

Case Report

Effect of matrix rhythm therapy on muscle strength and motor nerve conduction velocity in patient with foot drop: a case report

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Received: 30 January 2025

Revised: 06 March 2025

Accepted: 11 March 2025

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ABSTRACT

Foot drop is a neurological symptom leading to the inability to lift the forefoot due to the weakness of the dorsiflexors of the foot. Physiotherapy treatment plays crucial role in the treatment of foot drop. Matrix rhythm therapy (MaRhyThe) is an advanced physiotherapy modality that activates and rebalances specific physiological vibrations of skeletal muscles and the nervous system. While MaRhyThe has demonstrated effectiveness in various musculoskeletal and neurological disorders, its impact on foot drop has not been previously studied. Therefore, this study aims to investigate the effect of MaRhyThe on muscle strength and motor nerve conduction velocity in foot drop patient. The patient received MaRhyThe, targeting the course of the sciatic nerve for 60 minutes once weekly over three consecutive sessions along with conventional physiotherapy. MRC grading for muscle strength, Stanmore assessment questionnaire for foot drop, and Nerve conduction velocity were outcome measures. The patient showed improvement in active dorsiflexion and muscle strength of tibialis anterior and extensor hallucis longus. The findings suggest that MaRhyThe in combination with conventional physiotherapy showed promising results in the treatment of foot drop. Further research is needed to validate the findings of this case report, including clinical and controlled trials.

Keywords: Matrix rhythm therapy, Foot drop, Muscle strength, Motor nerve conduction velocity

INTRODUCTION

Foot drop is characterized by weakness in the dorsiflexion of the ankle and toe. It leads to weakness in the dorsiflexors which may lead to gait impairment in which the patient walks dragging their forefoot on the ground and exhibits high stepping gait.¹ Based on the level of muscle weakness and muscle paralysis, a foot drop can be temporary or permanent and this can involve either one or both feet.² Common causes of foot drop are peroneal neuropathy, sciatic nerve injury, disc herniation, spinal canal stenosis, TB spine, trauma, space occupying lesion at L4-L5 level.³ Physiotherapy treatment for foot drop includes neuromuscular electrical stimulation, functional electrical stimulation, strengthening exercises of paralyzed muscles, and static and dynamic ankle foot orthosis as per patient's requirement and muscle strength is used to limit

plantar flexion and to assist dorsiflexion of the affected foot.⁴

MaRhyThe is an advanced physiotherapy modality that activates and rebalances specific physiological vibrations of skeletal muscles and the nervous system. It was developed by Dr. Ulrich Randall who states that human cells rhythmically pulsate in frequency of 8-12 Hz to maintain the physiological functions of the body.⁵ Any disturbance in health can affect cell frequency due to changes in circulation at the cellular level. This affected frequency can be brought back to normal by applying MaRhyThe. It creates an asymmetrical pressure distribution in tissues and also stimulates nerve receptors.⁶ MaRhyThe has proven to be effective in various musculoskeletal conditions such as musculoskeletal pain, osteoarthritis, myofascial trigger points, frozen shoulder etc. and a few neurological conditions such as spastic

cerebral palsy, trigeminal neuralgia, and diabetic neuropathy.⁷⁻¹² But to our knowledge, the effect of MaRhyThe has not been studied in foot drop cases. Therefore, this study aims to investigate the effects of MaRhyThe on muscle strength and motor nerve conduction velocity in foot drop patient.

CASE REPORT

A 45-year-old male patient visited the neuromedicine department with complaints of weakness in his right leg. He experienced the inability to hold the footwear in right foot and difficulty in walking since 2 months. The patient did not experience any pain or sensory loss in the affected leg. There was no history of fall or injury of any other kind. On 20th November 2024, he was admitted to a tertiary care hospital in Belagavi for further investigation and treatment for the same.

On admission to the tertiary care hospital, the patient underwent various investigations viz an MRI of the entire spine and nerve conduction study on 21st November 2024. The report for the MRI scan suggested postero-central disc protrusion at L4-L5 and L5-S1 causing compression on subarachnoid space and traversing nerves. The NCV report suggested axonal motor neuropathy of the right common peroneal nerve.

