Effectiveness of specific corrective training related to right-left discrimination in post stroke survivors

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ABSTRACT

Background- An ischemic stroke happens when there is a reduction or interruption in the blood supply to a part of the brain, depriving the brain tissue with oxygen and nutrients. Necrosis is observed within minutes after the stroke. Since an ischemic stroke is a medical emergency, prompt treatment is crucial. Prompt intervention can mitigate brain injury and avert additional consequences. Studies reveal that people who have had a stroke frequently lose their ability to distinguish between left and right body part discrimination. This characteristic of post-stroke survivors stays undetected and untreated because of a lack of knowledge regarding right-left discrimination and how to address it therapeutically throughout recovery. Therefore, the protocol or treatment plan that is developed for patients with such psychosomatic disorders will benefit from this study.

Methodology- The study was conducted at KIMSDU, Karad. 90 patients out of 100 subjects were selected as per the inclusion and exclusion criteria. A protocol for 3 weeks was followed by the patient which included pre and post assessed using the BRLD test. The patient underwent the protocol which included subjective, objective and functional tasks. The study was intervened positively with significant improvement in patients with left-right discrimination. **Result**- The age group 40-49 consists of 30 subjects. Out of 90 subjects 73 were males and 17 were females. Out of 90 subjects 3 were in stage 5, 17 were in stage 4, 40 in stage 3 and 20 in stage 2. There is improvement in BRLD test with difference of 10.098 after post assessment with significant p value of <0.0001. **Conclusion**- Specific corrective training is effective in managing the problems related to right-left discrimination in post stroke survivors.

Keywords- Stroke, left and right discrimination, BRDL test

INTRODUCTION

A stroke happens when there is an obstruction in the blood supply to the brain or when a blood vessel in the brain bursts and bleeds. The brain's tissues cannot receive blood or oxygen due to the rupture or obstruction. (1) Ischemic The most prevalent kind of stroke, which affects 80% of cases, is caused by a clot that obstructs or reduces blood flow, depriving the brain of vital

nutrients and oxygen. (2,3) Hemorrhagic strokes happen when blood arteries burst, allowing blood to seep into or around the brain. (2,3) Clinically, a range of focused abnormalities can occur, such as altered consciousness and deficiencies in motor, cognitive, perceptual, sensory, and language abilities.

For neurological abnormalities to be categorized as stroke, they must last for a minimum of twenty-four hours. Hemiplegia (paralysis) or hemiparesis (weakness), usually on the side of the body opposite the injury, are the hallmarks of motor impairments. Hemiplegia is a term that is frequently used to describe a broad range of motor impairments following a stroke. (1, 2, 3) The degree of neurological abnormalities in a given patient depends on the location and severity of brain injury, collateral blood flow, and prompt acute care management. Neurological deficits that continue longer than three weeks are referred to as residual and have the potential to cause permanent disability.[(3)]There are three ways to categorize strokes: vascular territory (such as anterior cerebral artery syndrome, middle cerebral artery syndrome, and so on), etiological categories (such as thrombosis, embolus, or hemorrhage), and management categories (such as transient ischemic attack, minor stroke, major stroke, deteriorating stroke, young stroke). (2)

Identifying and treating the major neuropsychiatric illnesses that follow a stroke has received relatively little attention. This review covers the epidemiology of depression, anxiety disorder, catastrophic reactions, pathological affect, and psychosis following a stroke, as well as their clinical and pathological correlations. Depressive condition and anxiety disorder have been demonstrated to impair physical recovery from stroke. Other mental illnesses probably hinder healing and lower quality of life as well. Very few controlled trials are available to evaluate the efficacy of therapies for these diseases following a stroke. (4) Rehabilitation might support you with your strength, mobility, speech, and everyday living skills, depending on which areas of your brain were damaged by the stroke. You can enhance your quality of life and restore your independence with the aid of stroke rehabilitation.

Consequently, everyone who has experienced a stroke is advised to undergo stroke rehabilitation. (5) For patients who have suffered brain damage, even those whose motor abilities have restored, cognitive and perceptual impairments are among the main reasons for inadequate rehabilitation outcomes. It is essential to think, recall, reason, and make sense of

the environment around us in order to do daily tasks. Problems with these capacities can have a disastrous impact on a person's life as well as the lives of their family members. These persons might not be able to maintain connections with others, support a family, or carry out the duties of a paid job. An understanding of perception and cognition is essential for the effective treatment of many patients suffering from brain damage. (2)

Studies reveal that people who have had a stroke frequently lose their ability to distinguish between left and right body part discrimination. This characteristic of post-stroke survivors stays undetected and untreated because of a lack of knowledge regarding right-left discrimination and how to address it therapeutically throughout recovery. Therefore, the protocol or treatment plan that is developed for patients with such psychosomatic disorders will benefit from this study.

