



APPLICATION OF MIRROR THERAPY IN PATIENTS WITH STROKE

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ABSTRACT

Purpose. The aim of the study was to investigate the effect of mirror therapy as a method of restoring damaged upper limb function in patients with ischemic stroke treated with venous thrombolysis.

Materials. Mirror therapy was administered to 10 thrombolized patients with ischemic stroke. The patients were treated in the neurological ward of the Multi-profile Hospital for Active Treatment-Blagoevgrad in the period from 2014-2015. After signing a declaration of informed consent of the patients, a Barthel index test was applied before and after hospitalization. The duration of the procedure is 15-20 minutes for 5 days and is part of the general kinesitherapy program. The Prizm statistical package was used for statistical data processing and graphical presentation.

Results. The mean age of the studied contingent was 67 ± 2.8 years. Our new and specialized method of kinesitherapy for the recovery of patients treated with venous thrombolysis confirms a significant positive effect (Wilcoxon, ANOVA).

Conclusion. The results of our research show that the application of the author's methodology with mirror therapy creates an opportunity to improve the functions in the damaged upper limb and improves the quality of life.

Keywords: intravenous thrombolysis, stroke, mirror therapy, neurorehabilitation, kinesitherapy,

INTRODUCTION

Mirror therapy is increasingly entering as a therapy that enables full recovery of patients who have experienced an acute cerebrovascular accident. In their desire for a full and quick recovery of the sick, teams of scientists conduct research and apply the therapy. Thieme H et al. (2018) performed meta-analyses tracking: the Cochrane Stroke Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, CINAHL, AMED, PsycINFO and PEDro, conference proceedings, trials and research registers, lists of reference materials, etc. The aim of the study was to summarize the effectiveness of mirror therapy compared to no treatment, placebo or sham therapy or other treatments in improving motor function and motor impairment after stroke. In addition, the effects of mirror therapy on activities of daily living, pain, and visuospatial neglect are evaluated. Sixty-two studies with a total of 1,982 participants were reviewed. The results point to evidence for the effectiveness of mirror therapy in improving upper extremity motor function, motor impairment, activities of daily living and pain, at least as an adjunct to conventional rehabilitation for people after stroke. The main limitations are the small sample sizes and lack of reporting of methodological details, leading to uncertainty [1]. Authors Gandhi DB et al. (2020) review, systematically reviews, and present current perspectives on mirror therapy and its application in stroke rehabilitation, as well as dosage, feasibility, and acceptability in stroke rehabilitation. An electronic database search was performed on Google, PubMed, Web of Science, etc., with 3871 results generated. After screening based on the inclusion and exclusion criteria, 28 studies were included in this review. The conclusion drawn by the team of scientists is that mirror therapy appears to be an effective and feasible approach for the rehabilitation of stroke survivors in the acute, subacute and chronic phases of the stroke, although its long-term effects and impact on daily activities need to be thoroughly analyzed [2]. Pérez-Cruzado D, et al. (2016) con-

ducted a systematic review of information on the application of mirror therapy in Pubmed, Scopus and SciELO databases. From the fifteen studies that were reviewed, the authors concluded that upper extremity recovery, upper extremity function, and general manual dexterity were often measured in these studies, and mirror therapy assisted in the recovery of impaired limbs [3]. Samuelkamaleshkumar S et al. (2014) investigated the effectiveness of mirror therapy combined with bilateral hand training and graded activities to improve motor performance in the paretic upper limb after stroke. The researchers reached the following very good, three-week results – recovery was significantly better in the mirror therapy groups than in the control group. For the assessment of the Fugl-Meyer test ($P=.008$), Brunnstrom stages of motor recovery for the hand and palm ($P=.003$) and the Box and Block Test ($P=.022$). No significant difference was found between groups for the modified Ashworth scale ($P=.647$) [4]. Madhoun HY et al. (2020) conducted a randomized trial investigating the effect of mirror therapy, comparing it with occupational therapy in moderate and severe upper limb disability by analyzing motor function and activities of daily living in patients with subacute stroke. The first group received mirror therapy, while the control group received only occupational therapy, whereas both groups received conventional therapy. The intervention time was the same for both groups and consisted of 25 minutes per day for 25 days. Fugl-Meyer score (FMA), Brunnstrom score (BRS), modified Barthel index (MBI) and modified Ashworth scale (MAS) were used to evaluate the results of this study. After 25 treat-

ment sessions, patients in both groups showed improvement in activities of daily living, motor recovery and motor function. No significant differences were observed between the two groups on BRS and MBI. However, interestingly, the results of the mirror therapy group of patients were significantly better than the control group in FMA ($P<0.05$) and some aspects of MAS (elbow flexion, wrist flexion, wrist extension and finger extension with $P<0.05$). This study shows that the combination of conventional rehabilitation treatment and mirror therapy is an effective way to improve functional recovery in upper extremity stroke patients [5]. Arya KN and co-authors sought to determine the effect of task-based mirror therapy on upper extremity stroke recovery. Thirty-three patients were studied and allocated to receive either mirror therapy or standard kinesitherapy - 40 sessions (5/week) over a period of 8 weeks. The results of the study. The team of scientists came to the conclusion that the patients who received mirror therapy significantly improved the motor recovery of the wrist and hand in post-stroke hemiparesis. Tasks using MT can be used as an adjunct to stroke rehabilitation [6]. Pervane Vural S et al., in their study, included mirror therapy as autogenous upper and lower extremity training, which has been successfully used for the recovery of stroke patients [7]. Filipova, in her scientific work, offers a methodology of kinesitherapy in which, in addition to a standard kinesitherapy program, the application of kinesio tape and mirror therapy is added. In addition to the upper limb, this therapy is also applied to the lower limb.

