36 - IMPROVEMENT OF THE FUNCTIONALITY AND OF THE QUALITY OF LIFE AFTER THE APPLICATION OF THE CONSTRAINT INDUCED MOVEMENT THERAPY (CIMT) IN A HEMIPARETIC PATIENT

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INTRODUCTION

The cerebrovascular accident is the acute emergence of a neurological dysfunction due to an abnormality in the cerebral circulation, having as a result signs and symptoms which correspond to damages in focal areas of the brain. The world stroke is more used instead of cerebrovascular accident, to assign the cerebrovascular problems which follow an ischemia and a hemorrhage (SULLIVAN & SCHMITZ, 2004).

Approximately 80% of the cerebrovascular accident cases are due to the occlusion, which can be by an atheroma in the artery or secondary emboli, which deprive the brain from oxygen and glucose hurting the cellular metabolism and consequently causing a lesion and death of some tissues. In the hemorrhagic cerebrovascular accident, there is an abnormal bleeding inside the interstice of the brain as a consequence of an aneurysm or a trauma. The hemorrhage increases the intracranial pressure causing lesions in the cerebral tissues and restriction of the distal blood flow (SULLIVAN 4 SCHMITZ, 2004; MAZZOLA et al., 2007). The cerebrovascular accident is pathology which causes a bigger acometiment of the neuromuscular function, the voluntary movements or even though the maintenance of posture (KLOTZ, 2006).

Most of the patients survive the acute phase. Although the majority of them recovers the abilities of walking, just about 30 to 66% of the patients are able to use the arm which was affected. That makes the process of recovering the function of the superior extremity slower than the process of recovering the function of inferior extremity (HON, 2003).

The pain in the shoulder is common in the patients with cerebrovascular accident and its main causes are due to traumas, altered muscle tone, glenohumeral subluxation, capsular structure contracture and syndrome of shoulder-hand (SULLIVAN & SCHMITZ, 2004).

The normal function of the superior extremity includes the capacity of directed reach, prehension and manipulation of objects, which is the base of the motor capacity required to the accomplishment of the daily activities. After a unilateral lesion of the patient's central nervous system, the patient may be not able to use the involved superior extremity when the opposite one is less affected or it is not affected is available. Even individuals with a light hemiparesis, the reach and prehension movements of the impaired superior member present reduction and slowness of the spaciousness of the movement, and the path is characterized by segmented movements, low variety and interarticular coordination interrupted when compared to healthy individuals.

The most common techniques for the treatment of the cerebrovascular accident consist in: functional electro stimulation (FES), acupuncture, Bobath, hydrotherapy, conventional kinesitherapy, Kabat and constraint induced therapy (CIT) (HON, 2003; SOCIEDADE BRASILEIRA DE DOENÇAS CEREBROVASCULARES, 2002; DINIZ & ABRANCHES, 2003; TAUB, 1999).

The treatment of the paretic superior member through the constraint induced therapy has shown to be quite efficient in the rehabilitation of patient with cerebrovascular accident. This happens due to the neural plasticity in which the brain can functionally readapt occurring a reorganization in the cortex which contributes to the recovering of the cerebrovascular accident (TAUB, 1999).

The cerebral reorganization, best known as neural plasticity, consists in changes in the organization of the cortex, which includes: the raise of the dentrites of the synapses and of the neurotrophic factors which are essential to the survival of the nervous cellulae.

After there is a lesion in any place in the brain in motor cortex, changes of activation are observed in other motor regions. These changes can occur in homolog regions of the not affected hemisphere, which take the control of the lost functions, or in the intact cortex adjacent to the lesion. It happens because of the cortical reorganization that can happens one or two days after the cerebrovascular accident and it goes on for months. This way the patient will be able to recover, at least, part of his/her abilities which have been lost (DINIZ & ABRANCHES, 2003; TAUB, 1999; BRITO & FILHO, 2001).

