24 - EFFECT OF MANUAL THERAPY TECHNIQUES AND PAIN ON RANGE OF MOTION IN THE CERVICAL REGION

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INTRODUCTION

Neck pain is one of the most common musculoskeletal disorders and is considered a major cause of difficulties in activities of daily living and also one of the biggest complaints made by individuals, affecting their quality of life (Salo et al., 2010).

Approximately two thirds of the population presents at least one episode of neck pain during their lifetime. The prevalence is generally about two times higher in women than in men (GROENEWEG et al., 2010).

The muscles of the neck have the function of balancing the head and suspend the thoracic spine and shoulder girdle. As a result, occur imbalances, shortening, contractures and painful downturns. The occurrence of muscle pain in the neck is very common, mainly because there is a connection with the fibrous tract that connect the spinous processes to the posterior cervical ligament. There is also the existence of numerous nerve filaments passing through the muscles of the neck (BIENFAIT, 1997).

According to Salo et al. (2010), neck pain is related to a decrease in muscle strength in the neck.

According Groeneweg et al. (2010), pain in the neck can be caused by infections, trauma such as traffic accidents, tumors, birth defects and inflammation, however, in many cases it is not possible to determine the cause, and then the neck is termed as non-specific.

Neck pain can be classified in to acute and chronic. If neck pain remain for six months or more is considered chronic if has shorter duration, it is acute disease (GROENEWEG et al., 2010).

Manual therapy can be defined as the use of manipulation for therapeutic purposes, through the use of hands. There are several manual therapy techniques, they operate on the physiological mechanisms, to accentuate the local tissue organization, the neurological or psychophysiological organization (Lederman, 2001).

The muscle techniques provide mechanical and reflexes effects. The mechanical effects are caused by physical manipulation of tissues, including the movements of fluids, heat, compression, stretching and enlargement of muscle fibers. The reflex effects come from the central nervous system responses to the manipulation of tissues, and lead to increased blood circulation and lymph, the generalized relaxation, decreased heart rate, reduction of emotional stress and increased immune response (DIXON, 2007).

According to Lederman (2001), the tissues are affected by manipulating the muscles, ligaments, tendons, joint capsules, joint faces, skin and fascia - this set is called the soft tissues. The use of this therapeutic modality provides change in the structure of these tissues, and normalizing stretching shortened tissues and thus, there is improvement in joint range of motion and reduction of abnormal tension in the body.

The muscle tissue is inseparable of conjunctive tissue. Thus, the massage that affects one affects the other tissues as a consequence (DIXON, 2007).

The responses of the central nervous system techniques also include muscle pain relief and muscle relaxation which is caused by changes in the function of the drive motor and sensory receptors similar to Golgi tendon organs and muscle spindle (DIXON, 2007).

The aimed of this study is to verify the effect of 10 session of manual therapy in the treatment of soft tissue neck, with regard to pain relief and increased range of motion in young adults who have any pain or discomfort nonspecific cervical origin.

METHODOLOGY (MATERIALS AND METHODS)

This study is classified as a clinical trial, non-randomized, non-use of control measures. It was initially submitted and approved by the Ethics in Research Involving Human Subjects at the State University of West Paraná (UNIOESTE) by the opinion number 056/2011 - CEP.

The sample was comprised of 10 volunteers, aged between 34 and 53 years, who complained of pain or discomfort in the neck. The inclusion criteria were willingness to participate in the evaluation and treatment in the days and times pre-determined. Were not included in the sample: individuals who were doing any kind of medical treatment or physical therapy simultaneously, individuals who have already undergone surgical treatment due to the neck, as well as patients with associated diseases such as ankylosing spondylitis, rheumatoid arthritis, fibromyalgia, fractures in the cervical region or that make use of anti-inflammatory drugs.

After the formal invitation and be clear about the objectives and procedures of the study, subjects underwent an evaluation to identify possible factors not included. Having accepted the invitation and found the eligibility for the study,provided written consent. Then, we carried out the treatment protocol for just one therapist, for a period of ten sessions.

