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A CLINICAL REVIEW ON MOTOR RELEARNING PROGRAMME AMONG STROKE SURVIVOR

Monika Swaroop[1],*Gowrishankar Potturi[2], Anjali Agarwal[3], Neha Dubey[4], K.B Ranjeet Singh Chaudhary[5]

[1.] MPT 1st year Department of Physiotherapy, faculty of Paramedical Sciences UPUMS, Saifai, Etawah (U.P)
[2]. HOD, Faculty, Department of Physiotherapy, faculty of Paramedical Sciences UPUMS, Saifai, Etawah (U.P)
[3.] Faculty, Department of Physiotherapy, faculty of Paramedical Sciences UPUMS, Saifai, Etawah (U.P)
[4.] Faculty, Department of Physiotherapy, faculty of Paramedical Sciences UPUMS, Saifai, Etawah (U.P)
[5]. Faculty, Department of Physiotherapy, faculty of Paramedical Sciences UPUMS, Saifai, Etawah (U.P)
Corresponding author- Gowrishankar Potturi
Address for Correspondence: Department of Physiotherapy, faculty of paramedical Science UPUMS, Saifai, Etawah (UP)
Email id- potturigowrishankar@gmail.com
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ABSTRACT:

Background and purpose-Stroke is a neurofunctional disorders of two types, one haemorrhagic and the other ischemic, both of which mainly involve motor and sensory dysfunction. The purpose of this review is to compare the effectiveness of motor retraining programme in stroke survivors to other conventional approaches (bobath, PNF, Mirror therapy, electrical stimulation) often used in stroke rehabilitation

METHODS AND MATERIAL –Studies were selected by using the key words Motor relearning program, stroke, and conventional physiotherapy. The search for the relevant journal was carried out referring through many different data bases such as: PubMed, PubMed Central, scientific reports and form other internet sources.

Keywords: stroke rehabilitation, MRP, conventional therapy

CONCLUSION - MRP and traditional rehabilitation approaches are both effective for functional outcomes in stroke rehabilitation, but some studies indicate that MRP is more effective in functional rehabilitation of stroke survivors than conventional therapy, so the physical therapist must include MRP in stroke rehabilitation to achieve functional results.

INTRODUCTION :

A stroke is a sudden loss of neurological function due to interruption of blood flow to the brain. There are two types of it. Ischemic stroke and haemorrhagic stroke occur when a blood clot blocks or reduces blood flow, or when a blood vessel bursts, causing blood to leak into or around the brain. Stroke is a common neurological problem, with approximately 800,000 cases reported each year in the United States alone1. The incidence of stroke is approximately 160 per 100,000, doubling every decade. Stroke is the most common cause of death and acquired disability in the world; its impact 5 and a half million people die from stroke every year and more than 116 million people lose their lives every year from stroke3. Every year, about 610,000 people have a first stroke and 18,500 have a repeat stroke. . Evidence suggests that the prevalence of stroke in India ranges between 105 and 152/100000 people per year2. Grounded on the Global Burden of Disease database between the years 1990 to 2019, the estimated number of deaths worldwide from Ischemic Stroke (IS) has increased from 2.04 million- nearly 3.29 million.3 Common symptoms of a stroke include sudden weakness and numbness in the face, arms or legs, especially on one side of the body; sudden confusion; difficulty speaking or understanding speech; sudden visual disturbances in one or both eyes; sudden dizziness; loss of balance and coordination; difficulty walking; and severe headache of unknown cause . Rehabilitation plays an important role in reducing disability and promoting independence. It also increases autonomy, reduces hospitalization and increases return home after surgery 6. The most commonly used approaches are Rood's sensorimotor approach, Brunstrom movement therapy, the neurodevelopmental method (bobath) and proprioceptive neuromuscular facilitation (PNF). In the 1980s, there was a new way to retrain stroke patients: motor retraining programs. Motor retraining is a task-oriented program designed to train or retrain stroke patients to improve motor control in performing ADLs. The main principle is to analyse the task, practice the missing components, practice the task and transfer what you have learned to daily activities. The MRP has seven parts, it includes

upper extremity function, oral-facial function, and sitting on the side of the bed, balanced sitting, standing and sitting, balanced standing and walking. In addition, mrp has four elements: elimination of unwanted motor activity, feedback, training and the relationship between postural control movements. MRP involves exercise of muscle activity, functional movement of the affected limb and suppression of compensatory activity on the affected or unaffected side.

