

Effect of Occupational Therapy Intervention to Improve Functional Mobility in A Patient with C4 -C5 Spinal Cord Injury - A Single Case Study

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ABSTRACT

A spinal cord injury is a catastrophic and life-changing event that is defined as an injury to the spinal cord or spinal nerve roots that results in temporary or permanent change in an individual's motor, sensory, and/or autonomic function. The purpose of this study is to determine the effect of the Occupational therapy intervention to improve functional mobility in a patient with c4-c5 spinal cord injury . This is a single case study of an adult male with C4-C5 SCI. The therapy given for 25 days, 45 minutes/per day. Lower Extremity Functional Scale (LEFC) was used to test the functional mobility of the patient. Hence, this study concluded that the occupational therapy intervention was effective in improving functional mobility in SCI patients.

INTRODUCTION

In India, approximately 1.5 million people live with SCI. Majority of them are males in the age group of 16-30 years, signifying higher incidence in young.

SCI patients with injury at cervical level can't perform even simple activities such as self eating, dressing and grooming etc. because of impaired upper limb motor functions. That's the reason these patients remain bed bounded and remain dependent for the rest of their life. OT assists these patients in returning to a productive and fulfilling life by enabling them to perform their self-care activities. With the help of adaptive or supportive equipments and through regular upper limb activities, Occupational therapist train cervical SCI patients to perform their ADLs independently. Besides optimization of functional independence, OT training also helps in improving community integration and prevention of secondary complications.

Aim:

To determine the effect of occupational therapy intervention to improve functional mobility in a patient with c4-c5 spinal cord injury .

Objective:

To determine the level of spinal cord injury in a patient using the ASIA Scale .

To determine the level of muscle power by using Manual Muscle Testing .

To find out the functional mobility of the patient by using Lower Extremity Functional Scale (LEFC) .

To find out the effect of occupational therapy intervention to improve functional mobility in a patient with c4-c5 spinal cord injury .

DESIGN:

Single case study .

DURATION:

25 Days 45mins / day .

Source Of Data:

Patient from Saveetha Medical College.

CASE DESCRIPTION

The patient was 55 years male diagnosed with spinal cord injury due to fall , after 4 months laminectomy was done . The patient was referred from the Neurorehabilitation to the occupational therapy department for treatment.The patient was dependent in performing functional mobility thereby had a difficulty in Activities Of Daily Living .

Examination:

Sensory examination : Intact .

Motor examination : ROM was measured using Goniometer . Active Range Of Motion of the patient are as follow

HIP	RIGHT	LEFT
Flexion	0-90°	0-55°
Extension	0-20°	0-10°
Abduction	0-30°	0-20°
Adduction	30°-0	20°-0
Internal rotation	0-30°	0-20°
External rotation	0-30°	0-20°
KNEE	RIGHT	LEFT
Flexion	0-100°	0-70°
Extension	100°-0	70°-0
ANKLE	RIGHT	LEFT
Plantar flexion	0-30°	0-25°
Dorsi flexion	0-15°	0-10°
Inversion	0-30°	0-20°
Eversion	0-15°	0-10°

Muscle Strength: Muscle strength was performed using Manual Muscle Testing .

HIP	RIGHT	LEFT
Flexors	3-	3-
Extensors	3-	3-
Abductors	3-	3-
Adductors	3-	3-
KNEE	RIGHT	LEFT
Flexors	3-	3-
Extensors	3-	3-
ANKLE	RIGHT	LEFT
Dorsiflexors	3-	3-
Plantarflexors	3-	3-

According to ASIA Scale , the patient had GRADE C - Incomplete ; Motor function is preserved , below the neurological level , and more than half of the key muscles below the neurological level have a muscle grade less than 3 .

Functional Mobility:

Lower Extremity Functional Scale (LEFS):

The Lower Extremity Functional Scale (LEFS) is a questionnaire containing 20 questions about a person’s ability to perform everyday tasks. The LEFS used to assess functional mobility .The interpretation of the LEFS Scale are as follow :

The lower the score the greater the disability
 $\% \text{ of maximal function} = (\text{LEFS score}) / 80 * 100$

