

## CASE REPORT-

### Title: - EFFECT OF PHYSIOTHERAPY ON HAND REHABILITATION IN ACUTE ISCHEMIC STROKE SURVIVOR: A CASE REPORT

#### ABSTRACT:

**Background:** Ischemic injury to the brain caused by a sudden drop in blood supply causes over 80% of strokes. Large artery blockage occurs in about 25-35 percent of strokes, and patients in this category often have severe neurological impairments. The prognosis is bleak if treatment is not started right away. Imaging of the brain after a stroke is crucial for determining the extent of tissue damage and guiding treatment.

**Aim:** To determine the effect of early hand rehabilitation post ischemic stroke.

**Presentation of case:** A 35-year-old woman with a history of hypertension acquired aphasia, left hemiplegia, and hemisensory loss all at the same time. She was sent to the hospital's emergency room. On CT the blockage of the right middle cerebral artery revealed an acute ischemic stroke. The Motor Assessment Scale is taken in which there is a hand function domain also to assess it.

**Discussion:** There are many studies on hand rehabilitation, but usually we stated hand rehabilitation late. Our primary focus during rehabilitation is upper limb and lower limb, hand is a little neglected part.

So, in this case study we will be focusing on early had rehabilitation. **Conclusion:** The case data confirms a diagnosis and appropriately planned physical rehabilitation care that resulted in a progressive improvement on STREAM Score, Motor Assessment Scale Score, Barthel index score and WHO-QOL score.

**KEY WORDS:** Acute ischemic stroke, MCA (middle cerebral artery) Infarct, Hemiplegia,

## **INTRODUCTION:**

Ischemic stroke results in neurological deficit as the blood supply to that specific portion of brain is **disturbed** and is suddenly cut off, resulting in a loss of neurologic function. Strokes are **of different types**; Ischemic stroke, Haemorrhagic stroke and Transient ischemic attack .(1)

The stroke involved **d** in this case is acute ischemic stroke. Commonest affected artery is the Middle Cerebral Artery (MCA) which is the branch of internal carotid artery. These arteries carry blood to the frontal, temporal, and parietal lobes of the brain, as well as deeper regions such as the caudate, internal capsule, and thalamus. Because of its broad supply, strokes impacting the MCA area can present with a wide range of symptoms, depending on which branches and structures are affected. Stroke results in hemiparesis and the severity depends on the area involved and the extent of lesion.

There are several risk factors for stroke, which can be classified as modifiable or unmodifiable-many of the causes of hemorrhagic and ischemic stroke overlap. Age, gender, ethnicity, and genetics are nonmodifiable risk factors for each. The risk increases with age; the danger is higher in males at a younger age, while women have a higher total chance of mortality(2). One of the major complication faced by an individual of stroke due to middle cerebral artery is reduction in mobility due to damage of premotor cortex as the premotor cortex (PMC) (Brodmann 6) contributes uniquely to proximal upper and lower limb power and plays a role in the organization of motor behaviours (3). **In MCA infarct the upper limb is**

more involved and thus hand functions are compromised. So, our aim is to initiate early hand rehabilitation for achieving maximum hand functions. In this case we started physiotherapy rehabilitation within 3-4 days for hand.

#### **PATIENT INFORMATION:**

A 35 years old female patient, is a house wife with a dominant right hand, she had started feeling weakness in the left arm from 16/9/2021, for which she visited to private clinic. On the next day in the morning patient had difficulty in tying her scarf and speaking like a child. Hand grip was affected. On 26/9/2021 patient was admitted in ICU of Acharya Vinoba Bhave hospital in Sawangi. After 4 to 5 days patient was shifted to general ward. On 5/10/2021 patient was discharged. After some days patient again felt difficulty in eating, with weakness of the left side of the body. Patient again came to hospital and was suggested with CBC and urine test as she also has difficulty in urination (burning micturition). Initially patient's left arm became weak followed with left leg. After some time face tilted on left side.

#### **CLINICAL FINDINGS:-**

Patient was conscious and oriented as assessed by MMSE. A proper informed consent was taken from patient prior.

On observation; the attitude of limb in supine position, pillow under head, upper extremity was extended and externally rotated. In lower extremity, hip was in slight flexion and knee in flexion with external rotation.

Posture :- Assisted by relatives for sitting as patient was not able to sit independently. On observation of posture on assisted sitting is that the scapula was retracted of left side, shoulder was externally rotated and extended. Pelvis was tilted back. Hip and knee in flexion

with left ankle in plantarflexion. On examination cranial nerves were intact and special sense of hearing and vision were normal but patient is having global aphasia.

Tone examination on Modified Ashworth Scale left side was hypertonic for upper limb and lower limb while right side was normal

Sensory examination:- Superficial and Deep sensation were intact and cortical sensation were impaired.

