



ORIGINAL RESEARCH PAPER

Physiotherapy & Rehabilitation

COMBINED EFFECTS OF TREADMILL WALKING AND ELECTRICAL STIMULATION ON FOOT DROP PATIENT - CASE STUDY.

KEY WORDS: Electrical stimulation, walking ,foot drop.

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ABSTRACT

Introduction: Foot drop is a gait disorder that drops the foot forward due to weakness, irritation, or damage to peroneal nerve, and paralysis of the muscles in back of the foot. It is characterized by inability or impairment to raise the toes or lift the foot from ankle. **Case Presentation:** A 38 - year old man was visited one place, for this he travel 8 hours constant sitting one position in his car. After came home, he feel difficulty in walking, he was not lifted ankle after he rushed to hospital. After all investigation doctor told that he had left leg foot drop. Neurologist suggested physiotherapy. **Management and Outcome:** Electrical stimulation setting with walking on treadmill with specific speed and time. Manual Muscle Test(MMT), and Foot and Ankle Disability Index(FADI). **Discussion:** Electrical stimulate activating the motor unit direct depolarization of muscle can used to stimulate the general peroneal nerve, activating the dorsiflexors muscles of the foot during the swing phase of gait. **Conclusion:** The treatment of electrical stimulation with walking on treadmill is to be useful for patients with foot drop.

INTRODUCTION:

Foot drop, in which the ankle is not properly flexed and may drag on the ground during the swing phase of gait cycle, commonly occurs after stroke, spinal cord injury, or other disorders of the central nervous system.

Various devices are used to treat this condition including AFO, exercises, functional electrical stimulation, and also electrical stimulation.

AFO can prevent the foot from dragging on the ground, they can be comfortable to wear and do not prevent disuse atrophy of ankle flexors muscle. Exercise can gave results take longer time to recoverd. Functional electrical stimulation was most effective treatment for foot drop. It gave results take shorter time to recovered, but it was high- cost treatment. So electrical stimulation with treadmill walking is the solution for effective treatment in affordable cost.

Electrical stimulation was able to increase muscle strength, cause the depolarization of axons by an electric field. Depolarization of muscle can used to stimulate the general peroneal nerve, activated the dorsiflexor muscles of the foot during the swing phase. (1)

Case Presentation:

A 38 - year old man was visited one place, for this he travel 8 hours constant sitting one position in his car. After came home, he feel difficulty in walking, he was not lifted ankle after he rushed to hospital. After all investigation doctor told that he had left leg foot drop. Neurologist suggested physiotherapy. The physical examination performed when the patient came, the walking phase was lost, as stance and swing phase. The ranges of motion of ankle joint actively could not be performed especially for dorsiflexion. Main muscle of dorsiflexor tibialis anterior was manual muscle test(MMT) 0(zero). Supporting dorsiflexor and eversors was peroneus longus and peroneus brevis was MMT also 0 (zero).

The examination of functional activity ability used the foot and ankle disability index(FADI) with 26 items and a 104 of total points. The FADI is designed to assess functional limitations related to foot and ankle conditions. In FADI two components of activity daily living and pain. (2)Patient FADI score was 66 out of 104 of total points at first time evaluation as outcome measurements.

Management And Outcome:

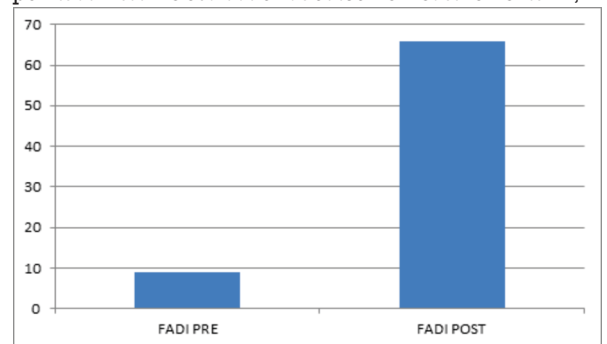
Starting three days of management was put galvanic current on all dorsiflexors motor points for 15 minutes on each points.

facilitation exercise, stretching exercise also started with this electrical stimulation. After three days started electrical stimulation on surge faradic current mode with treadmill walking .

In Electrical stimulation mode was surge faradic current with frequency of 40 hz, intensity 20- 80 mA ,time 20 mins with 1:3 ratio of rest period during walking.

Set stimulation rest and continuous mode according to onset of swing phase. Active electrode placement was lateral surface of tibia to one third of proximal part, and Reference electrode placement follow the muscle belly active electrode down and two-third of the way down the shin with facing the midline of the body. In Treadmill , walking speed was 0.5kph,time was 20 min. coordinated stimulation with time and speed .Regular foot drop exercises also done after this walking.

After 20 days of this experimental study, The ranges of motion of ankle joint actively performed especially for dorsiflexion. Main muscle of dorsiflexor tibialis anterior was manual muscle test(MMT) 3(three). Supporting dorsiflexor and eversors was peroneus longus and peroneus brevis was MMT also 3 (three). Patient FADI score was 9(nine) out of 104 of total points at first time evaluation as outcome measurements. In ,



Graph-1 FADI score difference was noted.

This graph shows that marked disability index was decreased, muscle power also improved and patient started active lifestyle in 20 days.

CONCLUSION:

The treatment of electrical stimulation with walking on treadmill is to be useful for patients with foot drop. In small setup with affordable range this treatment protocol is very

useful in foot drop patients. Fast recovery possible in this protocol. In future study, use this protocol in stroke patient .

Conflict Of Interest: No conflict of interest.

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