# 45 - TREATMENT OF CERVICOBRAQUIALGIA THROUGH TECHNICAL OF NEURAL

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## INTRODUCTION

According Butler6 Marinzeck7 the nervous system and has elastic properties, being able to shorten or lengthen in response to movements of the body segments. The central and peripheral nervous system is considered as a single, continuous, and this system is presented in three dimensions, which are mechanical continuity, which can be seen through the transmission of forces and motions generated by the wraps nerve cells present in the connective 6 7,8.

Thus, the proper functioning of the nervous system depends on its integrity. Once the nervous system is damaged, it leads to mechanical deformation of nerve fibers and local ischemia occurring then decreased axoplasmic flow and consequently alteration of nerve function, causing poor electrical conduction and causing sensory disturbances (pain, paresthesias), motors (weakness), and autonomic (vasomotor) 3,9,10,16.

The brachial plexus is formed by the anterior roots of the fifth cervical vertebra to the first thoracic vertebra and is responsible for the innervation of the entire upper limb 2,3,4. Therefore, an injury to the brachial plexus can cause symptoms in the upper limbs, as cervicobrachialgia. The Cervicobraquialgia is the presence of neck pain that radiates to one of the upper extremities through the territory corresponding to a low cervical nerve root, which may then cause changes in electrical conduction and axoplasmic flow changes 1,11,12,17. Often, the clinical picture of cervicobrachialgias is unilateral, and the pain starts in the low neck and spreads to the upper limbs, with topography radicular paresthesias usually associated with one or more dedos13.

Faced with the consequences that stemmed from cervicobrachialgia neural dysfunctions can lead to the individual seeks to recover both the mechanical and physiological function of the nervous system, restoring the same length and mobility, and musculoskeletal dysfunctions in structures that receive innervation, and second Marinzeck7 Santos14 and this is possible through the technique of neural mobilization, which it comes to passive movements imposed on neural tissue, promoting tension in neural tissue.

Given the complexity of the nervous system and its ability to adapt, we sought through this study to verify the feasibility of the use of neural mobilization technique in cervicobrachialgia of cervical origin, and this was analyzed through the evolution of the variables proposed as measurement range of motion of the cervical spine and upper limb symptomatic as well as the amount of pain present before and after treatment proposed.

## METHODOLOGY

This study was approved by the Ethics Committee on Human Research of the State University of West Paraná (Unioeste) campus Cascavel - PR.

We conducted a double-blind study , and this is characterized by being a qualitative and quantitative research on the type , cause- effect , slitting . The sample consisted of ten patients with cervicobrachialgia , seven women and three men, who were randomly selected from the inclusion criteria, which were: patients who presented with clinical signs of cervicobrachialgia of cervical origin , which according Cyriax10 are weakness of muscles innervated by the root compromised, decreased or absent tendon reflexes , pain and / or paresthesia in the distal end of the dermatome , which present limited range of motion of the cervical spine and upper limb symptomatic , who were in the queue expected attendance of Physiotherapy Clinic UNIOESTE , patients who were not receiving any type of treatment , even medication during the time of participation in the research ; aged between 40 and 60 years , regardless of race and gender , that had availability time and who signed the term of consent . Were excluded patients with comorbidities that could come to interfere with the proposed treatment ; patients who suffer worsening of symptoms; patients with any contraindication to the technique used.

n the first call made to the collection of personal data, and then the patients underwent an initial assessment carried out by the researcher responsible for confirming the clinical signs of cervicobrachialgia of cervical origin. Specific orthopedic tests were performed to confirm the diagnosis, as the Valsalva test, the Test Spurling; Distraction Test, and the Test of maximum compression and foraminal compression, each described by Cipriano15. We also conducted a tension test of the median nerve and radial, which is also made of the same treatment as described by Cipriano15.

The amount of current pain level and range of motion of the cervical spine and upper limb symptom recorded during all visits made before and after the treatment, so that they could check the evolution of these. Then, during the ten sessions, patients were treated neural mobilization of the affected limb median nerve (ULNT1) and radial nerve (ULNT 2), which was conducted by the employee's work, total of ten sessions, performed on average 2 times per week, 10 minutes for each nerve.

During all ten calls verified at the beginning and end of the treatment the amount of pain by this visual analog scale (VAS), patients marked where the amount of current pain of 0 to 10, 0 representing no pain and 10 maximum pain. It was also active range of motion of the cervical spine by cervical inclinometer CROM (Cervical Range Of Motion) for flexion, extension, rotation and lateral tilt, which takes place through three inclinometers (2 gravitational and magnetic 1) fixed on a rod placed as glasses the patient's face. So it sat, feet flat on the floor, ankles, knees and hips at 90° of flexion without footwear.