ACTIVITIES	PRE-TEST	POST-TEST
1. Any of your usual work,		

housework or school activities.	1	3
2. Your usual hobbies, recreational or sporting activities.	1	2
3. Getting into or out of the bath.	1	2
4. Walking between rooms.	2	3
5. Putting on your shoes or socks.	3	4
6. Squatting.	1	2
7. Lifting an object, like a bag of groceries from the floor.	2	3
8. Performing light activities around your home.	2	3
9. Performing heavy activities around your home.	0	1
10. Getting into or out of a car.	1	2
11. Walking 2 blocks. 1	3	
12. Walking a mile.	0	2
13. Going up or down 10 stairs (about 1 flight of stairs).	0	2
14. Standing for 1 hour.	1	2
15. Sitting for 1 hour.	3	4
16. Running on even ground.	0	0
17. Running on uneven ground.	0	0
18. Making sharp turns while running fast.	0	0
19. Hopping.	1	2
20. Rolling over in bed.	4	4
Column Totals:	24	44
% of maximal function	30	55

Goals:

The short - term goal is to improve the ROM and Muscle Strength . The long - term goal is to improve the Functional Mobility thereby improving the post -test scoring of LEFS Scale and also to improve Stair climbing , squatting, cross leg sitting in the floor .

Intervention

The patient attended occupational therapy treatment for 25 days 6 sessions per week. The intervention plan includes:

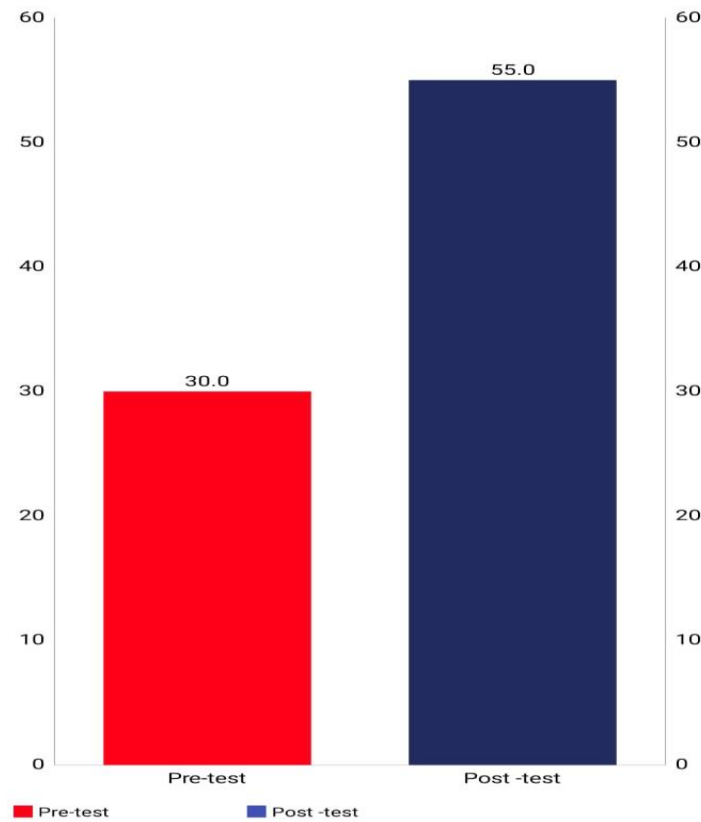
- *Active ROM activities of the lower limb.
- *Strengthening activities for both upper and lower limbs.
 1. Pelvic bridges
 2. Side plank
 - 3 . Squating with support
 4. Hip flexor strengthening - ball reaching with weighted cuffs

- 5. Obstacle crossing
- 6. Quadriceps

- *Step down practice
- *Stair climbing with support practice
- *Single leg standing
- *Focusing on ADL
- *Gait training



Table 1: Pre-Test Vs Post-Test



DISCUSSION / CONCLUSION

The purpose of the study was to examine the impact of the occupational therapy Intervention plan for a client with C4 – C5 spinal cord injury referred for motor regaining programs. The therapeutic interventions which are used for the patient mainly focus on the improvement of functional mobility. The patient receives the intervention On the regular basis of six sessions per week and which likely shows a significant improvement in functional mobility.

Although many studies there conducted on spinal cord injury patients to improve their functional mobility through occupational therapy there are no such studies were conducted for specific functional mobility training. Hence this study was conducted to find the effectiveness of occupational therapy in improving the functional mobility of SCI patients.

The patient received functional mobility training for one month the patient was an active participant and cooperative throughout the treatment. And thus it helped to contact the study in a significant manner thus this study proves that the occupational therapy intervention was effective in improving the functional mobility of Spinal cord injury patients.

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