Study objective:

To identify the benefits of MRP compared to conventional physical therapy in improving functional outcomes in post-stroke patients.

Materials and methods :

Clinical review finds differences in thematic analysis of web search. Databases such as PubMed, web of sciences, PubMed central, Google scholar search with the keywords of stroke, Motor relearning programme, conventional therapy.

Study selection

Studies included in our review, they were conclude on age group more than or equals to 45 years, the detailed inclusion and exclusion category describe in table 1.

	Inclusion	Exclusion
Study year	2000 to 2023	1999 and before
Study design	Rct, systematic review ,original article ,cross sectional study	Surveys ,coherent study ,manuscript, Rol, dissertation
Settings	Hospital ,opd ,ipd, rehabilitation centre	Community, camp ,Ngos
Context	Mrp, Pnf ,Bobath, functional approach	Orthopaedic approach, surgical approach
Outcome measures	Motor assessment scale ,wolf motor functional scale , fuel Meyer scale, dynamic gait index ,tug test ,berg balance scale,10 min walk test ,Fim scale, Barthel ,mini mental status scale ,index ,Sodring motor evaluation scale	Mas ,Mmt ,Vas scale, Nprs,

Data extraction and analysis :

4 reviewers independently performed data extraction and reviewed the resulting data for
The following study characteristics

1. Study Objectives
2. type of stroke (ischemic and haemorrhagic)
3. No. of subjects include
4. Research objective

5 Results :

The characteristics mentioned above are summarised in table 2

S.no.	Characteristics	Author	Country	NO. of subjects, involved	Type of research	Conclusion
1	Can physiotherapy after stroke based on the Bobath concept results in improved quality of movement compared to the motor relearning programme	Birgitta Langhammer& Johan K. Stanghelle (2011)	Europe	Total 61 patients Gr(a)mrp-33 Gr(b)bobath-28	Randomized controlled stratified trails	Through the task orientation Exercise of mrp leads to strengthen and improve the quality of movement in upper and lower limb function in stroke rehabilitation
2	Effect of mrp versus bobath approach on functional mobility in hemiplegic pt.	Satwinder singh,dr, lalit arora ,dr.reena arora (2022)	India	30 hemiplegic pt. Gr.(a)received mrp Gr.(b) bobath t/t for 6 days /weekfor 6 weeks	Randomized clinical trails	The group which received mrp are having more effectively improving functional mobility

						and reducing functional disability than the group that received bobath in hemiplegic pt.
3	Effect of mrp and conventional training on functional mobility in post stroke patient	Suraj B.kanase 2020	India	Total 30 subjects were taken gr(a)mrp Gr(b)conventional t/t taken for 4 times per week for 6week	Experimental study	This experimental study shows that mrp has attention control, memory enhancement, flexibility training, inhibitory control through the functional mobility enhanced thus it is more effective than conventional approaches.
4	The difference between mrp and bobath method on standing balance in stroke pt.	M.Hasinuddin (2020)	India	Total 24 pt. were taken ,the group divided on the basis of age group Mrp group contain pt. of 50-59 yrs. Bobath gr.pt are>60 yrs. t/t given for 40 min each ex for3 times in a week for a month	Quasi experimental study Pre and post test	This study shows that that the difference in the effectiveness of bobath and mrp while using stroke rehabilitation in standing balance and bobath is more effect than mrp in standing balance in stroke patients
5	The effect of mrp on balance ,mobility and performance of activity of daily living among stroke pt.	Amer ghrouz(2021)	Europe	Total 66 subjects were taken gr(a) receive task specific mrp Gr(b) t/t session per week 1 h per session for 8 weeks	Randomized control technique	This study shows that due to task oriented approach the MRP gives the better outcome in the stroke rehabilitation.
6	Principles into practice an observational study of physiotherapy use of motor learning principles in stroke rehabilitation	Louise Johnson et all (2022)	UK	89 therapy session were observed involving 55 clinicians and 57 patients	Observational cross sectional study	To optimise the potential for motor skill learning therapist must manipulate the feature of their coaching language and practice design, thus to implement motor learning principle more consistently to benefit motor skill for recovering in stroke pt.
7	Mrp versus Pnf for improving basic mobility in chronic stroke pt.	Ranjeet Singha (2017)	Abu Dhabi ,khalidia UAE	Total 30 subjects were taken Gr(a) mrp receiving Gr(b)Pnf receiving t/t for 30 mins 3 times per week for 3 weeks	Experimental study	The mrp drives the neuroplasticity its leads to better outcomes in improving the basic mobility of sit to stand ,stand to sit and walking around