To perform the measurement of the level of pain, we used the Visual Analogue Pain Scale (VAS), consisting of a straight 10 cm, with markers at their ends, where zero corresponds to no pain and ten corresponds to the maximum of existing pain (TEIXEIRA e FIGUEIRA, 2001). The patient was instructed to report the amount of pain in the currently displayed. Later, the therapist made use of a ruler to get the numerical answer marked by patient pain. In all cases, the assessment was conducted and the degree of pain reported by patients before and after the intervention of that session.

For the realization of the measure range of motion, we used a Fleximeter of Sanny ®, which consists in an inclinometer gravity-dependent, whose scale is of a degree, attached to a velcro strip. At the end of each movement, the device was repositioned. At the time of evaluation, the volunteers remained seated with feet flat on the floor, knees and ankles at 90° of flexion, and were instructed to place their hands on your thighs and stay in a relaxed position, which was considered the starting position. The flexion, extension, lateral tilt to the right and left were measured once. This procedure was performed before the first intervention and repeated in the and of tenth session.

To perform manual cervical traction, the patient was positioned supine with the therapist positioned behind his head, performing a cranial traction on for 20 seconds, repeating 5 times.

The stretching technique was performed by a traction-type intermittent muscle in each segment, and repeated three times and maintained for 20 seconds, from the following positions: a) the stretching of the sternocleidomastoid muscle occurred from extension movements , tilt and rotation associated with the neck to the opposite side to be treated, b) for the stretching of the scalene muscle, was also palpated the first rib, immobilizing it with one hand while the other performed intermittent cervical traction force; c) for the stretching of the levator scapulae, one hand set the insertion of the muscle and the other performed intermittent cervical traction force, d) for the stretching of upper trapezius, middle and inferior, with a hand therapist developed force cervical traction and with the other hand depressed the ipsilateral shoulder intermittently.

Techniques were also made of the release trigger points found in the cervical region by means of palpation of myofascial a band that had identifying tense and tender lumps in the region where the pain is recognized by the patient. The pain may or may not extend over the entire range tense, and may be caused during the compression of the trigger point. For treatment, the therapist used a finger to make a firm pressure on the trigger point toward the center, when the point was lost resistance, there was more pressure to find new strength, repeating this until is not possible to find more another resistance (KOSTOPOULOS, RIZOPOULOS, 2007).

The maneuver of mobilization of the cervical segment was performed with the patient in supine, with the therapist behind the patient's head with the fingers over the region of the transverse processes of cervical vertebrae in a straight alternating oscillation toward the ceiling throughout the path of the cervical spine.

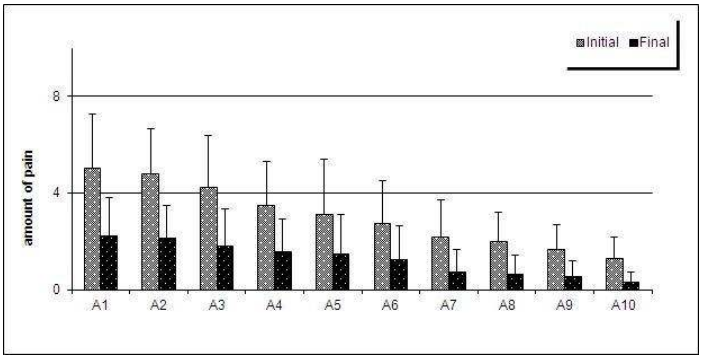
For statistical evaluation, we applied the test Test T Paried after collecting data from all services performed, and the level of significance was $p < 0.05$.

RESULTS

As for the analysis of pain by visual analog scale, patients had an average score of 5.04 before the first session and 0.3 at the end of last session, with significant results in decreasing pain ($p = 0.007$). The results began to show significant from the fourth treatment ($p = 0.041$), as shown in chart 1.

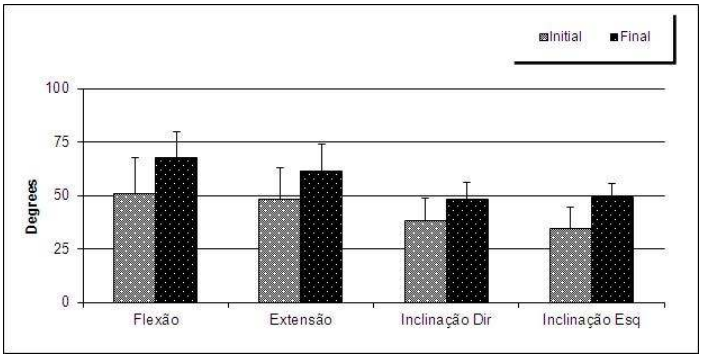
Regarding the increased range of motion, significant results were obtained for flexion ($p = 0,001$), extension ($p = 0,027$), lateral tilt to the right ($p = 0,015$) and lateral tilt to the left ($p = 0,002$), as displayed in Figure 2.