Fig. 1. Kinesiotape for upper lim.



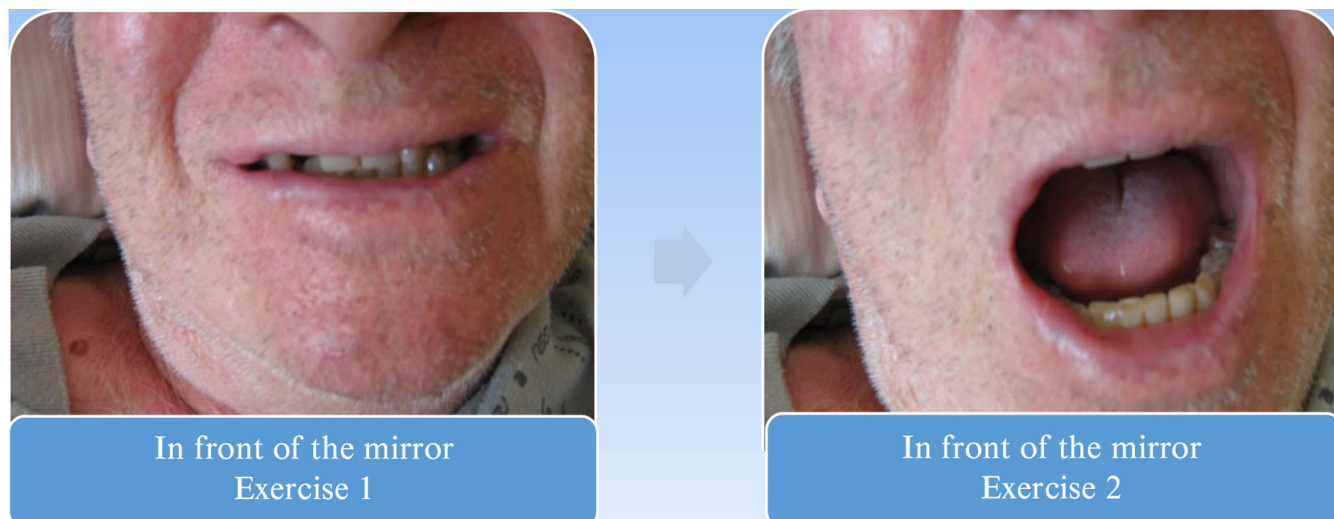
There is a statistically significant difference and recovery of active movements in ischemic stroke patients who are thrombosed and have motor deficit-hemiplegia [8].

The aim of the study was to investigate the effect of mirror therapy as a method of restoring damaged upper limb function in patients with ischemic stroke treated with venous thrombolysis.

MATERIALS AND METHODS

Materials. Mirror therapy was administered to 10 thrombolized patients with ischemic stroke. The patients were treated in the neurological ward of the Multi-profile Hospital for Active Treatment-Blagoevgrad in the period from 2014-2015. After signing a declaration of informed consent of the patients, a Barthel index test was applied before and after hospitalization.

Fig. 2. Mirror therapy for VII facial nerve-lower brunch for pacient with ischemic stroke treated with intravenous thrombolysis



The duration of the procedure is 15-20 minutes for 5 days and is part of the general kinesitherapy program. The results were compared with 10 patients who were not thrombosed with intravenous thrombolysis and did not receive mirror therapy. The Prizm statistical package was used for statistical data processing and graphical presentation. Non-parametric statistics were used to visualize and analyze the results

RESULTS

The mean age of the studied contingent was 67±2.8 years. Our new and specialized method of kinesitherapy for the recovery of patients treated with venous thrombolysis confirms a significant positive effect (Wilcoxon, ANOVA).

Table 1. Dynamics of Barthel index results in the experimental group

Table Analyzed	Data Table-1 Columns A and B
Unpaired t-test	
P value	P<0.0001
P value summary	***

At the beginning of the study, in both groups, there was a visible motor deficit and low points were present when examining the Barthel index - table 1. At discharge, however, we notice a significant increase in activities and activities of daily living. We attribute this result not only to the neurorehabilitation but also to the applied venous thrombolysis up to 3 hours after a cerebrovascular accident.

DISCUSSION

The search for a solution for the rehabilitation of ischemic stroke patients who are thrombolytic remains a major challenge. Idiomotor training, such as mirror therapy, as part of a kinesitherapy program supports patients' recovery. Helping these patients regain their active movements through diagonal spiral recovery models, balance and coordination exercises, locomotor exercises will also significantly improve their quality of life

CONCLUSION

Although the follow-up period of these patients is too short - only 5 days, we consider that the obtained data do not limit their reliability due to the fact that with applied venous thrombolysis, the kinesitherapeutic potential in stroke patients significantly increases. With the addition of a kinesitherapy program, specialized tests report satisfactory results. The results of our research show that the application of the author's methodology with mirror therapy creates an opportunity to improve the functions in the damaged upper limb and improves the quality of life.

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