The recovering of the members function promoted by the neuroplasticity becomes difficult because a phenomenon known as “non-use learnt”. With the loss of the function of an area in the brain because the cerebrovascular accident, the region of body which is connected to this region is also affected, losing its capacity of movement. As the patient cannot move the member affected, then he or she compensates using the other. Therefore, after a certain time, when the effects of the lesion are no longer present and readaptations had occurred in the brain, the movements are no longer functional (PAGE et al., 2001). The constraint induced therapy has been quite used in the treatment of the non-use learnt of the superior member, besides that, it has demonstrated a raise in the plastic changes favorable to the recovering (TAUB, 1999; BRITO & FILHO, 2001).

The present study came up because the necessity to have more clarification about the efficient physiotherapeutic interventions in the treatment of the functional loss of the paretic superior member, besides that the lack of studies in the literature about the proposed theme and also due to the great number of people impaired by a cerebrovascular accident. This study will also help other professionals of physiotherapy using the CIT in the treatment of the paretic superior member. Therefore, patients impaired with the cerebrovascular accident will be the ones who will get more beneficience with this kind of treatment.

The general goal of this study was to evaluate the functional improvement and the impact in the quality of life of a hemiparetic patient treated by the CIT, and demonstrate the benefits of therapy in the improvement of the functionality of paretic superior member, and also evaluate the quality of life, the spacious of movement of the articulations, the muscular strength and the tone of the paretic superior member before and after the use the constraint induced therapy.

MATERIALS AND METHODS

This study is an original work, similar to case study, accomplished in the patient's house in the city of Ubá in Minas Gerais.

The study was addressed to the ethic and research committee of UNIPAC, obeying to the resolution of Health National Council (196/96).

EXPERIMENTAL SAMPLE

The present study was accomplished with a female patient, 53 years old, with a ,patient was included in this study because she presented: cerebrovascular accident, a slight hemiparesis on the left, with a persistent decrease of the motor function in the paretic superior member, not presenting severe spasticity (flexor partner), although with great incapacity of functional use of the paretic superior member.

INSTRUMENTS

The tools used to the evaluations before and after the CIT with 1 hour and 3 hours of treatment were: the scale of quality of life (SF-36) which is composed of 36 items, divided in eight dimensions: functional capacity (10 items), limitations caused by physical health problems (4 items), limitations caused by mental health problems (5 items), pain (2 items) and current health condition compared to the health condition one year ago (1 item). Each item is calculated and gets a score which lately is transformed into a scale from 0 to 100, being 0 the worst mark and 100 the best health condition. The Barthel Index to evaluate the functionality, evaluates the degree of assistance demanded by an individual, in 10 items AVD's involving the mobility and personal care. The levels of measuring are limited to the complete independence or to the necessity of assistance. By Each item of performance is evaluated in an ordinal scale, with a specific number of points assigned to each level or classification. An individual uses who gets the help of a person to eat, would get 5 points. The independence to eat would get 10 points. A global simple punctuation varying from 0 and 10 is calculated from the sum of all punctuations of individual items, so 0 is the complete dependence in all 10 activities, and 100 is a complete independence in all activities. It was also evaluated the muscles: bigger pectoral, brachial biceps, brachial triceps and deltoid by the muscular strength test (MST).

The muscular tone was evaluated by the modified Ashworth scale, which is one of the methods more used to evaluate the muscular tone in patients with neurological impairment, and punctuation vary from 0 (without the raising of the muscular tone) to 4 (rigid affected member in flexion or extension) of the muscles: brachial biceps and flexor of wrist and fingers. To the evaluation of the amplitude of the movement (ADM) of the articulation of the shoulder, elbow and wrist was used a CARCI goniometer.

To the contention of the healthy superior member it was used an American adult quilted sling (UDINE) giving to the patient a bigger comfort to do the activities with the impaired superior member (PICTURE 1). Besides that, the exercises were registered by digital camera which is a SONY DSC-S730 Cyber-shat.



Picture 1- Patient using the sling.

To accomplish the technique it was used: cones, marbles, polystyrene balls, table-tennis balls, mugs, beans, cubes, dominos, cards, screws, modeling pastry, fork and knife, a resta 1 game, pegs, clips, and glass of water.

