



“A COMPARATIVE STUDY BETWEEN MOTOR POINT STIMULATION VERSUS GROUP STIMULATION METHOD FOR WRIST DROP.”

Physiotherapy

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ABSTRACT

Wrist drop is mainly seen when the radial nerve injured. The overuse of arm and neurological condition that damage radial nerve this further lead to pain, numbness, tingling and weakness in wrist and digits. The study aimed to find the motor point stimulation and group stimulation method to reduce pain, improving the strength and increase the range of motion for wrist to determine the better result for participants. So, a Comparative study was conducted with 30 participants of Wrist Drop. They were studied for a 6-weeks intervention. They were divided into 2 groups by convenience sampling: - Group A: Individual Muscles Motor point stimulation method and Group B: Group stimulation method common for both group Passive movement, Counselling, Reassurance, Cock up splint. Pre- and post-treatment data were collected and analysed using SPSS 22.0. Paired and unpaired t-test was used to find out the significance of the treatment. A significant improvement in pain, disability, muscle strength ($p < 0.05$) after the treatment was found in both groups. Greater statistically significant improvement was seen in Group B as compared to Group A. Thus, the study concluded that Group stimulation method was more effective than individual muscles stimulation in Wrist Drop.

KEYWORDS

Wrist drop, Motor point stimulation, Group method stimulation, Passive movement, Cock up splint.

1. INTRODUCTION

The radial nerve is responsible for innervating the extensor muscles of the wrist and digits. The radial nerve arises from C5 to C8 and provides a motor function to the extensors of the forearm, wrist, fingers, and thumb. The superficial radial nerve provides a sensory function to the posterior forearm. Depending on the location of entrapment, a patient may experience pain, numbness, weakness, overall dysfunction, or any combination of these.^[1-3]

Faradic is an interrupted direct current that has a frequency of 50:100Hz with pulse duration from 0.1-1MS. This frequency and duration cause contraction and relaxation in innervated (nerves intact) muscles. It does not work on muscles that are denervated muscle; to cause the same effect a short pulse duration would be required.^[4]

Galvanic current is interrupted direct current has frequency 30 Hz with pulse duration 1Ms and more. This type of current is used for muscle that does not have the nerve because of injury of the nerve. When applying galvanic, the denervated muscle responds to this stimulus because of the long pulse duration.^[4]

Stimulation of the radial nerve produces an extensor movement of the wrist. Electrical stimulation at the wrist in applications can result in increased grip, strength, and improved motor function.^[5]

Passive movement therapy is widely used in physiotherapy and occupational therapy to prevent these complications in patients who are unable, to perform active movements.^[6-7]

A wrist splint decreases recovery time by immobilizing, stabilizing, and protecting a healing injury.^[8]

2. AIM

The aim of the study is to find a comparative study between motor point stimulation versus group/stabile stimulation method for wrist drop participants common with physiotherapy management.

OBJECTIVES

a) To find out the comparative study between motor point stimulation versus group/stabile stimulation method for wrist drop participants common with physiotherapy management treatment program improves range of motion.

b) To find out the comparative study between motor point stimulation versus group/stabile stimulation method for wrist drop participants common with physiotherapy management treatment program improves muscle strength.

3. Hypothesis:

Null Hypothesis

There is no significant effect of the motor point stimulation method

treatment program in increasing the strength of wrist extensors & improving grasping, gripping, and holding the object.

There is no significant effect of stable/group method treatment program in increasing the strength of wrist extensors & improving grasping, gripping, and holding the object.

There is no significant difference between the stable /group method and the motor point stimulation method treatment program in increasing the strength of wrist extensors & improving grasping, gripping, and holding the object.

Alternative Hypothesis

There is a significant effect of the motor point stimulation method treatment program in increasing the strength of wrist extensors & improving grasping, gripping and holding the object.

There is a significant effect of the stable/group method treatment program in increasing the strength of wrist extensors & improving grasping, gripping, and holding the object.