METHODOLOGY

The Protocol Committee and the Institutional Ethics Committee of KIMSDU, Karad reviewed the study protocol before approving it. Following that, potential individuals were contacted, the goal of the study was described, and those who were willing to participate had their signed consent obtained. In accordance with the inclusion and exclusion criteria, subjects were chosen. Pre-test Assessment: Bergen left-right discrimination test was used for the assessment. The treatment plan employs a compensatory strategy; instead of using the terms "right" and "left" when instructing the patient, it may be more useful to point or give cues that use distinctive characteristics of the limb, such as "the arm with the watch."

These recommendations are especially important for therapists who teach transfers or locomotion because unclear instructions can have harmful effects. Any common object, including clothes and shoes, should have red tape or seam binding labeled on the right side. (2) In order to be classified as "normal," left/right judgement tasks must fall within a specific range of accuracy (% of correct responses) and speed (average response time in seconds). For necks and backs, a pace of 1.6 seconds +/- 0.5 seconds seems to be very common. The average pace of the hands and feet is 2 seconds +/- 0.5 seconds, which is a little slower. These numbers lead us to believe that additional body parts, such the shoulders and knees, should be done in about two seconds. (2,3)

Protocol was given in three phases such as subjective phase (10 min), objective (5 min) and Functional activities with direction command (10 min)

Subjective phase: Inquiries about the patient in a language that they can comprehend about themselves, the surroundings, or broader topics. Among the queries are A left or a right? Has it shifted to the right or left? You should indicate whether the body part has twisted, turned, or shifted to the left or right for all spinal and facial exercises (backs, necks, and faces). Is he leaning left or right, for instance? Which hand is your watch in? Which side has the restroom/dressing room? Which hand do you use for scissors, and which side do you pass on the road? In no more than ten minutes, the therapist must attempt to address as many questions as possible.

Objective phase- Subject will be given play cards or flash cards of body images in various positions, the subject must tell or mark the side asked.

Functional activities with direction command- Your goal is to identify which body part is from the left or right side by performing these exercises with the hands, feet, knees, and shoulders. Is it the left shoulder or the right shoulder, for instance? Simple instructions like tucking in your shirt on the right side, combing your hair on the left, and opening the door with your right hand are offered. Start by focusing on one task at a time at first. You can assign two to three tasks in a session. The therapist may combine two tasks, such as walking from your right side and opening the left window, to make the activity more difficult as it advances.

Fig 5. (A) **Fig 5. (B)**

Fig 5.A, B: patient performing functional activities following right-left commands

RESULTS

Table 1: Age Distribution

Age	No. of individuals
21-29	2
30-39	13
40-49	30
50-59	24
60-69	10
70-79	9
80-90	2

Table 1. represents seven age groups. The age group 40-49 consists of more subjects.

Gender	No. of Individuals
Male	73
female	17

Table 2: Gender Distribution

Table 2. represents, a total of 90 subjects were taken for the study. Out of 90 subjects 73 were males and 17 were females.

Table 3: **BRUNNSTROM RECOVERY GRADING**

Brunnstrom recovery stage	No. of individuals
stage2	30
stage3	40
stage4	17
stage5	3

Table 3. represents, a total of 90 subjects were taken for the study. Out of 90 subjects 3 were in stage 5, 17 were in stage 4, 40 in stage 3 and 20 in stage 2

Table 4: Pre-post assessment of BRLD test

	BRLD test	
	pre	Post
Mean ±SD	8.011±4.790	18.109±5.743
p value	<0.0001	

Table no 4. shows that there is improvement in BRLD test with difference of 10.098 after post assessment with significant p value of <0.0001.