PROCEDURES

The patient was submitted to CIT treatment during two weeks (10 days), using the contention first for 1 hour of functional exercises every day. After the ten days there was a month break (TOJEDOR, et al., 2001) and then it was applied to patient a pattern protocol of 3 hours of CIT during two weeks (10 days) doing functional exercises. It was used about 15 functional exercises involving the paretic superior member, while the healthy member was in a sling. The functional activities were: picking beans; pile cubes; put the marbles in the mug; resta 1 screw; cut the modeling pastry; transfer the water from a glass to another; clip and mug; put and take of the pegs; modeling pastry in the fork; cubes in the box (PICTURE 2). The evaluations were accomplished before 1 of CIT, after 1 and 3 hours.



Picture 2- Patient performing functional activities (little ping-pong and mug).

STATISTIC ANALYSIS

To the statistic analysis it was used the t-student test paired with the level of significance of 0.05 and 0.10.

RESULTS

Through the statistic analysis the quality of life which was evaluated by the SF-36 after an hour of application of the CIT it is observed by the t-student test paired with the level of significance of 0,1 one t-tabled of 1,90 and t-calculated 2,12 with 7 degrees of, intervals. After a 3 hours intervention, o t-calculated was 0,31, when compared with other data of 1 hour, when analyzing the data before the 1 hour therapy with the data after 3 hours it was observed um t-calculated of 2,15 (CHART 1).

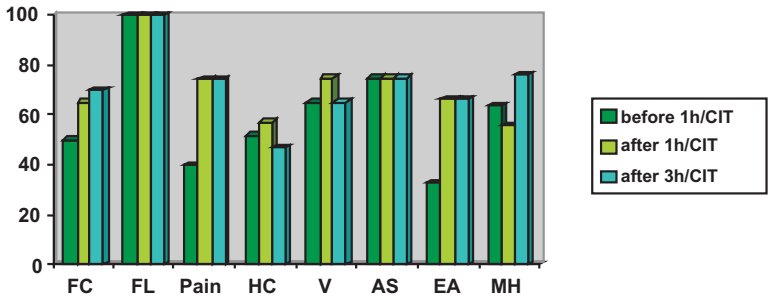

Chart 1- Values evaluated through the SF-36 to the quality of life before and after a CIT in (%) with 1 hour, after 1 hour and after 3 hours. The parameters evaluated were: functional capacity (FC), limitation through physical aspects (FL), pain, general health condition (HC), vitality (V), social aspects (SA), emotional aspects (EA), mental health (MH).

In the Barthel Index analysis it was demonstrated before the intervention of 1 hora with a TCI a score of 90 and after the 1 hour intervention a score of 95, after a 3 hour treatment the score was 95 (CHART 2).

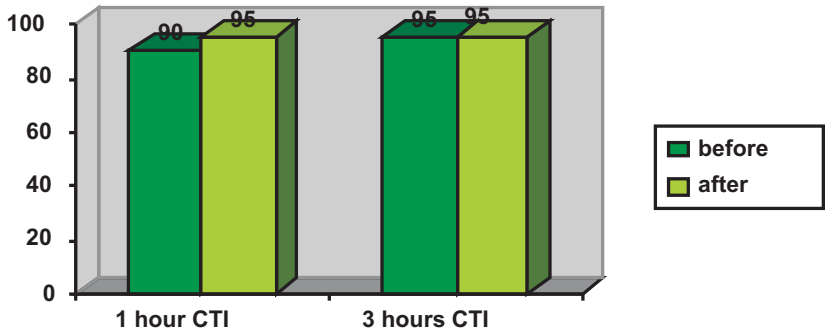

Chart 2- Values evaluated from the Barthel Index before and after a 1 hour TCI and a 3 hour TCI treatment.

The evaluation of the muscular strength as showed in the chart 1 presented, according to the t-student test paired to the level of significance of 0,10 a t-calculated of 3,0 and t-tabled of 2,35 in 1 hour of CIT and t-calculated of 3,0 after 3 hours of TCI.

Chart 1- Evaluation of the muscular strength degree of the paretic superior member before and after a CIT.