There is a significant difference between the stable /group method and motor point stimulation method treatment program in increasing the strength of wrist extensors & improving grasping, gripping, and holding the object.

4. METHODOLOGY:

4.1 METHOD

Study Design: Comparative study

Study Technique: Convenience Sampling

Study Setting: Nootan College of Physiotherapy, Neurology Physiotherapy Department Visnagar, Gujrat.

Intervention Duration: 6 Weeks

4.2 Selection Criteria:

Inclusion Criteria:

Gender both male and female.

Participant with pain at wrist joint.

Wrist drop caused due to any trauma.

Exclusion Criteria:

Participant with hand injury.

Participant with brain or spinal cord injury.

4.3 Procedures of Data Collection:

The participants experienced a detailed pre-evaluation. The pre-evaluation included an assessment which obtained information about demographic details, medical history, personal history, pain assessment of the participants using Mayo Wrist Score outcome measure. The participants were then divided into two groups i.e. Group

A and Group B. Group A received Motor Point Stimulation and Group B received Group Stimulation Method, keeping Physiotherapy management common for both. Treatment lasted for 6 weeks, having 4 sessions/week.

5.treatment Protocol

Group A: Motor Point Stimulation Method

1. Wrist and finger extensors (Extensor Carpi radialis longus and brevis, Extensors Carpi ulnaris) were stimulated with a pair of electrodes.
2. One electrode is placed proximally over the forearm below the elbow, and the other electrode is laced over the individual muscles.
3. Electrical stimulation has a pulse width of 300 ms and frequency of 20Hz with the amplitude set at a minimum level required to produce full joint extension.

Group B: Stable/group Stimulation Method

1. Patient sitting with arm support
2. One electrode was placed proximally over the forearm below the elbow, and the other was placed distally on the forearm.
3. Frequency: 30 – 35 Hz
4. Pulse duration : 250 – 350 μ s

Common For Both Group COUNSELING

1. Counseling is a form of talk therapy.
2. It is a process where an individual, family meet with a trained professional counselor to talk about issues and problems that they are facing in their lives.

Cock Up Splint

Wearing a cock-up during activity time reduces the pain, functional activity, support the wrist.

Reassurance

A physiotherapist works with patients to help them manage pain, motor function, gripping, and grasping the object.

Passive Movement

Wrist Flexion: - Move your hand towards the ceiling.

Wrist Extension: - Move your hand towards the floor.

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Motor point stimulation (Each muscle)	Motor point stimulation (Each muscle)	Motor point stimulation (Each muscle)	Motor point stimulation (Each muscle)	Motor point stimulation (Each muscle)	Motor point stimulation (Each muscle)
15 contraction	15 Contraction	15 Contraction	15 contraction	15 contraction	15 contraction
2 sets	2 sets	2 sets	2 sets	2 sets	2 sets
Passive movement	Passive movement	Passive movement	Passive movement	Passive movement	Passive movement
5 repetition/2 sets	5 repetition/2 sets	5 repetition/2 sets	5 repetition/2 sets	5 repetition/2 sets	5 repetition/2 sets

(Table 5.5.1 : 6 WEEKS OF MOTOR POINT STIMULATION METHOD WITH PHYSIOTHERAPY MANAGEMENT)

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Stable Group Stimulation method	Stable Group Stimulation method	Stable Group Stimulation method	Stable Group Stimulation method	Stable Group Stimulation method	Stable Group Stimulation method
30 contraction	30 contractions	30 contractions	15 contraction	15 contraction	15 contraction
6 sets	6 sets	5 sets	5 sets	4 sets	4 sets
Passive movement	Passive movement	Passive movement	Passive movement	Passive movement	Passive movement
15 repetition/3 sets	15 repetition/3 sets	15 repetition/3 sets	15 repetition/3 sets	15 repetition/3 sets	15 repetition/3 sets