Chart 1: Average range of motion at the beginning and after 10 session Average pain at the beginning and end of each session, the EVA.



Regarding the increased range of motion, significant results were obtained for flexion ($p = 0,001$), extension ($p = 0,027$), lateral tilt to the right ($p = 0,015$) and lateral tilt to the left ($p = 0,002$), as displayed in Figure 2.

Chart 2: Average range of motion at the beginning and after 10 session



DISCUSSION

How neck pain is very common, the proposed new treatment techniques is important to determine conduct more effective and faster. Manual therapy has many techniques that can contribute to muscle relaxation and stretching muscle, nerve decompression and consequent relief of symptoms.

In this study, we obtained results that show that manual therapy techniques employed were significantly effective in neck pain and discomfort reducing. Furthermore, these techniques proved equally effective in increasing range of motion of the cervical spine.

Hoving et al. (2002) concluded in their study that the treatment for neck pain for six weeks with manual therapy techniques, especially mobilization, is significantly more effective in reducing pain and more satisfying to the patient than the continued use of general care, including analgesics, counseling and patient education. However, when compared with

conventional physiotherapy, manual therapy was not statistically significant.

In contrast, the results found by Aure, Vasseljen and Nilsen (2003) suggest that manual therapy was more effective than therapeutic exercises to increase range of motion and decreased pain in patients with chronic low back pain.

Also concur with the findings of this study, Vernon and Humphreys (2008), using the visual analog scale for measuring pain, found that the technique of vertebral mobilization and ischemic compression technique (trigger points) showed statistically significant results in relief pain.

Cunha et al. (2008) compared conventional static stretching associated with manual therapy and the technique of global posture reeducation also associated with the use of manual therapy in women between 35 and 60 years old who had chronic neck pain, concluding that the two associated with manual therapy techniques are very effective for reducing pain and increasing cervical range of motion, which highlights the positive results obtained by use of manual techniques for women in the age group studied.

The study by Briem, Thorsteinsdottir and Huijbregts (2007) found similar results with this technique after the inhibition of subocipital, which occurred after a session increased range of cervical flexion. The authors pointed to the factor of learning as a possible cause of the large increase in amplitude in relation to the first evaluation. This factor does not seem to affect the results of this study, since the reassessment occurred after the tenth treatment session.

The manual cervical traction was studied by Souza et al. (2008), according to whom this technique causes root decompression, increased intervertebral spaces and muscular relaxation which increases the length of the cervical spine between C2 and C7.

The results of this research are supported by the findings of Ranley et al. (2009), which also confirmed the efficacy of cervical traction along with strengthening exercises for patients with neck pain, resulting in decreased pain and muscle tension in the region of the C4 and C7. This explains in part the increased range of motion and reduced pain caused by manual therapy techniques.

For this study we used a visual analogue scale in the evaluation of neck pain. For Serrano (2002), the visual analogue scale of pain, even when assessing one-dimensional painful feeling, is a commonly used method to make more objective description of the pain. Studies by Caraviello et al. (2005), Morelli and Rebelatto (2007), Nohama and Silverio-Lopes (2009) was also used visual analog scale for pain assessment in the participants.

Florencio et al. (2010) conducted a study comparing the use of the Fleximeter for Cervical Range of Motion (CROM) to assess the reliability analysis of cervical range of motion. It was concluded that the values obtained with the Fleximeter and the CROM method agree with each other and that both tools are clinically reliable.

CONCLUDING REMARKS

With this study, we conclude that the use of these techniques for soft tissue manual therapy was effective in reducing pain and increasing range of movement of young adults who have any neck pain or discomfort.