Muscles	Before 1 hour	After 1 hour/before 3 hours	3 hours
Pectoral	3	3	4
Biceps	3	4	4
Triceps	3	4	4
Deltoid	3	3	4

The evaluation of the ADM of the paretic superior member presented according to the statistic test a t-calculated of 4,26 and a t-tabled of 2,20 with 7 degrees of intervals after 1 hour of CIT and a t-calculated of 2,65 after 3 hours, as it is demonstrated in chart 2. The values of muscular tone evaluated by the Ashworth scale are represented in chart 3.

Chart 2- ADM degree of paretic superior member before and after the CIT.

Shoulder (ADM)	Before 1 hour	After 1 hour/before 3 hours	After 3 hours
Extension	40º	42º	44º
Flexion	100º	112º	130º
Adduction	30º	34º	36º
Abduction	70º	160º	171º
Elbow (ADM)	**Before 1 hour**	**After 1 hour/before 3 hours**	**After 3 hours**
Flexion	130º	139º	142º
Extension	115º	140º	141º
Pronation	87º	90º	90º
Supnation	85º	90º	90º
Wrist (ADM)	**Before 1 hour**	**After 1 hour/before 3 hours**	**After 3 hours**
Flexion	45º	70º	79º
Extension	68º	69º	70º
Radial deviance	15º	19º	20º
Ulnar deviance	40º	42º	45º

Chart 3- The evaluation of muscular tone degree of the paretic superior member.

Ashworth Scale	Before	After 1 hour/3 hours
Biceps (flexion)	+1	1
Wrist and fingers flexors	+1	1
Fingers flexors	1	0

DISCUSSION

The adapted protocol of 3 hours of the CIT was selected because it has already demonstrated its efficacy in a study involving 18 patients with hemiparesis after a cerebrovascular accident and in other studies involving the therapy (STERR et al., 2002). But with 1 hour of application of CIT there are no studies which prove its efficacy, although the reduction of the number of hours of supervised practice it is possible to prevent muscular, physical and mental fatigue.

According to Page et al, it is possible to occur other changes in the amount of time of the therapy, and in the administration of alternate days (PAGE et al., 2001). Therefore the present study evidenced a significant improvement in the quality of life after 1 hour of CIT, because the t-calculated of 2.12 was bigger than t-tabled of 1,90 with a significance of 0,1. When the quality of life was compared to after 1 hour with the results of 3 hours it was not observed significant gains (0,31). This is also evident in the evaluation of the functionality and independence by the Bartherl Index, that after 1 hour of CIT it was observed a score of 95 and after 3 hours of therapy the score was the same. The improvement of muscular tone was also kept after 1 and 3 hours of CIT.

Studies similar to the Pereira et al. ones, demonstrate that the improvement of the functionality of patients impaired by cerebrovascular accident is directly related with the improvement of the quality of life (PEREIRA et al., 1996).

In the analysis of the muscular tone as demonstrated in the chart 1, it is possible to observe improvement in the degree of the muscular strength after 1 hour and after 3 hours of CIT, because the t-calculated was of 3,0 and the t-tabled was of 2,35. In the analysis of ADM the articulations of the paretic superior member it was observed a significant improvement after 1 hour of CIT and after 3 hours, in which the t-calculated of the first was 4,26 and the t-calculated of the second was 2,65. Through these data it was possible to observe a better result after 1 hour when compared to 3 hours. This corroborates with Dromerick et al, in which was possible to verify significant gains in the strength, prowess and ADM in patients in the hospital after 2 hours of CIT (DROMERICK et al., 2000). The study demonstrated that the gains in the muscular strength and the amplitude of movements after 3 hours of CIT did not benefit in equal proportions the gain of functionality and quality of life.

CONCLUSION

We can conclude that there was an improvement in the functional independence and in the quality of life of the hemiparetic patient after the application of constrain induced therapy, with 1 hour or 3 hours of intervention, but it is recommended the accomplishment of this study with a bigger sample in which the results can be confirmed and applied in a hemiparetic population.