(Table 5.5.2 : 6 WEEKS OF GROUP STIMULATION METHOD WITH PHYSIOTHERAPY MANAGEMENT)

6.RESULT

Outcome	Pre-Treatment Mean± SD	Post-Treatment mean ±SD	t value	p-value	Pre-Treatment Mean SD	Post-Treatment Mean SD	t value	p-value
Mayo Wrist Score	50.66±8.20	55.66±7.76	-10.247	0.000	49.00 ±9.67	69.00 ±8.28	-20.494	0.00

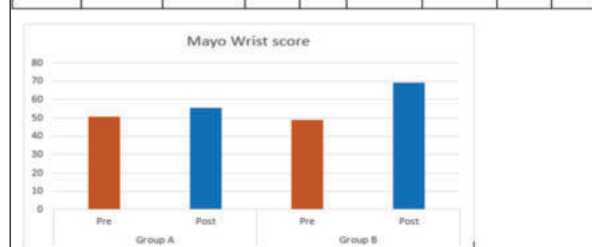


Table and Graph shows the comparison of the Mayo Wrist Score after 6 weeks. Statistically significant difference ($p < 0.05$) in pain level was found in participants after 6 weeks.

The results found in this study disclosed that after a 6 weeks treatment program, both groups, received attained a significant improvement in the strength extensors muscles of wrist and reduced pain and disability, but statistically greater significant improvement was seen in Group B as compared to Group A (p -value < 0.05).

All statistical analysis was done using SPSS 22.0 software for windows. Descriptive analysis was obtained by mean & standard deviation. Intragroup comparison of pre & post-treatment for Mayo Wrist Score was done using paired t-test.

7. DISCUSSION

The results found in this study disclosed that after a six-week treatment program, both groups, Group A, who received Motor Point Stimulation With Passive Movement Cock Up Splint, Re- Assurance And Counselling, and Group B who received Group /Stable Stimulation Method With Passive Movement Cock Up Splint, Re- Assurance And Counselling attained a significant improvement in the Range Of Motion and Strength of Extensors Muscles And improving grasping and gripping objects.

The main purpose of the study is to reduce pain, improve disability, improve muscle strength of the improve range of motion.

Wrist drop condition mainly caused by radial nerve palsy, because radial nerve innervations of extensors muscle of the wrist. The participants with wrist drop typically not able to extend the wrist movement, reduced muscle strength, not able to grasp and grip. Wrist drop is most commonly seen in work accidents, humerus fracture, nerve injury movement is affected for wrist and finger grasping, and gripping movement is also affected.

Electrical stimulation may have a direct effect leading to increased muscle strength and improved motor control, resulting in reduced wrist drop disability.^[9]

Joanna Powell et al found that ES enhanced the recovery of isometric wrist extensor strength, as shown by a greater increase in the moment at the wrist (at an angle of 0°) at the end of the treatment phase compared with the increase in given the group method electrical stimulation group.^[10]

This study was conducted on 30 participants with a mean age of (47.63 ± 7.665) mean $\pm$ SD. The participants were divided into two groups; Group A received Motor Point Stimulation Method and Group B received Group Stimulation Method for 1 session/day and 5 days/week for 6 weeks. In this study Mayo Wrist Score were used as outcome measures. The results showed a significant improvement in the outcome measures in the post-treatment stage as compared to the pre-treatment stage.

Thus, the alternative hypothesis [H11], [H12], [H13] is failed to reject. Though a significant improvement was found after treatment in both groups, Group B showed greater improvement in the Mayo Wrist Score. (p -value < 0.05).

Limitations of the study:

Small sample size
Samples were selected from visnagar

Future recommendations of the study:

Carry out the study with a large sample size.

8.CONCLUSION

The study concluded that the treatment protocol reached by, Group B Group /Stable stimulation Method with Passive Movement Cock Up Splint Reassurance and Counselling is more effective in reducing pain, disability, compare to Group A Motor Point Stimulation With Passive Movement Cock Up Splint Reassurance And Counselling.

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