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EFFECT OF CONSTRAINT INDUCED MOVEMENT THERPY IN STORKE REHBILITATION

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ABSTRACT **INTRODUCTION:** Stroke is most common in hypertensive patients in old age. This definition of stroke is the reversibility of tissue damage and was devised for the purpose, with the time frame of 24 hours being chosen arbitrarily. The 24-hour limit divides stroke from transient ischemic attack, which is a related syndrome of stroke symptoms that resolve completely within 24 hours. Various physiotherapy techniques used for the rehabilitation after stroke. Constraint induced movement therapy is from one of the technique used for stoke rehabilitation. Constraint Induced Movement Therapy is a new treatment technique that claims to improve the arm motor ability and the functional use of a paretic arm - hand. Constraint Induced Movement Therapy focus the use of the affected side by restraining the unaffected side. It is observed that patients with hemiparesis did not use their affected extremity (hemi -neglecting). The application of the method is the patients wear a mitt on the unaffected arm 90% of their waking hours and perform repetitive exercises with the more affected arm six to seven hours per day during two to three weeks

OBEJECTIVE: The objective of this project is to determine the effects of constraint induced movement therapy in stoke rehabilitation.

CONCLUSION: It can be concluded from the present study that Constraint Induced Movement Therapy might be beneficial than traditional rehabilitation therapy in stroke. These findings from the articles which are included in the study have clinical significance for the rehabilitation of patient within stroke. These articles shows significant effects of constraint induced movement therapy in Stroke Rehabilitation.

KEYWORDS : Constraint Induced Movement Therapy (CIMT), Stroke Rehabilitation

Introduction

The reversibility of tissue damage and was devised for the purpose, with the time frame of 24 hours being chosen arbitrarily. The 24-hour limit divides stroke from transient ischemic attack, which is a related syndrome of stroke symptoms that resolve completely within 24 hours.[1] Strokes can be classified into two major categories: Ischemic and Haemorrhagic Ischemic-In an ischemic stroke, blood supply to part of the brain is decreased, leading to dysfunction of the brain tissue in that area. Hemorrhagic-Hemorrhagic strokes result from the rupture of a blood vessel or an abnormal vascular structure.[1]

Medical Management for stroke- Thrombolysis, such as with recombinant tissue plasminogen activator (rtPA), in acute ischemic stroke, when given within three hours of symptom onset results in an overall benefit of 10% with respect to living without disability.[2][3] It does not, however, improve chances of survival.[2] Benefit is greater the earlier it is used.[2] Between three and four and a half hours the effects are less clear.[3] Surgical causing the ischemic stroke may improve outcomes if done within 7 hours of the start of symptoms in those with an anterior circulation large artery clot.[4][5] It however does not change the risk of death.[6] Significant complications occur in about 7%.[7] Intravenous thrombolysis is generally used in patients even if they are being considered for mechanical thrombectomy.[8][9] Certain cases may benefit from thrombectomy up to 24 hours after the onset of symptoms. [10]

CIMT forces the use of the affected side by restraining the unaffected side. Patient with hemiplegia can learn to improve the motor ability of the affected parts of their bodies and thus cease to rely exclusively or primarily on the affected parts.[11]

The unaffected arm-hand was immobilized in a sling,but soon an emphasis on intensive, repetitive training (massed practice) of the affected arm- hand evolved. In the current application of the method, the patients wear a sling/mitt[13] on the unaffected arm 90% of their waking hours and perform repetitive exercises with the affected arm six to seven hours per day during two to three weeks. [14][15]

Gert Kwakkel, et al., 2016. Showed that Constraint-induced movement therapy (CIMT) is developed to overcome upper limb impairments after stroke and is the most investigated intervention for treating stroke patients in the previous decades. This review describes the current evidence regarding: original CIMT and modified versions of CIMT (mCIMT). Meta-analysis showed strong evidence favouring both types of CIMT in terms of motor function, arm-hand activities and self-reported arm-hand functioning in daily life, immediately after treatment and at long-term follow-up, whereas no evidence was found for constraining alone (Forced Use (FU) therapy). No evidence was found that type of CIMT, intensity of practice or timing did affect outcome. Although the underlying mechanism that drive (m)CIMT is still poorly understood, recent kinematic conducted studies suggests that improvements introduced by original CIMT or mCIMT are mainly based on adaptation by learning to optimize the use of intact end-effectors by selecting patients with some voluntary motor control of wrist and finger extensors post stroke.

Xi-hua Liu, et al, 2017. The present meta-analysis study demonstrated that CIMT or mCIMT might be more beneficial than traditional rehabilitation therapy in the acute and sub-acute stroke. Furthermore, LO CIMT may be better than HI CIMT. These findings might have clinical significance for the rehabilitation of patients within acute or sub-acute stroke. However, large-scale, well-designed multi-centre studies are needed to further confirm the impact that degree of CIMT or mCIMT has on functional outcomes in acute and sub-acute stroke.

Boake C, et al, 2007 Future trials of CIMT during early stroke rehabilitation need greater statistical power, more inclusive eligibility criteria, and improved experimental control over treatment intensity. The relationship between changes in motor function and in evoked motor responses suggests that motor recovery during the 1st 3 months after stroke is associated with increased motor excitability of the affected cerebral hemisphere.