						in their home setting thus subjects can maintain their basic mobility
8	A randomize control trail comparing the effects of mrp and mirror therapy for improving upper limb function in stroke pt.	Shafqatullah jan et all (2019)	Pakistan	Total 66 subjects , Gr(a) mrp receiving Gr(b)mirror therapy receiving t/t given for 6 weeks ,3 day per week ,2 hours per day	Randomised control trails	The mirror therapy enhances the functional activity of upper limb and the Mrp due to its task specific ex more enhances the functional activities in stroke pt.
9	Motor relearning program along with electrical stimulation for improving upper limb function in stroke pts.	Ikram ullah et all (2020)	Pakistan	Total 44 subjects MRP and electrical stimulation given for 5 days a week for six week Each session 45 min of mrp and 15 mins of electrical stimulation	Quasi experimental study	Mrp along with electrical stimulation both enhances the upper limb function in sub- acute stroke patients.
10	Comparative study on the effect of task oriented motor relearning program and thermal stimulation over upper limb motor function among stroke subjects	Jibi paul (2014)	Malaysia	Total 20 subjects Gr(a)10 subjects MRP is given Gr (b) 10 subjects thermal stimulation is given. All of the subjects taken having MCA stroke	RCT	The MRP gr is more effective to improve upper limb function in MCA stroke where as in thermal stimulation and MRP both shows significant functional improvement in MCA stroke patients.

DISCUSSION :

In this review article, a motor retraining program is a rehabilitation program that focuses primarily on human movement and motor skill. This program has seven parts that focus on important activities of daily living: upper extremity function, oral-facial function, lying down, standing and sitting, standing and walking. Mrp is intended to be sufficient to restore movement and motor control after a crash. The motor retraining program has four main stages: (a) performance analysis; b) exercise of the missing parts; c) implementation of the activity; (d) transfer of learning

. In this review article, we evaluate the use of motor retraining programs compared to traditional approaches after stroke in people aged 45-75 years and their effects on functional recovery and quality of life. Several articles reviewed for this article are listed below.

- Birgitta Langhammer, Jonathan K. Stanghelle (2010) Can Bobath-based physiotherapy after stroke improve movement quality compared to motor retraining programs. The study was conducted with a total of 61 patients. Two scales are used for evaluation: the Sodring motor rating scale and the motor rating scale. This study found that skill strength and movement quality improved more in a motor relearning program than in a task-based approach to acute stroke rehabilitation.
- Singh S., Arora L. and Arora R., Effect of a motor relearning program and the Bobath -approach on functional mobility in hemiplegic patients by: RCT (2022), A randomized control trial was conducted with a total of 30 hemiplegic patients. The MAS, BI and FIM scales were used to measure results, and the study results concluded that the effect of MRP is greater than the bobath approach in reducing functional disability and improving functional mobility in hemiplegic patients.
- S.B., Effects of Motor Retraining Programs and Traditional Exercises on Functional Mobility in Post-Stroke Patients (2020) After an experimental study, they concluded that there is specificity and variability in the practice of motor retraining programs and includes attention management making it more effective in improving functional mobility in stroke survivors compared to conventional rehabilitation.
- Mufidah, N., Wahyudi, R., Hasinuddin, Hasinuddin M. (2020) In a Quasi-Experimental Study on Differences in Motor Relearning They concluded that mrp- and bobath-the effectiveness of the methods show differences in standing balance between stroke survivors. In Bobath approach, the complex interactions between these sensory and musculoskeletal systems are then regulated in the brain, while in MRP, neuronal quality is improved, which in turn leads to an increase in the cognitive, associative and autonomic aspects of stand in in patients with stroke.