To evaluate the range of motion of the upper limb symptomatic, made up using the digital inclinometer brand Baseline. To measure these amplitudes the patient remained seated to prevent large offsets, and then became inclinômentro placement on the patient's arm and then measured the flexion, extension, abduction and adduction.

Data collection took place in the premises of the Physiotherapy Clinic of Unioeste where all patients were evaluated and treated in the same way. The results obtained in the measurement of range of motion of the cervical spine as much as symptomatic of the upper limb, and the level of pain present during each visit were tabulated after each session, so that at the end of data collection the same could be compared. After collecting the data, they were tabulated in Microsoft Excel 2003 and then was performed Student t test for comparison of means dependent on the level of 5% probability.

**RESULTS**

The sample consisted of 10 patients, seven were female (70%) and three males (30%) with a mean age of 49.5 years. All patients selected for the sample were included in the survey, and there were no dropouts or exclusion by the researchers.

In Table 1 it can be seen that by neural mobilization of the median nerve and radial had a significant increase in range of motion of the cervical spine at the level of 5% between the beginning and end of treatment. In the rotation and lateral tilting of the cervical spine were performed to better average bilateral tabulation.

TABLE 1: Comparison of movement amplitudes before and after the treatment of neural mobilization (cervical).

| | Rotation | | Inclination | | Flexion | | Extension | |
|---|---|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After | Before | After |
| Average | 33,0 | 60,4 | 25,1 | 41,8 | 56,9 | 75,5 | 39,5 | 62,9 |
| Deviation | 6,5 | 2,1 | 6,3 | 1,4 | 3,0 | 3,4 | 4,7 | 3,0 |
| p-valor | 0,00* | | 0,00* | | 0,00* | | 0,00* | |

Table 2 shows the comparison between the beginning and end of treatment, range of motion of the upper limb symptomatic, noting a significant difference at 5% between the first and tenth evaluation.

TABLE 2: Comparison of movement amplitudes before and after the treatment of neural mobilization (upper).

| | Flexion | | Extension | | Adduction | | Abduction | |
|---|---|---|---|---|---|---|---|---|
| | Before | After | Before | After | Before | After | Before | After |
| Average | 167,3 | 178,4 | 37,4 | 43,6 | 31,2 | 40,7 | 164,1 | 177,8 |
| Deviation | 3,8 | 1,9 | 2,5 | 1,4 | 1,5 | 1,6 | 3,8 | 2,6 |
| p-valor | 0,00* | | 0,00* | | 0,00* | | 0,00* | |

In relation to the present pain at the beginning and at the end of treatment, mean baseline was 8.8 (sd: 0.8) and a final 0. Ie, there is a significant difference at the 5% level, between the first and tenth evaluation, and 100% of patients reached the tenth call with 0 pain VAS.

The average percentage of variation between ADM's cervical spine before and after neural mobilization, was 83% for rotation, tilt to 67%, 33% to 59% for flexion and extension. As for the upper affected was 7% for flexion, extension of 17% to 30% for adduction and abduction to 8%. This is the biggest change in range of motion of the cervical spine occurred in rotation, and upper limb adduction movement.

**DISCUSSION**

In our study it was noted that cervical dysfunctions affecting the upper end have a higher incidence in women, and the sample comprises seven women and three men, which was also a finding consistent with research conducted by Alisson11 and Mellado5. According Bonfá13 and Yoshinari, most cases occurs cervicobrachial neuralgia pain levels of C6, C7 and C8, which justifies the choice of neural mobilization medial nerve and radial directions.

Butler6 states that through the neural mobilization achieved by ensuring the proper functioning of the nervous system, because this technique leads to the maintenance of axonal transport, which is dependent on blood flow constant. The same author further states that several studies seek to prove the influence of neural mobilization on the nervous system, providing improved blood flow, axoplasmatic, in order to then return their physiological and functional capabilities. Cites that the creators of tension test Neural believe the body movements not only cause an increase in tension, but are also able to move the nerve tissues in relation to their neighbors.

From the results obtained, it can be noted that has significantly reduced, and both the range of motion of the cervical spine, the upper limb underwent a significant increase in symptom. According Butler6, Marinzeck7 Beleski8 and this is only possible due to the nervous system is considered unique and continuous, which is being considered by Butler since 1991. Marinzeck7 claims the nervous system contains elastic properties able to lengthen and shorten as the stresses imposed on it. Study as Beleski8, proves the presence of neural tension tests neural tension median and radial nerve in patients with cervicobrachialgias, which provides justification for the theory created by the creators of the technique of neural tension.