REFERÊNCIAS

AURE, OlavFrode; NILSEN, JensHoel.; VASSELJEN, Ottar.Manual therapy and exercise therapy in patients with chronic low back pain a randomized, controlled trial with 1-year follow-up. **Spine**, v. 28, n. 6, p. 525-532, 2003.

BIENFAIT, Marcel. **Bases elementares Técnicas de Terapia Manual e Osteopatia**. São Paulo: Summus, 1997.

BRIEM, Ksistín;HUIJBREGTS Peter;THORSTEINSDOTTIR, Maria. Immediate effects of inhibitive distraction on active range of cervical flexion in patients with neck pain: a pilot study. **The Journal of Manual & Manipulative Therapy,v**. 15, n. 2, p. 82-92, 2007.

CARAVIELLO, ElianaZeraibet al. Avaliação da dor e função de pacientes com lombalgia tratados com um programa de Escola de Coluna.**Acta Fisiátrica**, v. 12, n. 1, p. 11-14, 2005.

CUNHA, Ana Claudia Violinoet al. Effect of global posture reeducation and of static stretching on pain, range of motion, and quality of life in women with chronic neck pain: a randomized clinical trial. **Clinics**, v. 63, n. 6, p. 763-770, 2008.

DIXON, Marian. Wolf. **Massagem Miofascial**. Rio de Janeiro: Guanabara Koogan, 2007.

FLORÊNCIO, Lidiane L. et al. Concordância e confiabilidade de dois métodos não-invasivos para a avaliação da amplitude de movimento cervical em adultos jovens. **Revista Brasileira de Fisioterapia**, v. 14, n. 2, 2010.

GROENEWEG, Ruudet al. The effectiveness and cost-evaluation of manual therapy and physical therapy in patients with sub-acute and chronic non specific neck pain. Rationale and design of a Randomized Controlled Trial (RCT).**BMC Musculoeskeletal Disorders**, v. 14,n. 11, 2010.

HOVING,Jan Lucas et al. Manual therapy, physical therapy, or continued care by a general practitioner for patients with neck pain. A randomized, controlled trial.**Annals of Internal Medicine**, v. 136, n.10, p. 713-722, 2002.

KOSTOPOULOS, Dimitrius; RIZOPOULOS, Konstantine. **Pontos-Gatilhos Miofasciais: teoria, diagnóstico, tratamento.** Rio de Janeiro: Guanabara Koogan, 2007.

LEDERMAN, Eyal. **Fundamentos da terapia manual – fisiologia, neurologia e psicologia.**São Paulo: Manole, 2001.

MORELLI, J. G. S.; REBELATTO, José. Rubens. A eficácia da terapia manual em indivíduos cefaleicos portadores e não-portadores de degeneração cervical: análise de seis casos. **Revista brasileira de Fisioterapia**, v. 11, n. 4, p. 325-329, 2007.

NOHAMA, P.; SILVÉRIO-LOPES, Sandra Mara. Influência da frequência estimulatória envolvida nos efeitos analgésicos induzidos por eletroacupuntura em cervicalgia tensional. **Revista Brasileira de Fisioterapia**, v. 13, n. 2, 2009.

RANLEY, Nicole H. et al. Development of a clinical prediction rule to identify patients with neck pain likely to benefit from cervical traction and exercise.**European Spine Journal**,n. 18, p. 382-391, 2009.

SALO, Petri K. et al. Effect of neck strength training on health-related quality of life in females with chronic neck pain: a randomized controlled 1-year follow-up study. **Health andQualityof Life Outcomes,**n. 8, v. 48, 2010.

SERRANO, S. C. A importância da mensuração da dor na escolha de opióides na dor crônica. **Âmbito Hospitalar,** n. 156, p. 14-17, out. 2002.

SOUZA, Roger Burgoet al. Análise radiográfica da coluna cervical em indivíduos assintomáticos submetidos a tração manual. **Radiologia Brasileira**,v. 41, n. 4, p. 245-249, 2008.

TEIXEIRA, Manoel Jacobsen; FIGUEIRÓ, João AugustoBertuol. **Dor: epidemiologia, fisiopatologia, avaliação, síndrome dolorosa e tratamento**. São Paulo: Grupo Moreira Junior, 2001.