- Ghrouz A. Marco E Munoz- Redondo, et al (2020) Effect of a motor retraining program on balance, mobility and performance of daily activities in post-stroke patients. This is a randomized controlled trial, and outcome measures include the Berg Balance Scale, Timed Rise and Go Test, 10-meter Walk Test, and Barthel Index scales. After the study, they concluded that MRP has a task-specific training approach that allows stroke survivors to effectively and quickly return to their daily functional activities, which in turn leads to better outcomes in stroke rehabilitation.
- Johnson, L et al. . Putting all the principles into practice: an observational study of a physiotherapist's use of the motor learning principle in stroke rehabilitation. This is an observational study and after observation they conclude that motor skills during stroke rehabilitation are optimized tasks during rehabilitation. With subsequent learning, the Therapist manipulates the rehabilitation process, manipulates the characteristics of the rehabilitation language and the planning of the exercise. All this enables us to improve clinical practice, which in turn improves stroke rehabilitation using MRP principles.
- Singha, R. (2017). A motor retraining program versus the PNF technique to improve core mobility in chronic stroke patients. A comparative study. That study concluded that MRP is more effective than PNF in improving functional mobility because MRP has intense repetitive task-specific practice that drives neural plasticity such that MRP improves basic mobility in chronic stroke survivors.
- Jan Shafqatullah, Arsh. A., Darain, H. et al. (2019) A randomized controlled trial comparing the effects of a motor retraining program and mirror therapy on improving upper extremity motor function in stroke patients. This study concluded that both a motor retraining program and mirror therapy are effective in upper extremity treatment. Motor function, in stroke patients, but motor relearning is more effective due to task-oriented exercises.
- Ullah, Arsh. A., Zahir.A .A. et al., A Motor Retraining Program with Electrical Stimulation to Improve Upper Limb Function in Stroke Patients (2020), Quasi-Experimental Study. They concluded that the effect of electrical stimulation and retraining programs also improves the upper motor function of the subacute stroke stage among stroke survivors, because although it uses only electrical stimulation during stroke rehabilitation, it can improve motor impairments when only MRP is used with electrical stimulation significantly improves upper limb function in stroke patients due to its task-oriented approach
- Paul J., Comparative study of the effects of upper limb-specific motor retraining programs and thermal stimulation on upper limb motor function, stroke patients, subjects (2014) is an RCT study conducted with 20 participants. After the study, they concluded that both mrp and thermal stimulation significantly improve upper limb motor function in stroke patients, but mrp is more effective than thermal stimulation in restoring functionality.

CONCLUSIONS :

In this review article, we looked at the effects of motor retraining programs on functional improvement, quality of life and limb motor function in stroke survivors compared to another conventional approach, the Bobath approach. , electrical stimulation, thermal stimulation, proprioceptive neuromuscular facilitation and conventional approaches.

After reviewing several articles, we can conclude that the effect of a motor retraining program are more effective compared to other traditional approaches due to its task-oriented approach and repetition of task performance, whereby the effectiveness of MRP increases the functional recovery of stroke survivors. MRP includes functional activities because the exercise protocol is adapted to the motor deficit of the patient. In this approach, we first identify the function or task that the patient is unable to perform. The task is then broken down into small steps so that the patient can perform these steps repeatedly on the affected side. After that, the task becomes difficult and difficult to gradually increase the functional recovery of stroke survivors, so MRP is more effective than conventional treatment. We have also seen in some articles that MRP combined with some conventional approaches such as electrical stimulation and mirror therapy has accelerated functional rehabilitation in stroke survivors.

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