In the present study we noted significant effect on the range of motion of the cervical spine as much of the upper limb after symptomatic neural mobilization of the median nerve and radial. All ranges of motion of the cervical spine were within the normal range after the treatment, according to the reference values proposed by Kapandji19. After neural mobilization, all ranges of motion of the upper limb also symptomatic were within the normal range also based on the values described by Kapandji20.

Smaniotto et all21 proposed neural mobilization technique in order to evaluate the gain in range of motion of hip flexion, which obtained a significant increase of the same, which is in line with this work. Vasconcelos22 applied the technique of neural mobilization in patients with low back pain, and noted gradual improvement in range of motion, while for Boeing23 no significant results regarding the increased mobility of the lumbar spine.

In this study, it was observed variance greater range of motion of the cervical spine in rotation, followed by tilting, extension and finally bending. In a study conducted by Pereira24 noticed a greater gain in flexion (2.3%) followed by rotation (1.3%), but it reports that the patient had significant shortening of the sternocleidomastoid muscle. Regarding the variation of the amplitude of motion of the upper limb symptomatic, the biggest change was for the abduction, then by extension, abduction and last flexion.

Regarding pain symptoms present in patients in this study, 100% of patients reached the last visit without pain (VAS 0), which was statistically significant. Study how to Guelfi18 shows the influence of neural mobilization on pain symptoms in patients with siringomiela, and it obtained significant results regarding the painful picture, which is in agreement with this study.

Pereira24 already conducted a study comparing the neck manipulation and self-healing in patients with neural cervico and obtained pain relief VAS rated by 50% after treatment of cervical manipulation, and no decrease after self-treatment neural not compatible with the results obtained in this study, however, the author reports that this result was obtained because of lack of cooperation of the patient during the course of it, because the procedure should be performed at home by the patient herself. Vasconcelos22 Boing23 and used the technique of neural mobilization for patients with low back pain, and obtained significant results in the reduction of the pain.

Marinzeck7 justifies the reduction of pain, reporting that neural mobilization seeks to restore motion and elasticity to

the nervous system, which promotes the return of their normal functions. Therefore, the technique assumes that there is a commitment of mechanics / physiology of the nervous system (movement, elasticity, driving, axoplasmic flow) it can result in other disorders in their own nervous system or musculoskeletal structures that receive innervation. Restoring your biomechanics / physiology (neurodynamic) through the proper motion and / or voltage can recover normal function of the nervous system as well as the compromised structures. This restoration is via oscillatory movements and / or maintained briefly directed to the peripheral nerves and / or spinal cord.

**CONCLUSION**

The results obtained in this study are consistent with the objectives outlined, noting, then, that the neural mobilization held in the affected upper limb (symptomatic) is effective in reducing the painful evolution and range of motion of the cervical spine as much as the member upper symptomatic bounded within the sample.

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**TREATMENT OF CERVICOBRAQUIALGIA THROUGH TECHNICAL OF NEURAL MOBILIZATION**

**ABSTRACT**

Faced with symptoms caused by cervicobrachialgias as pain, paresthesia and muscle weakness, it was investigated whether the technique of neural mobilization is effective for patients with cervicobrachialgias, recovering both the mechanical and physiological function of the nervous system. It was performed a double-blind study, qualitative-quantitative type, cause-effect, slitting longitudinal. The sample consisted of 10 patients, selected from the inclusion and exclusion criteria, which was first performed an initial evaluation, followed by the application of the technique of neural mobilization of the median and radial nerve, for ten minutes each, in the upper limb symptoms. It had as parameters of improves the evolution of pain analyzed by Visual Analog Scale of pain and evolution of the range of motion of the cervical spine, measured by the inclinometer cervical (CROM), and upper limb measured by digital inclinometer Baseline. After data collection was performed t-student test for comparison of dependent average on the 5% level of probability. It was noted significant improvement in all measure of range motion, the largest gain in the cervical spine was rotation (83%), and adduction (30%) for the upper limb and significant improvement of pain present. It is concluded that neural mobilization is effective in reducing the painful and evolution of both range of motion from cervical spine and upper limb symptoms, defined within the sample.

