pression sur son genou gauche. Seize applications de la thérapie au laser deux fois par semaine à la dose de 6 J / cm ², la numérisation, sans contact avec l'ulcère 0,5 cm ont été emportés. A la fin de l'application a été réalisée enregistrement photographique et la mesure de l'ulcère par millimètre règle. Résultats: Il a été constaté que le traitement par laser est efficace pour le processus de cicatrisation, réduisant de 89,47% UP. Conclusion: Il a été possible de vérifier que l'application de la thérapie au laser favorise ainsi la cicatrisation plus rapide de la plaie.

MOTS CLÉS: épinière, ulcère de pression, la thérapie au laser

SOLICITUD DE LASER TERAPIA EN DE ÚLCERAS POR PRESIÓN EN PACIENTES CON LESIÓN DE LA MÉDULA ESPINAL - PRESENTACIÓN DE UN CASO.

RESUMEN

Introducción: Lesión de la médula espinal (SCI) es un insulto a la médula espinal debido a una lesión o enfermedad que puede resultar en cambios en la transmisión de los nervios, el motor y los impulsos sensitivos, y cambios autonómicos que generan un intenso conflicto económico y social para el paciente, la familia y la sociedad . Así, los pacientes con SCI tienen un alto riesgo de desarrollar úlceras por presión (UPP). UP es una lesión que resulta de la presión prolongada sobre los tejidos blandos en cualquier área del cuerpo. La terapia con láser como recurso terapéutico tiene el objetivo primordial de promover y acelerar la proliferación de las células por la radiación visible de baja intensidad. Objetivo: Este caso es exploratorio y descriptivo con el fin de verificar la eficacia de la terapia con láser en el tratamiento de las úlceras por presión. Metodología: Participaron en

este estudio un paciente víctima de LM actualmente seguido en la FAG centro de rehabilitación que tenía una úlcera por presión en la rodilla izquierda. Dieciséis aplicaciones de la terapia con láser dos veces por semana a una dosis de 6 J / cm ², de exploración, sin contacto con la úlcera de 0,5 cm fueron llevados. Al final de la aplicación se llevó a cabo registro fotográfico y la medición de la úlcera a través regla milimetrada. Resultados: Se encontró que la terapia con láser fue eficaz en el proceso de curación, la reducción de 89,47% de UP. Conclusión: Se pudo comprobar que la aplicación de la terapia con láser, así favorece más rápida cicatrización de la úlcera.

PALABRAS CLAVE: Cord Injury, úlceras por presión, la terapia con laser

APLICAÇÃO DE LASERTERAPIA EM ÚLCERA DE PRESSÃO EM PACIENTES COM LESÃO MEDULAR – UM RELATO DE CASO.

RESUMO

Introdução. A lesão medular (LM) é uma agressão a medula espinhal decorrente de um traumatismo ou doença que pode resultar em alterações na transmissão dos impulsos nervosos, motores e sensoriais, além de modificações autonômicas gerando intenso conflito econômico e social para o paciente, família e sociedade. Dessa forma pacientes com LM apresentam um risco elevado para desenvolver úlcera de pressão (UP). A UP é uma lesão que resulta de pressão prolongada sobre os tecidos moles em qualquer área do corpo. A laserterapia como recurso terapêutico tem como objetivo primário promover aceleração e proliferação celular através da radiação visível de baixa intensidade. Objetivo. Este relato de caso é de caráter exploratório e descritivo com objetivo de verificar a eficácia da laserterapia no tratamento da úlcera de pressão. Metodologia. Participou deste estudo um paciente vítima de LM atualmente acompanhado no centro de reabilitação FAG que apresentava úlcera de pressão em joelho esquerdo. Foram realizadas dezesseis aplicações de laserterapia, duas vezes por semana com dose de 6 J/cm², varredura, sem contato com a úlcera a 0,5cm de distância. Ao final da aplicação era realizado registro fotográfico e medição da úlcera através de régua milimetrada. Resultados. Constatou-se que a laserterapia foi eficaz no processo de cicatrização, reduzindo 89,47% da UP. Conclusão. Foi possível verificar que a aplicação de laserterapia favorece assim uma cicatrização mais rápida da úlcera.

PALAVRAS-CHAVE: Lesão Medular, úlcera de pressão, laserterapia