Tone:-

Muscle tone (MAS)	Right side	Left side
Upper limb Shoulder	NORMAL	Grade 1+
Elbow	NORMAL	Grade 1
wrist	NORMAL	Grade 1+
Lower limb Hip	NORMAL	Grade 1
knee	NORMAL	Grade 1+
Ankle	NORMAL	Grade 1

Reflex:-

Superficial reflex	Right side	Left side
Planter response	NORMAL	Babinski positive
Abdominal response	NORMAL	Diminished (+)

Deep Tendon Reflexes are normal on right side and diminished on left side.

Investigation :- CT scan and MRI was done on 26 Sept 2021. The reports revealed a right (middle cerebral artery) infarct.

**Timeline :-**

<b>Date of this Out Patient Department visit</b>	<b>16/10/2021</b>
<b>Date of start of physiotherapy</b>	<b>18/10/2021</b>
<b>Date till the report</b>	<b>22/10/2021</b>
<b>Last date of rehabilitation</b>	<b>Still ongoing</b>

## **INTERVENTIONS:**

The rehabilitation protocol will be of 10 weeks of duration for 5 times a week.

- Bed mobility exercises –rolling from supine to side lying to non-affected side has been started to prevent the bed sore and to become the patient functionally active.
- Proprioceptive Facilitation Techniques- for upper limb- Joint approximation has given 10 repetitions with 30 second hold during treatment.
- Inhibitory Pressure – for upper as well as lower limb- upper limb is placed on two pillows one under arm and another under forearm, so that the upper limb was elevated and thus there will be continuous pressure felt on shoulder joint.
- For lower limb- one pillow was placed under thigh and one under calf and thus the joint pressure will be felt on hip joint.
- Functional electrical stimulation (FES): FES was started for 30 minutes for upper limb. It will help in reducing the spasticity, pain and increase the range of motion.(9).
- Modified Constraint-Induced Therapy- will be given for approximately 10-week period, 3 times a week for 30 minutes, when the patient will be able to move her wrist and fingers voluntarily.(4)
- Brunnstrom approach, Roods approach and NDT for postural as well as balance training has started.
- All these approaches all together in combination have started.

- For speech patient is taking training from speech therapist.
- Also for gait training as soon as the patient will gain control on static and dynamic standing balance body weight treadmill will be started for 15 minutes for 5 days a week.

### **Follow-up and outcomes:**

Primary outcome measure is STREAM Score- The scale is a execution-based measure to assesses voluntary movement of extremities and mobility following a stroke. It measures the amplitude and quality of movement. The reliability of scale is excellent and individual item inter-rater reliability is moderate to excellent with kappa scores ranging from 0.55 to 0.94.

Motor Assessment Scale Score-This is developed to assess the give back of function following a stroke or other neurological impairment. This scale assesses the patient with hypotonia, to developing spasticity and movements in synergy and then breaking that synergy pattern to normal development of upper limb, lower limb and normal development. The test looks at a patient's ability The higher the score – the higher functioning the patient is on the affected side.

High Score: 54

Low Score: 0

Secondary outcome measure is Barthel index and WHO-QOL

The STREAM Score was taken on the 1<sup>st</sup> day of rehabilitation and then will be taken at 5<sup>th</sup> week and on 10<sup>th</sup> week.

The Barthel index- is to assess the activity of daily living of a patient.

WHO-QOL- The WHO Quality of Life scale assesses the **Physical health, Psychological, Social relationships, and Environment.**

These outcomes was taken on 1<sup>st</sup> day of rehabilitation and then will be taken at 5<sup>th</sup> week and on 10<sup>th</sup> week.

### **Results:**

Rehabilitation for patients with acute ischemic stroke as early as possible helps in early recovery post-stroke. Basic bed mobility training improves mobility and joint integrity. Also the basic limb positioning and compression of joints will help **in joint position sense.**The techniques of Brunnstrom approach, Roods approach will provide the sensory stimulation and NDT will help in motor recovery of the patient. So, patient will show a good recovery if all the treatment protocol will follow properly and regularly. She is under regular follow-up and rehabilitation in our department.

### **DISCUSSION:**

It has been found that as early as possible we begin for hand rehabilitation physiotherapy the more hand functions will be achieved. As, in MCA stroke in majority of cases either hand function is not achieved throughout or if hand rehabilitation has started late again there will be less chances of achieving hand function. Early physiotherapy rehabilitation for left upper limb, left lower limb and hand will altogether help the patient to become independent for her ADL's.

The study done by Copenhagen(1995) found that almost 80% of patients who suffered from acute stroke was able to walk within 6 to 11 weeks with minimal assistance (5). Since, from

few years it is found that single or dual task training has also shown a great improvement in ADL of patients (6).

### **Conclusion-**

**Early hand** rehabilitation has been shown to be beneficial in improving a patient's condition, resulting in a favourable outcome, as well as raising the patient's confidence and mental health. These methods open up the possibility of starting rehabilitation from the ICU itself, resulting in better outcomes. The earlier the intervention is provided, the better the outcome.

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**Author's Contribution:** All authors contributed equally to the study.

**Informed consent:** A proper informed consent was taken from the patient prior

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