**KEYWORDS:** Cervicobrachialgia, Neural Mobilization, Ampleness as of bandwagon

**TRAITEMENT PAR TECHNIQUE CERVICOBRAQUIALGIA NEURONES MOBILISATION**

Parmi les symptômes causés par cervicobrachialgia que la douleur, engourdissement et faiblesse , a cherché à savoir si la technique de mobilisation neurale est efficace pour les patients atteints cervicobrachialgia , en récupérant la fois la fonction mécanique et physiologique du système nerveux . Nous avons mené une étude en double aveugle , le qualiquantitativo de type cause à effet , le découpage . L'échantillon était composé de 10 patients , choisis parmi les critères d'inclusion et d' exclusion, qui s'est d'abord une évaluation initiale , suivie de l'application de la technique de mobilisation de neurones du nerf médian et radial pendant dix minutes chacun, membre supérieur symptomatique . Eu comme paramètres améliore l'évolution de la douleur, évaluée par échelle visuelle analogique de la douleur, et les changements dans l'amplitude de mouvement (ROM) de la colonne cervicale , mesurée par l'inclinomètre CROM membre cervical et supérieure symptomatique mesurée par la base de l'inclinomètre numérique. Après la collecte de données de test t de Student a été effectuée pour comparer signifie dépend du niveau de probabilité de 5% . Remarqué une amélioration significative de tous les SMA mesurée , où la plus forte progression dans la ROM de la colonne cervicale était en rotation ( 83%), et l'adduction (30 %) pour le membre supérieur, ainsi que l'amélioration significative de la douleur présente . Il a été conclu que la mobilisation de neurones est efficace pour réduire la douleur et l'évolution du rachis cervical d'ADM autant que l' symptomatique des limites supérieures dans l'échantillon.

**MOTS-CLÉS**: Cervicobraquialgia, mobilisation neurale, amplitude des mouvements.

**TRATAMIENTO MEDIANTE TÉCNICAS CERVICOBRAQUIALGIA NEURAL MOVILIZACIÓN**

**RESUMEN**

Entre los síntomas causados por Cervicobraquialgia como dolor, entumecimiento y debilidad , tratado de saber si la técnica de la movilización neural es eficaz para los pacientes con Cervicobraquialgia , tanto la recuperación de la función mecánica y fisiológica del sistema nervioso. Se realizó un estudio doble ciego , el tipo qualiquantitativo , causa-efecto , corte longitudinal . La muestra estuvo constituida por 10 pacientes , seleccionados de entre los criterios de inclusión y exclusión , que se convirtió primero una evaluación inicial , seguido de la aplicación de la técnica de la movilización neural del nervio mediano y radial durante diez minutos cada uno, los miembros superiores sintomática . Tenía como parámetros mejora la evolución del dolor , evaluado mediante escala visual analógica del dolor, y los cambios en la amplitud de movimiento ( ROM ) de la columna cervical , medido por el inclinómetro CROM cervical y la extremidad superior sintomática medido por la Línea de Base inclinómetro digital. Después de la recogida de datos se llevó a cabo prueba de la t de Student para la comparación de los medios depende del nivel de 5 % de probabilidad. Notado una mejora significativa en todas las ADM de medida , donde la ganancia más grande en la ROM de la columna cervical era en rotación ( 83 % ) , y la aducción ( 30 % ) de la extremidad superior , así como una mejora significativa del dolor presente . Se concluyó que la movilización neural es eficaz para reducir el dolor y la evolución de la columna cervical de ADM tanto como la parte superior sintomática delimitada dentro de la muestra.

**PALABRAS CLAVE:** cérvico duele el brazo, Movilización Neural, rango de movimiento.

**TRATAMENTO DA CERVICOBRAQUIALGIA ATRAVÉS DA TÉCNICA DE MOBILIZAÇÃO NEURAL**

**RESUMO**

Frente aos sintomas causados pela cervicobraquialgia como dor, parestesia e fraqueza muscular, buscou-se saber se a técnica de mobilização neural é eficaz para os pacientes com cervicobraquialgia, recuperando tanto a função mecânica quanto fisiológica do sistema nervoso. Realizou-se um estudo duplo-cego, do tipo qualiquantitativo, tipo causa efeito, de corte longitudinal. A amostra foi composta por 10 pacientes, selecionados a partir dos critérios de inclusão e exclusão, onde primeiramente fez-se uma avaliação inicial, seguida pela aplicação da técnica de mobilização neural do nervo mediano e radial, durante dez minutos cada, no membro superior sintomático. Teve-se como parâmetros de melhora a evolução do quadro álgico, analisada através da Escala Visual Análoga da dor, e evolução das amplitudes de movimento (ADM) da coluna cervical, mensuradas através do inclinômetro cervical CROM, e do membro superior sintomático, mensurado através do inclinômetro digital Baseline. Após a coleta dos dados foi realizado teste t-student para comparação de médias dependente do nível de 5% de probabilidade. Notou-se melhora significativa em todas as ADM's mensuradas, onde o maior ganho de ADM da coluna cervical foi no movimento de rotação (83%), e adução (30%) para o membro superior, bem como melhora significativa do quadro álgico presente. Conclui-se então que a mobilização neural é eficaz para a redução do quadro doloroso e evolução das ADM's tanto da coluna cervical quanto do membro superior sintomático, dentro da amostra delimitada.

**PALAVRAS-CHAVE**: Cervicobraquialgia, Mobilização Neural, Amplitude de movimento.