VERNON, Howard; HUMPHREYS, Barry Kim Chronic Mechanical Neck Pain in Adults Treated by Manual Therapy: A

Systematic Review of Change Scores in Randomized Controlled Trials of a Single Session. **The Journal of Manual &Manipulative Therapy**, v 16, n 2, 2008.

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EFFECT OF MANUAL THERAPY TECHNIQUES AND PAIN ON RANGE OF MOTION IN THE CERVICAL REGION

ABSTRACT

Neck pain is a common disorder and affects approximately two thirds of the population. The muscles of the neck have the function of balancing the head and suspend the thoracic spine and shoulder girdle. As a result, imbalances occur, shortening, contractures and painful downturns, however, in many cases it is not possible to detect its cause. The techniques provide mechanical and muscle reflexes. The responses of the central nervous system techniques also include muscle pain relief and muscle relaxation, caused by changes in the function of the drive motor and sensory receptors similar to Golgi tendon organs and muscle spindle. In this sense, the aimed of this study is to verify the effect of 10 sessions of manual therapy for the treatment of neck pain, with regard to pain relief and increased range of motion in young adults. For this purpose, the methodology consisted of a sample of ten female patients aged between 34 and 53 years, complaining of neck pain or discomfort, which were treated with technical manual cervical traction, stretching bilateral sternocleidomastoid, scalene, levator scapulae, upper trapezius, middle trapezius and lower trapezius, technical release trigger points and mobilization of the cervical segment. In the first and last visit were assessed range of motion of the cervical region, and during all sessions was noted, at the beginning and the end of the intervention, the degree of pain reported by patients. The results were significant, both in terms of decreased pain and increased range of motion. From this study it was concluded that manual therapy is effective to decrease pain and increase range of movement of young adults who have any pain or discomfort nonspecific cervical origin.

KEYWORDS: neck pain, manual therapy, range of motion

EFFET DES TECHNIQUES DE THÉRAPIE MANUELLE SUR LA DOULEUR ET L'AMPLITUDE DE MOUVEMENT DANS LA RÉGION CERVICALE

RÉSUMÉ

Cervicalgie est une affection très courante et affectera environ deux tiers de la population pendant la vie. Les muscles de la région cervicale ont la fonction d'équilibrer la tête et de suspendre la colonne vertébrale thoracique et la ceinture scapulaire. Par conséquent, se produisent les déséquilibres, les raccourcissements, les ralentissements et les contractures douloureux, cependant dans de nombreux cas, il n'est pas possible détecter la cause de la cervicalgie. Les techniques musculaires fournissent effets mécaniques et réflexes. Les réponses du système nerveux central aux techniques musculaires incluent aussi le soulagement de la douleur et la relaxation musculaire. Objectif: vérifier l'effet de 10 séances de thérapie manuelle pour tissus mous dans le traitement de la cervicalgie, dans la diminution de la douleur et dans l'augmentation de l'ampleur de mouvement surde jeunes adultes. Méthodologie: dix patients entre 34 et 53 ans, avec des plaintes de douleurs ou de l'inconfort cervical, ont été traitées avec les techniques de traction cervicale manuelle, stretching bilatéral du muscle sterno-cléido-mastoïdien, scalène, élévateur de la scapula, trapèze supérieur, trapèze moyen et trapèze inférieur; techniques de libération des points de déclenchement ; et la mobilisation du segment cervical. Dans la première et dernière séance les évaluations de l'ampleur de mouvement de la région cervicale ont été realisé, et endant toutes les séances, au début et à la fin de l'intervention, la gradation de la douleur exposée par les patients a été vérifié. Résultats: les résultats se sont présentés significatifs autant en ce qui concerne la réduction de la douleur que l'augmentation de l'ampleur de mouvement. À partir de cette étude onconclut que la thérapie manuelle est efficace pour diminuer la douleur et augmenter l'ampleur de mouvement desjeunes adultes qui se présentent avec n'importe quelle douleur ou inconfort cervical.

MOTS-CLÉS: Cervicalgie, Thérapie manuelle, Ampleur de mouvement.

EFECTO DE TÉCNICAS DE TERAPIA MANUAL SOBRE EL DOLOR Y LA AMPLITUD DE MOVIMIENTO EN LA REGIÓN CERVICAL.

