Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL 14, ISSUE 8, 2023

Efficacy of Rehabilitation of patient with Cerebrovascular Accident: A Case Study.

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Abstract

An 53 yrs old female has suddenly developed neurological symptoms like hemiparesis so that the present study focuses on physiotherapy management in the form of neurological rehabilitation with assessment. Physical therapy and exercises is central part of rehabilitation programme which involves specific, individualized treatment that helps in improving functional movement. This active rehabilitation emphasis on functional independence like self-care and transfers mainly and later emphasis with coordination and balance. The outcome is measured by Functional Independence Measure score on before and after rehabilitation. This early rehabilitation provides a vital role in improvement of patient functional independence and quality of life of those affected with acute stroke.

Keywords: Cerebrovascular accident, Functional Independence Measure, Proprioceptive Neuromuscular Facilitation, Range of Motion, Strengthening exercises.

Introduction :

CVA is the most serious neurological disorders, in which ischemic stroke makes up approximately 85% and causes second reason for death in the world. The estimated prevalence of stroke rate range from 84-262/100,000 in rural and 334-424/100,000 in urban areas per year. There are 17 million new cases of stroke diagnosed every year and it is expected to be increased in upcoming years[1].

After stroke, mostly the patient presented with one side neuromuscular weakness, altered sensation, decreased speech ability, decreased postural control along with balance and coordination issues, fatigue, decreased ambulation, cognitive changes etc.,. They often experiences with physical, cognitive, social and emotional weakness and therefore, rehabilitation plays an important role in functional improvement of the patient[2].

Rehabilitation is defined by World Health Organisation (WHO) as a progressive, dynamic, goal- oriented and often time-limited process, which enables an individual with impairment to identify and reach the optimal mental, physical, cognitive and social function levels[3]. It reduces the permanent disability with restoring the life and working capacity. It continues with planning until discharge and integrated for family and peer to motivate the patient to continue the exercises at home[4,5].

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Physiotherapist is a part of multidisciplinary or interdisciplinary team necessary to handle rehabilitation process with specific and individualized treatment to improve functional movement. The aim of my study to find out the effectiveness of early rehabilitation of physiotherapy intervention for patient affected with ischemic stroke after aortic valve replacement surgery.

In early rehabilitation, the initial treatment starts with passive movements and stretching to the affected side to normalize the muscle tone and prevent the ignorance of other half side of body. There is more concentration of chest physiotherapy with breathing exercises to prevent the chest complications and improve the respiratory and circulatory functions. This followed by active training programme for the purpose of improving bed mobility, motor function, muscle strengthening of extremities, trunk and also respiratory muscles, coordination, balance and functional independence[6].

The rehabilitation emphasis mainly on the functional independence, includes bed mobility, transfers, wheelchair mobility skills , gait and balancing training(7). For progress of the patient, rehabilitation training with intervention like incentive spirometry, huffing and coughing techniques, Proprioceptive Neuromuscular Facilitation, Constraint Induced Movement Therapy are used and there is current recommendations like Biofeedback, Functional Electrical Stimulation, repetitive task training, water based exercises, Vitrual Reality, aerobic exercises, Physical fitness training or whole body vibration etc[8,9,10,11].

Case description

An 53 yrs old female present with weakness of right side of the body includes face, upper and lower extremity and dysarthria with right side mouth deviation and drooling of saliva. There is complete loss of movements and muscle power in right affected side and difficulty in standing, walking and all activities of daily living with loss of balance and co-ordination. MRI findings were consistent with acute left Middle Cerebral Artery small vessel ischemic infarct that this patient presented with right side Hemiparesis.

Past Medical History: K/C/O Diabetes mellitus.

Surgical History: Angioplasty done before one year.

Vital signs: All vitals are normal.

Objective Assessment:

On Observation:

Attitude of limb: Right upper and lower extremity in extended position.

Body built: Mesomorphic.

Posture: Right shoulder depressed but it got normal on 6th day.

Gait: Not able to assess initially and normal walking on 6th day.

Breathing pattern: There is normal thoraco-abdominal breathing with inspiratory and expiratory ratio of 1:2.

Odema: Presence of non-pitting odema over right foot, reduced in five days.

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On Palpation:

Tenderness: There is presence of severe tenderness with withdrawal ,over and around sternum.

Muscle tone: It was flaccid on first two days .later , became normal.

On Examination:

Higher Mental Function:

Level of Consciousness: On the day of admission Glasgow Coma Scale was 9/15 semiconscious and after 3 days, 12/15 conscious with oriented to person and place, communication response by incomprehensible word.

Cranial Nerve Examination: All nerves are intact except Facial and Hypoglossal nerve.

Sensory Examination: Superficial sensation is intact and deep & cortical sensation was not able to assess as speech was affected.

Dermatome and Myotome: Dermatome is intact & Myotome is absent in right upper extremity.

Motor Examination:

Range of Motion: Right upper limb range and voluntary control was decreased and became normal by day to day physiotherapy rehabilitation.

Muscle Power: According to Manual Muscle Grading, the upper and lower extremity muscle power is reduced initially and it finally improved.

Reflex: There was diminished reflex in right side biceps and triceps tendon.