His routine blood investigations including CBC, mini-renal, LFT, sugar, and thyroid profile were within normal ranges and HBsAg, HCV and HIV were non-reactive. The patient was treated conservatively by tab. Pregabalin 75 mg BD, tab. Neurokind 1500 µg BD, tab. Shelcal 500 mg OD for 1 month. Looking at his current clinical condition, the patient was referred for physiotherapy rehabilitation for further management

Clinical findings

Prior to the commencement of physiotherapy treatment, a detailed clinical assessment was conducted following written informed consent. The clinical examination revealed paralysis of the tibialis anterior, extensor hallucis longus and extensor digitorum brevis along with diminished knee jerk and absent ankle jerk in right foot. All the sensations of the affected extremity were intact. Muscle strength of dorsi flexors was grade 0 of MRC grading. The scores of Stanmore assessment questionnaire for foot drop were 36.

Procedure

The patient was informed about the treatment procedure, along with the associated risks and benefits. Counseling was provided regarding the importance of adhering to the treatment plan, and every precaution was taken to prevent complications such as pain and discomfort. A pre-treatment baseline assessment was conducted, which included the patient's age, height, weight, and BMI. Outcome measures were recorded pre- and post-treatment, using the Stanmore assessment questionnaire of foot drop, and manual muscle testing (MMT) and nerve conduction velocity. The patient then received MaRhyThe at an intensity set to the 10 O'clock position, targeting the entire course of the sciatic nerve for 60 minutes once weekly over three consecutive sessions. Conventional treatment included electrical stimulation of the tibialis anterior, extensor hallucis longus and peroneal group of muscles with faradic current, 3 sets 30 contractions given once a day, and tone-inducing techniques including quick stretch, quick icing, fast tapping and stroking over the affected muscles. Patient was also advised to wear posterior leaf ankle foot orthosis during the course of treatment.

Table 1: Follow up and outcome measures.

S. no.	Assessment tool	Pre-treatment	Post-treatment
1.	Manual muscle testing (MRC grading)		
	Tibialis anterior	Grade 0	Grade 3
	Extensor hallucis longus	Grade 0	Grade 3
2.	Stanmore assessment questionnaire for foot drop	36 (poor)	75 (good)
3.	Motor nerve conduction velocity (Amplitude in mV)		
	Right tibialis anterior		
	Popliteal fossa-TA	0.74	1.98
	Popliteal fossa-fibula	0.71	1.93
	Right extensor digitorum Brevis		
	Ankle-EDB	0.16	1.56
	Fibula-ankle	0.17	1.92
	Popliteal fossa-fibula	0.14	1.87

DISCUSSION

The case mentioned above is of a 45-year-old male diagnosed with sudden onset of right foot drop. For this patient, Matrix rhythm therapy was incorporated into the

treatment protocol along with conventional treatment. Different outcome measures such as MRC grading for muscle strength, Stanmore assessment for foot drop and Nerve conduction velocity of common peroneal nerve were used before and after the patient was given MaRhyThe.

The findings of this report showed promising improvements in various aspects like strength, ankle range of motion, and conduction velocity of the common peroneal nerve of the foot after the application of MRT along with conventional physiotherapy. This result is consistent with the previous studies conducted on the effect of MRT on neurological conditions which includes a study done by Unal et al who investigated the effect of MaRhyThe on muscle tone, balance, and gait in stroke survivors, demonstrating that 60 minutes of MaRhyThe applied to affected muscles, three times per week for four weeks, significantly improved muscle tone and improved gait parameters.¹³ Waris et al also utilized MaRhyThe alongside conventional therapy for a C5-C6 quadriplegic patient, concluding that the treatment effectively activated muscles and stimulated sympathetic and parasympathetic pathways.¹⁴ MaRhyThe® restores the extracellular matrix to normal, allowing both cellular and extracellular functions that have been disturbed to start again, resulting in self-organization and self-healing. The muscle strength of foot drop patient improved after MaRhyThe® as it accelerates structural and functional nerve regeneration and relaxes muscle fibers

Although this report suggests the positive effect of MRT on foot drop, there remains a lack of understanding regarding the mechanism and effectiveness of MaRhyThe, particularly on neurological conditions, which emphasizes the need for interventional studies to optimize its therapeutic potential.

CONCLUSION

The current study concluded that the MaRhyThe given in combination with conventional physiotherapy showed promising results in improving the active dorsiflexion and muscle strength of tibialis anterior and extensor hallucis longus in patient with foot drop by enhancing motor nerve conduction values of common peroneal nerve.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Dharwadkar RV, Chilka RS, Deole MS. Effect of matrix rhythm therapy on muscle strength and motor nerve conduction velocity in patient with foot drop: a case report. *Int J Res Med Sci* 2025;13:1711-3.