Motor recovery of the severely impaired paretic upper limb after mirror therapy in sub-acute stroke: A randomized controlled trial

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This study investigated on the effectiveness of high-dose-mirror-therapy (HDMT) on the motor recovery of severely impaired paretic upper limb (UL) in patents during sub-acute stroke. It was a prospective assessor-blind randomized-controlled-trial. Patients admitted for first superatentorial stroke for less than a month were included if they aged >35, presented with severe to moderate UL impairment and able to follow instructions. The exclusion criteria were visual impairment, cognitive impairment, aphasia, visual neglect, and history of impaired UL function. Subjects were randomized to HDMT or control (CT) group. In addition to conventional rehabilitation treatment, HDMT group received 2 sessions of 30 minutes MT daily, 5 days a week for 4 weeks. During MT, subjects performed a standardized bilateral ULs exercise (BULE) while watching the reflective image of the non-paretic UL from a mirror placed between the ULs.

The CT practiced the same BULE without mirror. The outcomes were Fugl-Meyer Assessment Upper Extremity (FMA-UE) and Wolf Motor Functional Test (WMFT) performed before and after the intervention. Within- and between group differences were analyzed by SPSS version 17 with level of significance at 0.05. Thirty-four subjects (HDMT=15, CT=19) completed the study. There was no difference between HDMT and CT within the demographic characteristics and baseline outcomes. Both HDMT and CT showed within-groups improvement in FMA-UE and WMFT after program but no between-groups difference showed.

HDMT wasn't superior in promoting motor recovery of the severely impaired paretic UL of patients during subacute stroke in comparison to CT involving similar intensity of BULE. This study aimed to look at the effectiveness of mirror therapy on recovery within the severely impaired arm after stroke.Using single-blind randomized controlled design, patients with severely impaired arm within 1-month post-stroke were assigned to receive mirror therapy (n = 20) or control therapy (n = 21), 30 mins twice daily for 4 wks additionally to standard rehabilitation. During mirror therapy and control therapy, subjects practiced similar structured exercises in both arms, except that mirror reflection of the unaffected arm was the visual feedback for mirror therapy, but mirror was absent for control therapy in order that subjects could watch both arms in exercise.

Fugl-Meyer Assessment and Wolf Motor Function Test were the result measurements. RESULTS:After the intervention, both mirror therapy and control therapy groups had significant arm recovery similarly in Fugl-Meyer Assessment (P = 0.867), Wolf Motor Function Test-Time (P = 0.947) and Wolf Motor Function Test-Functional Ability Scale (P = 0.676). CONCLUSION:Mirror therapy or control therapy, which involved exercises concurrently for the paretic and unaffected arms during subacute stroke, promoted similar motor recovery within the severely impaired arm.

Objective: This study aimed to examine the effectiveness of mirror therapy on recovery in the severely impaired arm after stroke. Stroke is a common cause of long-term disability among adults worldwide. Most patients with stroke experience varying degrees of dysfunction, and one major dysfunction is upper limb motor impairment. There is a need to develop effective neurorehabilitation interventions to optimize arm function and reduce disability in patients . Action observation therapy and mirror therapy are two prominent approaches targeting stroke motor and functional recovery, and both are supported by neuroscientific foundations. However, the relative treatment effects of the upper limb action observation therapy versus mirror therapy in stroke rehabilitation have not been compared.

The action observation therapy may be a developing rehabilitation approach supported the role of the mirror neuron system in motor learning. it's a motor-based technique with cognitive strategies concerning stroke motor recovery. The mirror neuron system is activated during both the execution and observation of an action and is that the area liable for the action observation therapy. The action observation therapy helps stroke patients improve motor skills through observing another individual's normal movements and practicing what they need observed. During the action observation therapy, the participants are commonly asked to carefully observe the actions performed by a healthy person in videos (i.e., the observation phase) then to physically practice an equivalent actions (i.e., the execution phase). Neural reorganization and motor relearning of patients commonly occur in response to different afferent inputs and visual feedback. The action observation therapy is aimed toward promoting these processes to enhance motor learning and performance in stroke patients. Recent studies have found positive effects of the action observation therapy on improving motor function and daily performance in stroke patients.

The mirror therapy was initially developed for alleviating illusion pain after amputation and has been applied to stroke rehabilitation within the past 20 years [19, 20]. The mirror therapy has gained much attention as a rehabilitation strategy to deal with patients' arm and hand function following a stroke. During the mirror therapy, the participants are instructed to observe the reflection of movements of the unaffected arm during a mirror as if it had been the affected one. The mirror therapy creates the illusory visual image that the intact arm is that the affected arm and is generally moving, so on enhance the movements of the affected arm. It provides visual and proprioceptive feedback of the intact arm, which can provide a substitute input for absent or reduced proprioceptive feedback from the affected arm . additionally , the mirror therapy could

be related to the mirror neuron system and promote reorganization and functional recovery. A growing number of studies have shown that the mirror therapy might be a beneficial approach for enhancing patients' motor and performance after stroke.

Design: Using single-blind randomized controlled design, patients with severely impaired arm within 1-month post-stroke were assigned to receive mirror therapy (n = 20) or control therapy (n = 21), 30 mins twice daily for 4 wks in addition to conventional rehabilitation. During mirror therapy and control therapy, subjects practiced similar structured exercises in both arms, except that mirror reflection of the unaffected arm was the visual feedback for mirror therapy, but mirror was absent for control therapy so that subjects could watch both arms in exercise. Fugl-Meyer Assessment and Wolf Motor Function Test were the outcome measurements.

Results: After the intervention, both mirror therapy and control therapy groups had significant arm recovery similarly in Fugl-Meyer Assessment (P = 0.867), Wolf Motor Function Test-Time (P = 0.947) and Wolf Motor Function Test-Functional Ability Scale (P = 0.676).

Conclusion: Mirror therapy or control therapy, which involved exercises concurrently for the paretic and unaffected arms during sub-acute stroke, promoted similar motor recovery within the severely impaired arm.