RESUMEN

La cervicalgia es una enfermedad frecuente y afectará aproximadamente dos tercios de la población. Los músculos de la región cervical tienen función de equilibrar la cabeza y suspender la columna torácica y cintura escapular. En resultado, ocurren desequilibrios, acortamientos musculares, retracciones y contracturas dolorosas; sin embargo, en muchos casos no es posible detectar la causa. Las técnicas musculares generan efectos mecánicos y reflejos. En la respuesta del sistema nervioso central se incluye la disminución del dolor y el relajamiento muscular, obtenido por alteraciones en la unión neuromuscular y de receptores sensoriales similares al órgano tendinoso de Golgi y el huso muscular. Él presente trabajo tuvo como objetivo averiguar el efecto de 10 sesiones de terapia manual para los tejidos blandos en el tratamiento de la cervicalgia, refiriéndose a la disminución del dolor y aumento de la amplitud de movimiento en adultos jóvenes. Para eso, en la metodología se tomaron 10 mujeres con edad entre los 34 y los 53 años, que tenían queja de dolor o malestar cervical, todas fueron tratadas con la técnica de tracción cervical manual, stretching bilateral del músculo esternocleidomastoideo, escaleno, elevador de la escapula, trapecio superior, trapecio medio y trapecio inferior, técnica de liberación de los puntos gatillo y movilización del segmento cervical. A la primera y a la última sesión fueron realizadas evaluaciones, donde fue medida la amplitud de movimiento. Al comienzo y al final de cada una de las sesiones fue averiguado el dolor que el paciente refiriera. Los resultados se presentaran significativos tanto en relación a la disminución del dolor cuánto al aumento de la amplitud de movimiento. Con este estudio se concluye que la terapia manual tiene eficacia para reducir el dolor y aumentar la amplitud de movimiento de adultos jóvenes que presenten cualquier dolor o malestar cervical de origen inespecífica.

PALABRAS-CLAVE: Cervicalgia, terapia manual, amplitud de movimiento.

EFEITO DE TÉCNICAS DE TERAPIA MANUAL SOBRE A DOR E A AMPLITUDE DE MOVIMENTO NA REGIÃO CERVICAL

RESUMO

Cervicalgia é uma afecção comum e afetará aproximadamente dois terços da população. A musculatura da região cervical tem função de equilibrar a cabeça e suspender a coluna torácica e cintura escapular. Em consequência, ocorrem desequilíbrios, encurtamentos, retrações e contraturas dolorosas; contudo, em muitos casos não é possível detectar sua causa. As técnicas musculares proporcionam efeitos mecânicos e reflexos. Sendo que a resposta do sistema nervoso central inclui alivio da dor e relaxamento muscular, causado por alterações da unidade motora e de receptores sensoriais semelhante ao órgão tendinoso de Golgi e fuso muscular. Nesse sentido, o presente trabalho teve como objetivo verificar o efeito de 10 atendimentos de terapia manual para tecidos moles no tratamento da cervicalgia, no que se refere à diminuição da dor e ao aumento da amplitude de movimento em adultos jovens. Para tanto, a metodologia adotada consistiu em uma amostra de dez pacientes do sexo feminino com idade entre 34 e 53 anos, com queixa de dor ou desconforto cervical, que foram tratadas com técnica de tração cervical manual, stretching bilateral do músculo esternocleidomastóideo, escaleno, elevador da escápula, trapézio superior, trapézio médio e trapézio inferior, técnica de liberação de pontos gatilhos e mobilização do segmento cervical. No primeiro e último atendimento, foram realizadas avaliações da amplitude de movimento da região cervical e, durante todos os atendimentos, foi verificado, no inicio e ao final da intervenção, a graduação da dor referida pelo paciente. Os resultados apresentaram-se significativos, tanto em relação à diminuição da dor quanto ao aumento da amplitude de movimento. A partir deste estudo, concluiu-se que a terapia manual é eficaz para diminuir a dor e aumentar a amplitude de movimento de adultos jovens que apresentem qualquer dor ou desconforto cervical de origem inespecífica.

PALAVRAS-CHAVE: Cervicalgia, terapia manual, amplitude de movimento.