Balance & Co-ordination: Affected initially and regained normal.

Bowel and Bladder: Normal with Foley's catheterization.

Physiotherapy Rehabilitation Goals:

To achieve the functional independence level and prevent deconditioning, increase muscle strength and joint range, avoid being unaware of the right side of the body, to maintain muscles tone at normal, help keep the cardiovascular and respiratory systems functioning, increase coordination and balance, develop a psychological dependence in the patient.

Day 1:

Right upper limb is moved passively. Right lower limb is actively aided in movement. Both the left upper and lower extremity were taught active movement, chest physical treatment was given.

Day 2:

To the right upper and lower extremities, proprioceptive neuromuscular facilitation was administered. Right upper and lower extremity muscles has received reeducation. The same as before, all other exercises are provided.

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Day 3:

Trunk exercises, Pelvic bridging exercise, Right upper extremity constraint-induced movement therapy (CIMT). diaphragmatic breathing exercises are taught. All prior exercises were included, and techniques for huffing and coughing were explained.

Day 4:

High sitting to half-lying is promoted. Weight transfer was done moving one's weight to the affected side. Exercises that strengthen the wrist, elbow, and shoulders isometrically were taught, muscles in the upper and lower extremities being stretched. All other exercises are continued from the previous day, and chest expansion exercises are introduced.

Day 5:

Teaching of incentive spirometry. facial expression exercises were taught, resistance strengthening exercises was recommended for the right lower extremities. Standing to chair sitting was encouraged, and all other exercises are taught in the same way as the day before.

Day 6:

Active and active-assisted exercises for the right upper extremity were taught later isometric shoulder strengthening exercises were given. With therapist's assistance, gait training was encouraged. Exercises for balance and coordination were taught, while all other exercises are carried over from the previous day.

Day 7:

Resisted strengthening activities were taught to the right upper extremity. Encouraged independent walking without support, with psychological assistance of patient and family education. Family members were advised to motivate and encourage the patient to actively participate in workouts. The patient was later discharged.

Outcomes:

After the session of seven days programme, patient is able to do the activities of daily living like eating, dressing, bathing, walking etc.,. The Functional Independence Measure score was 18% total assistance at admission and it became 64% of minimal assistance during discharge.

Discussion:

The study's objective was to determine if prompt neurological rehabilitation was on improving functional movements after focusing more on chest physiotherapy to avoid chest complications. The patient had rehabilitation treatment for a total of 45-minute per every three sessions during the patient's seven-day hospital stay. The FIM score, which is used to gauge the outcome, improves from total to limited assistance.

Her initial rehabilitation instruction began passively on the first POD when she was unconscious and critically ill in the ICU, and training gradually advanced day by day. The patient only actively participated in rehabilitation sessions in the morning and evening; as in

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afternoon she feels sleepy and may be suffering from medicine side effects. Due to the patient's obesity, two therapists are required for lifting and other aiding techniques.

PNF was employed in rehabilitation treatment by Jorgensen et al. to help patients reach higher functional levels. The effectiveness of stroke rehabilitation therapies, including PNF approaches, has recently been assessed in a number of comprehensive reviews of evidence-based clinical practise guidelines[12,13]. CIMT is primarily based on repetitive, task-oriented training, behavioural methods that improve adherence, and restricting usage of the less affected side[8,14]. By teaching the patient to perform all tasks with the affected limb , we were able to increase the range of motion in the affected shoulder. After reaching the desired range, we began developing muscle strength with isometric and resistive strengthening activities. The muscle tone was first weak and reverted to normal in two days.

According to Elkins and Dentice et al., strengthening the respiratory muscles is a method for improving respiratory muscle strength and lowering respiratory problems after a stroke[15]. Chest physiotherapy, diaphragmatic breathing exercises, chest expansion exercises, and incentive spirometry was used to teach the patient. Initially, however, she found it difficult to perform the exercises; nevertheless, after three days, she responded favourably and her secretions began to clear.

After the patient was moved from critical care on the third day, we began mobilising her. Dickstein et al. reviewed a range of mobility training in three approaches among adult stroke patients[16]. We began with bed mobility exercises and graduated to high and chair sitting over time. The next day, she started walking on her own without the assistance of the therapist. Writing, reading, cooking, dancing, listening to music, playing chess and cards, producing crafts, and other leisure activities can also be incorporated into treatment plans. The patient was discharged with a successful outcome of the rehabilitation after receiving psychological assistance and family education.

These are the rehabilitation interventions that we have trained, but there are also new interventions that can be discussed in future studies, such as remote rehabilitation, biofeedback and sensor training, brain-computer interface, rehab technologies, virtual reality, regenerative therapy, growth factors and modulators, cognitive rehabilitation, etc.

Conclusion:

This case study shows that there is good effect in early rehabilitation of patient with stroke. To reiterate, physiotherapy rehabilitation plays an important role in improving the functional activity at every stage with various technique and training in patient affected with stroke.

Conflict of Interest:

There is no conflict of interest.

Funding sources:

ISSN: 0975-3583,0976-2833 VOL 14, ISSUE 8, 2023

This case study did not receive any specific grant from funding agencies in the public, commercial or not for profit sectors.

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