Sirtori V, et al, 2009. CIMT is a multifaceted intervention: the restriction to the normal limb is accompanied by a certain amount of

exercise of the appropriate quality. It is associated with a moderate reduction in disability assessed at the end of the treatment period. However, for disability measured some months after the end of treatment, there was no evidence of persisting benefit. Further randomised trials, with larger sample sizes and longer follow up, are justified.

Dromerick AW et al, 2000. A clinical trial of CIM therapy during acute rehabilitation is feasible. CIM was associated with less arm impairment at the end of treatment. Long-term studies are needed to determine whether CIM early after stroke is superior to traditional therapies.

Steven L.et at, 2002 Therapies based on repetitive practice of functionally related tasks to reduce impairment and improve function in the UEs of patients who have sustained a stroke are gaining recognition within the neurorehabilitation community. CI therapy that requires patients to use their impaired UEs intensely is among the approaches for selected patients. This approach is capturing increasing interest and is of fundamental scientific and clinical importance because of its basic scientific and theoretical foundations. Mechanisms to explain the improvements that are seen with CI therapy have exploited emerging technologies, including neurophysiological mapping in nonhuman primates, PET, fMRI, and transcranial magnetic stimulation in humans. TMS has lent some insight into potential explanations for cortical reorganization and represents a viable avenue that will allow additional understanding of physical therapeutic interventions.

Miltner WH, et al, (1999) Patients showed a significant and very large degree of improvement from before to after treatment on a laboratory motor test and on a test assessing amount of use of the affected extremity in activities of daily living in the life setting (effect sizes, 0.9 and 2.2, respectively), with no decrement in performance at 6-month follow-up. During a pretreatment control test-retest interval, there were no significant changes on these tests.

Wenqing Wang, et al. 2012, constraint-induced movement therapy of the lower extremity can promote the recovery of motor function after stroke and alter brain neuronal plasticity; this conclusion still needs to be confirmed by large-sample clinical studies. Further research is necessary to clarify the mechanisms underlying the reorganization of motor function to permit the selection of effective treatment strategies.

Bonaiuti D, et al. 2007, The literature search found 13 randomised controlled trials (RCTs), 4 of which were excluded because they aimed at comparing different intensity of CIMT. The 9 RCTs finally included into the review applied the CIMT in either acute, subacute or chronic stroke patients and according to different modalities. Findings were positive in all studies, but the MCID was reached only in smaller ones, which may have been influenced by patients' characteristics.

Steven L. Wolf, et al. 2008, Constraint-Induced Movement therapy (CIMT) uses a variety of treatment components, including restricted use of the better upper extremity, to promote increased use of the contralesional limb for many hours each weekday over two consecutive weeks. The EXCITE Trial demonstrated the efficacy of this intervention for patients 3-9 months post-stroke who were followed for the next 12 months. We assessed the retention of improvements through 24 months.

Lumy Sawaki, et at. 2008, Both experimental and control groups demonstrated improved hand motor function 2 weeks after baseline. The experimental group showed significantly greater improvement in grip force after the intervention and at follow-up (P = .049). After adjusting for the baseline measures, the experimental group had an increase in the TMS motor map area compared with the control group over a 4-month period; this increase was of borderline significance (P = .053).

Schaechter JD, et al. 2002, Constraint-induced movement therapy (CIMT) is a physical rehabilitation regime that has been previously shown to improve motor function in chronic hemiparetic stroke patients. However, the neural mechanisms supporting rehabilitation-induced motor recovery are poorly understood. The goal of this study was to assess motor cortical reorganization after CIMT using functional magnetic resonance imaging (fMRI). In a repeated-measures design, 4 incompletely recovered chronic stroke patients treated with CIMT underwent motor function testing and fMRI. Five age-matched normal subjects were also imaged

Taub E, et at. 2006, After CI therapy, patients showed large (Wolf Motor Function Test) to very large improvements in the functional use of their more affected arm in their daily lives (Motor Activity Log; P<0.0001). The changes persisted over the 2 years tested. Placebo subjects showed no significant changes.The results support the efficacy of CI therapy for rehabilitating upper extremity motor function in patients with chronic stroke.

Lin KC, et al. 2010, The distributed form of constraint-induced therapy group exhibited significantly greater improvements in the Fugl-Meyer Assessment and Motor Activity Log than the control intervention group. The functional magnetic resonance imaging data showed that distributed form of constraint-induced therapy significantly increased activation in the contralesional hemisphere during movement of the affected and unaffected hand. The control intervention group showed a decrease in primary sensorimotor cortex activation of the ipsilesional hemisphere during movement of the affected hand.

Myint JM, et al. 2008, There were 23 and 20 subjects respectively in the constraint-induced movement therapy and control groups. Significant improvements were seen at post intervention and 12 weeks after constraint-induced movement therapy in functional level for hemiparetic upper extremity (P= 0.001), and in the ;amount of use' (P= 0.001) and ;how well' (P= 0.021) subscales of the Motor Activity Log. The total Action Research Arm Test score, grasp (P= 0.004), grip (P= 0.004), pinch (P= 0.032) and gross (P= 0.006) components showedsignificant improvement over the control group at post intervention. The grip component (P=0.019) and the total Action Research Arm Test score (P= 0.009) were superior to the control group at 12 weeks.

CONCLUSION

It can be concluded from the present study that Constraint Induced Movement Therapy might be beneficial than traditional rehabilitation therapy in stroke. These findings from the articles which are included in the study have clinical significance for the rehabilitation of patient within stroke. These articles shows significant effects of constraint induced movement therapy in Stroke Rehabilitation.

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