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IT AFTER IMPROVES OF THE FUNCTIONALITY AND THE QUALITY OF LIFE APPLICATION OF THE INDUCED THERAPY FOR CONTENSÃO (TCI) IN A PATIENT HEMIPARÉTICO.

ABSTRACT:

The therapy induced by contension is a technique that has been used very successfully in the rehabilitation of paretic superior member with encephalic vascular accident. This study's target is evaluating the improvement in life quality of hemiparetic patients treated by the therapy induced by contension. A study was made in a 53 year old, female patient who had left hemiparesy.The patient received the adapted protocol of the therapy, that lasts 2 weeks, at first for 1 daily hour and then for 3 daily hours of functional exercises involving the paretic superior member ,while the other healthy member was kept immobilized. To the evaluation of life quality the questionary SF-36 was used and to functionality, Barthel's index was used before and after the end of the therapy. In the statistical analysis the test T-student was used with significance level of 0.05 and 0.1.The results showed, through statistical analysis of life quality after one hour of therapy, a significance leved of 0.1 with a t-table of 1.90 and t-calculated 2.12 with 7 degrees of freedom. A after the 3 hour intervention, the t-calculated was 0.31 when compared to the 1 hour data, when analyzing the data before the 1 hour therapy with the data after 3 hours, a t-calculated of 2.15 was observed. In functionality after 1 hour of therapy, a score of 95 was observed and after 3 hours this score was the same. Based on it, this study concluded that there's improvement in the functional dependence amid in life quality of hemiparectic patients after the usage of Therapy Induced by Contension.

KED-WORDS: Therapy Induced by Contension.Encephalic vascular accident.

L'AMELIORATION DE LA FONCTIONNALITE ET DE LA QUALITE DE VIE APRES L'APPLICATION DE LA THERAPIE PAR CONTRAINTE INDUITE (TCI) CHEZ UN PATIENT HEMIPARETIQUE.

RÉSUMÉ:

Introduction: La Thérapie par Contrainte Induite (TCI) est une technique appliquée avec un grand succès dans la réhabilitation du membre supérieur parétique des patients aient souffert un accident vasculaire cérébral. Objectif : Évaluer l'amélioration de la qualité de vie des patients hémiparétiques traités par la TCI. Méthodologie: On a effectué une étude de cas sur une patiente âgée de 53 ans, du sexe féminin qui présentait une hémiparésie gauche. La patiente a été soumise au protocole de la TCI pendant deux semaines, d'abord par une heure et après par trois heures quotidiennes d'exercices fonctionnels concernant le membre supérieur parétique, tant que l'autre membre sain restait immobilisé. Pour évaluer la qualité de vie on s'est servi du questionnaire SF-36 et pour la fonctionnalité on a utilisé l'Indice de Barthel avant et après la TCI. Pour l'analyse statistique, on a utilisé le test T-Student par paires avec un niveau significatif de 0,05 et 0,1. Résultats: Les résultats nous ont possibilité la démonstration à travers l'analyse statistique de la qualité de vie après une heure d'application de TCI un niveau d'importance de 0,1 avec une t-table de 1,90 et t - calculé 2,12 avec 7 degrés de liberté. Après l'intervention de 3 heures, le t-calculé obtenu était 0,31 par rapport aux données de 1 heure, en analysant les données précédant la thérapie de 1 heure avec les données après 3 heures on a obtenu un t-calculé de 2,15. Sur la fonctionnalité, après 1 heure de TCI on a observé un écore de 95 et après les 3 heures de thérapie celui-ci s'est maintenu. Conclusion: On a observé l'amélioration de l'indépendance fonctionnelle et de la qualité de vie de patients hémiparétiques après l'application de la thérapie par contrainte induite.

MOTS-CLÉS: Thérapie-affirmation induit. AVE.