DISCUSSION

The purpose of the study was to determine how particular corrective training affected post-stroke survivors' issues with discriminating on the left and right. Discrimination based on right-left body identification is the process of perceiving one side of the body as being different from the other. Studies reveal that people who have had a stroke frequently lose their ability to distinguish between left and right body part discrimination. This is reinforced by Haike E. Van Stralen, et al; who researched body representation issues predict left right orientation difficulties following stroke. In patients who had recently suffered a stroke, the study looked at the relationship between left right orientation (LRO) impairments and somatosensory related deficits, ranging from primary somatosensory impairments to body representation impairments. The study included 48 age-matched healthy controls and 47 stroke patients who were being assessed for the first time. LRO was evaluated with the Bergen Right Left Discrimination Test (BRLD). In a logistic regression analysis, impairments on higher order somatosensory function (finger gnosis, subjective sense of body ownership), primary somatosensory function (touch perception, proprioception), and other cognitive functions (language, attention & working memory, visuospatial neglect) were entered as predictors. The aforementioned study provides evidence that a lack of knowledge regarding right-left discrimination and its treatment strategy during rehabilitation contributes to the undiagnosed and untreated state of post-stroke survivors. (2)

The patient's state of consciousness determined the study's inclusion and exclusion criteria. It was anticipated that the sample subject would be cognizant (CSG greater than 10). Brunnstrom's recovery stages served as the other outcome measure for the inclusion criterion, and subjects at stage 2 and higher were selected. The study's inclusion and exclusion criteria were selected with the understanding that prompt detection of left-right discrimination will facilitate the patient's quick recovery through early intervention.

The outcome measure used to identify and monitor left-right discrimination in stroke survivors is called the BRLD Test. The BRLD is a pencil-and-paper exam that provides three varying degrees of difficulty for neuropsychological assessments of LRD performance. The BRLD form A (BRLD-A) utilized in this investigation was the same as the initial BRLD version created by Ofte and Hugdahl (2002a). It is composed of sequences of stickmen stimuli, where

the front or rear is displayed. Participants are requested to mark each stickman's left or right hand with a pencil.

The letter "R" (for right) or "L" (for left) is printed beneath each stickman object to help subjects understand which hand of the stickmen needs to be marked with a pencil. The only true, dependable, and non-digital method for eliminating left-right discrimination is the BRLD test. Numerous digital tools exist that have similarities to the BRLD test, like recognize and orientate tests.

This investigation proved useful in treating patients with such psychosomatic disorders and in developing protocol specific to right-left discrimination. (2) Graded Motor Imagery was consulted and the unique remedial training program for right-left discrimination was developed based on its principles. The most advanced rehabilitation method for treating a variety of complicated pain and mobility issues is called Graded Motor Imagery (GMI), and it is based on the most recent research and clinical testing. The study was carried out at Karad's Krishna College of Physiotherapy. Ninety of the one hundred post-stroke survivors were chosen based on the inclusion criteria, and they received three weeks of treatment. The Bergen left-right discrimination test (BRLD) was used to assess patients before and after treatment, and the findings were analyzed.

Ninety post-stroke survivors participated in the study, of whom only 19% were female and 81% were male. The majority of the participants (60%) were in the 40–60 age range. Over the course of the study, which lasted a full year, patients who had been subjected to left-right prejudice significantly improved. Utilizing the Wilcoxon matched-pairs signed-ranks test, data was statistically analyzed. With a two-tailed P value of less than 0.0001, the Bergen left-right discrimination test in post-stroke survivors is deemed very significant. The test was administered both before and after the intervention. Patients with left-right discrimination exhibit notable improvements in their physical and cognitive abilities.

Additional benefits of these treatments include increased levels of alertness and attention, as well as a quicker responsiveness to command than before.

CONCLUSION

On the basis of result of the study, it proves that the post stroke patient face laterality recognition problems for which they are unaware. The older studies and previous literature convey us that post stroke patients suffer from left-right discrimination and there are approaches that can improve the problems related to same. But most researches and literature lack in giving a proper treatment protocol or rehabilitation to improve such conditions. The study was made in effort to have such treatment plan and to find its effectiveness. The study concludes that the specific corrective training is effective in managing the problems related to right-left discrimination in post stroke survivors.

LIMITATIONS OF THE STUDY

Selecting inclusion and exclusion criteria for the sample collection is difficult because of the acute symptoms of stroke have altered level of consciousness which may misinterpret with disoriented and left-right discrimination. The patients with involvement of speech needs other way to answer during subjective training, the patient with sensory aphasia may lead to confusion to patient and often answers wrongly. The BRLD test is complex and difficult to understand and many repetitions are required to make the patient understand.

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