

# Imagine! Motor Imagery as an Adjunct to Conventional Neuro Rehabilitation after Stroke

DR AYESHA AHMAD, PT

*DPT (The University of Lahore), MPPTA, MSPTN\* (The University of Lahore)  
House#2 Block F Phase II Garden Town Gujranwala  
Email: ahmadayasha460@gmail.com, Mobile number: 03324212848*

Stroke occurs due to obstructed blood flow in the brain that eventually leads to cell death. More than 13.7 million episodes of stroke occur each year in the world. The three main types of stroke are Transient Ischemic Attack (TIA), ischemic stroke, and hemorrhagic stroke. In TIA the interruption is temporary and there are no permanent neurological deficits. Ischemic stroke is the commonest (about 87%) and occurs due to obstructed blood supply of the brain. Hemorrhagic stroke is caused by ruptured blood vessel. Stroke is broadly divided into total anterior circulation stroke (TACS), partial anterior circulation stroke (PACS), lacunar stroke (LACS) and posterior circulation stroke (POCS) with symptoms including hemiparesis, sensory changes, visuospatial problems, cognitive impairments etc. The deficits depend upon the area of brain affected. Motor impairment affects about 80% of patients<sup>1</sup>. Recovery from stroke requires physical therapy or rehabilitation<sup>2</sup>.

MI (Motor Imagery) is the mental rehearsal of a task without execution. There may or may not be kinaesthetic sensation. It includes complex cognitive functioning of the patient. MI stimulates the motor regions of the brain to facilitate movement and does not depend upon the residual motor functioning. It aids in developing an alternative pathway for the movement. MI is based on the mirror neurons. According to the mental simulation theory, according to another hypothesis the patient is able to foresee the outcome of an action through previous experience. Neural motor network is stimulated by imagining motor actions. The combination of motor imagery with the conventional therapy is more beneficial as compared to the use of conventional therapy alone. Some tools to assess the patient for MI include Kinaesthetic and Visual Imagery Questionnaire. Motor Imagery for rehabilitation in physical therapy

can be conducted as external (where the patient imagines from the view of an external observer) and internal or kinesthetic (where the patient imagines his own body movement)<sup>3</sup>.

A systematic review by Noelia et al (2019) concluded that MI can improve upper and lower limb functionality as an adjunct to other techniques after stroke<sup>4</sup>. A systematic review and meta-analysis conducted by Kruse et al (2020) showed that MI can improve brain function recovery and upper extremity functioning after stroke<sup>3</sup>.

It is the need of the hour that conventional Neuro rehabilitation in Pakistan is revolutionized by introduction of techniques from evidence to keep it from stagnancy and to provide standard and up to date rehabilitation for patients after stroke.

## REFERENCES

1. Whitehead S, Baalbergen E. Post-stroke rehabilitation. *South African Medical Journal*. 2019;109(2):81-3.
2. Boukhennoufa I, Zhai X, Utti V, Jackson J, McDonald-Maier KD. Wearable sensors and machine learning in post-stroke rehabilitation assessment: A systematic review. *Biomedical Signal Processing and Control*. 2022;71:103197.
3. Kruse A, Suica Z, Taeymans J, Schuster-Amft C. Effect of brain-computer interface training based on non-invasive electroencephalography using motor imagery on functional recovery after stroke—a systematic review and meta-analysis. *BMC neurology*. 2020;20(1):1-14.
4. López ND, Monge Pereira E, Centeno EJ, Miangolarra Page JC. Motor imagery as a complementary technique for functional recovery after stroke: a systematic review. *Topics in stroke rehabilitation*. 2019;26(8):576-87.