MEJORA DE LA FUNCIONALIDAD Y CALIDAD DE VIDA DESPUÉS DE LA APLICACIÓN DE LA TERAPIA RESTRICCIÓN INDUCIDA (TRI) EN UN PACIENTE HEMIPARÉTICA

RESUMEN

Introducción:La terapia inducida por el tratamiento de retención (TRI) es una técnica que se ha aplicado con gran éxito en la rehabilitación de la extremidad superior com paresia em los pacientes afectados por el accidente cerebrovascular (ACV). Objetivo: Evaluar la mejora en la calidad de vida de los pacientes hemiparéticos tratados por TRI. Materiales y métodos: Se realizó un estudio de caso com uma paciente con 53 años de mujer de edad presenta una hemiparesia de la izquierda. El paciente fue remitido al protocolo de la TRI, que dura 2 semanas, en primer lugar por 1 hora y luego de 3 horas de ejercicios funcionales que afectan la paresia del miembro superior, mientras que el outro membro permaneció sano contenida en un cabestrillo. Para evaluar la calidad de vida se utilizó el SF-36 y se utilizó la función de índice de Barthel antes y después del final de TCI. El análisis estadístico se utilizó para la prueba t-Student con un nivel de significación de 0,05 y 0,1. Resultados: Los resultados ponen de manifiesto a través del análisis estadístico de la calidad de vida después de una hora de aplicación de las TIC de un nivel de significación de 0,1, con un t-mesa y 1,90 a 2,12 calculado con 7 grados de libertad. Después de la intervención de 3 horas, el t-calculado fue de 0,31 en comparación con los datos de 1 hora de analizar los datos antes del 1 de terapia horas con los datos después de 3 horas se observó en t - 2, calculado, 15. Funcionalidad después de 1 hora de TCI observó una puntuación de 95 y después de 3 horas de terapia de este marcador se mantuvo. Conclusión: Se observó mejoría en la independencia funcional y la calidad de vida de los pacientes hemiparética después de la aplicación de la terapia inducidas por la contención.

PALABRAS CLAVE: Contención inducido terapia-. AVE.

MELHORA DA FUNCIONALIDADE E DA QUALIDADE DE VIDA APÓS APLICAÇÃO DA TERAPIA INDUZIDA POR CONTENSÃO (TCI) EM UM PACIENTE HEMIPARÉTICO.

RESUMO

Introdução: A terapia induzida por contensão (TCI) é uma técnica que tem sido aplicada com grande sucesso na reabilitação do membro superior parético de pacientes acometidos por acidente vascular encefálico (AVE). Objetivo: Avaliar a melhora na qualidade de vida, de pacientes hemiparéticos tratados pela TCI. Metodologia: Foi realizado um estudo de caso com uma paciente de 53 anos de idade, gênero feminino apresentando uma hemiparesia á esquerda. A paciente foi submetida ao protocolo da TCI, que tem duração de 2 semanas, primeiramente por 1 hora e depois por 3 horas diárias de exercícios funcionais envolvendo o membro superior parético, enquanto o outro membro sadio permanecia contido em uma tipóia.Para a avaliação da qualidade de vida foi utilizado o questionário SF-36 e para a funcionalidade foi utilizado o Índice de Barthel antes e após o termino da TCI. Na análise estatística foi utilizado o teste T-Student pareado com nível de significância de 0,05 e 0,1. Resultados: Os resultados permitiram demonstrar através da análise estatística da qualidade de vida após uma hora de aplicação da TCI um nível de significância de 0,1 com um t-tabelado de 1,90 e t - calculado 2,12 com 7 graus de liberdade. Após a intervenção de 3 horas, o t-calculado foi de 0,31 quando comparado com os dados de 1 hora, ao analisar os dados antes da terapia de 1 hora com os dados após 3 horas foi observado um t - calculado de 2,15. Na funcionalidade após 1 hora de TCI observou um escore de 95 e após as 3 horas da terapia este escore se manteve. Conclusão: Foi possível observar melhora na independência funcional e na qualidade de vida de pacientes hemiparéticos após a aplicação da terapia induzida por contensão.

PALAVRAS-CHAVE: Terapia Induzida por contensão. AVE

PUBLICAÇÃO NO FIEP BULLETIN ON-LINE: http://www.fiepbulletin.net/80/a2/36