Impact Physiotherapy Rehabilitation in Cerebellar Stroke: A Noval Case Study

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Introduction:

This case involves a 61-year-old woman who was admitted to the physiotherapy inpatient section of a Pravara Rural Hospital with a diagnosis of posterior circulation ischemic stroke.

Presenting Complaint:

Speech difficulties, slight neck and shoulder tremors (titubation), and difficulty standing and moving by oneself.

Health and Social history:

She was a known hypertensive who took her medications as prescribed; she did not have diabetes or asthma, and she had no prior history of surgery or epilepsy. She was using nifedipine, Aldomet, omeprazole, aspirin, vitamin E, and alphostatin, among other medications. She didn't smoke or drink alcohol, was married with kids, and resided with her family.

Objective Assessment: -

Marked titubation (tremor of the head, neck, and shoulder), minor facial palsy, and expressive aphasia; no discomfort or rigidity in the neck; and no visual impairment.

Trunk and abdomen

Trunk ataxia, fair trunk control, poor balance and coordination, poor vestibulocochlear function; no bladder or bowel dysfunction.

Upper Limbs - Muscle Power (Right- Oxford grade 4, Left 5),

Deep and light sensation - Intact Proprioception – Impaired Tone- slightly decreased Deep Tendon Reflexes – hyporeflexia

• Lower Limbs - Muscle power apparently normal on both sides Sensation - Intact Proprioception – Impaired Tone- slightly decreased Deep Tendon Reflexes - hyporeflexia Ankle Clonus - Not present

• Postural test-Romberg’s sign was positive

• Gait- Only possible with close support and ataxic.

Functional Assessment –
The patient had problems speaking, speaking, and communicating, and was unable to do self-care tasks.

Problem Analysis
Titubation, vestibulocochlear dysfunction, poor muscle tone, balance, and coordination, poor motor and postural control, and facial asymmetry.

Plan of Treatment:
To increase facial muscle function and symmetry, postural balance and coordination, titubation control, functional capacity, cardiovascular efficiency, ambulation training, fall prevention, and caregiver integration into the rehabilitation process as well as the home program. The following objectives were developed with the patient's and his caretakers' (careers') common understanding.

Short Term Goals:
1. In an effort to prevent, control, or treat titubation, the patient would be permitted to wear the cervical collar on a regular basis for 4 weeks, with the exception of when bathing or in pain.
2. At therapy sessions with goals for four weeks, the patient would be able to perform prehensile tasks, including writing abilities, using culturally recognizable materials.
3. The patient would be able to sit or lie down for five minutes while performing both localized and generalized breathing exercises with brief rest periods.
4. The patient would be able to perform rhythmic stabilization exercises for 5 minutes while laying, sitting, and standing.
5. Patient would be able to use finger-to-nose and opposition exercises, as well as heel-to- knee exercise for both upper and lower limbs respectively for a total time of 10 minutes to enhance motor coordination and control
6. Patient would be able to carry out facial exercises in front of a mirror for 5 minutes daily
7. Patient would be able to walk within the parallel bars and exercise on a wobble board for 10 minutes at each treatment session
8. Patient would be able to carry graded weights to improve the tone and power of the musculature of both upper and lower limbs

Long Term Goals
1. Patient would be able to walk independently without the use of a neck collar, mobility aid or stand-by support at the end of the rehabilitation programme.
2. Patient would be able to transfer and ambulate safely for a tolerable distance without falling at the. of the rehabilitation programme.
3. Patient would be able to use his hand to feed and write for as long as he desired.

Means of Treatment:
Treatment Sessions and Development The patient had regular treatment using facial massages, free active activities, mat exercises, bridging, rolling, sitting and standing balance training, breathing exercises, biking, walking inside parallel bars, and wobble boards. The home programme involved repetition of treatment session activities taught to his caregivers who were ascertained competent to effect and supervised them. Increasingly difficult activities were added as the patient's performance improved. The patient first underwent 2 weekly treatment

sessions for the first 9 months, during which time there were noticeable improvements in all functional domains. Then, for three consecutive months, the treatment was changed to once weekly, and finally, once monthly. The cervical collar was first used to manage titubation at the second therapy session, which was fairly early in the rehabilitation trajectory. Titubation considerably decreased after one month of therapy and was eliminated entirely after two months of treatment. All basic beginning positions saw an improvement in balance and postural control. The patient was given a speech referral therapist early in his management without interruption to his motor rehabilitation.

Along the trajectory of treatment sessions, to telling 68 sessions, periodic assessments were carried out and up to approximately 2 years. The assessment of finger to- nose and heel-to-knee as a way of determining motor coordination, balance, precision and timing was taken thrice in 2 fundamental starting positions and the average scores were calculated and recorded (Table 1 and Table 2). Now the patient could walk indoors and outdoors though with a little wide base and very little sways, but never fell at any time whether at the hospital or at home.

Assessment	Right	Left
1st	1.80	1.8
2nd	1.7	1.7
3rd	1.32	1.4
4th	0.9	1.2
5th	0.8	0.8

1. **Finger-to-Nose Exercise in Lying**

1st Assessment	2.9	2.34
2nd Assessment	2.7	2.15
3rd Assesment	2.3	1.2
4th Assessment	1.15	1.5
5th Assessment	1.23	1.1

2. **Finger to Nose in Sitting**

1st Assessment	1.76	1.98
2nd Assessment	1.84	1.7
3rd Assesment	0.97	1.26
4th Assessment	1.25	0.78
5th Assessment	1.60	1.05

3. Heel knee exercise in sitting

Results:

At the time of concluding this case study which was approximately 2 years since treatment began the patient had made unprecedented improvements to the satisfaction of him and his caregivers, as well as us the physiotherapists. He could sit, stand, and walk independently without falling. His posture too had improved and he had good motor power. He could carry out all activities of daily living independently with a score of 100 on the Barthel Index Tables 1 and Table 2 show improvements in coordination and proprioception of the upper and lower limbs. Romberg's sign became negative and titubation had completely disappeared. However, his speech still lacked fluency.

Discussion

Cerebellar stroke is a challenging task for rehabilitation. The length of time, interdisciplinary teamwork and complex interventions used in this study have proved this fact. This case study has shown that physiotherapy plays a great role in controlling sequelae and improving functional task performance and quality of life for patients. Physiotherapists routinely use exercises to promote motor functions, and exercise has been reported to be paramount in promoting neuroplasticity which is the neurophysiological concept that underlies the great improvement for this patient. The length of time taken to treat this patient as well as the consistency in keeping appointments are assumed to have an impact on motor learning as a component of motor behaviour. A very innovative and interesting aspect of this study was the use of the cervical collar in managing titubation. A search of the literature showed this had never been used before. Our using the cervical collar was premised on the assertion that head control is a prerequisite for the motor function of other parts of the body in the neuromotor development of infants. Early application of cervical collar seemed to have considerably contributed to the great results seen because at about one and half years into the study another patient with cerebellar stroke and titubation who had the dysfunction 5 years earlier was referred to the authors. This patient was younger, had never been able to walk independently, had been managed only on medications and never had been referred for physiotherapy. After 6 months of treatment using a cervical collar titubation was reduced but still had not been able to walk independently.

The study has revealed that cerebellar lesions typically impair several aspects of motor function because the cerebellum is responsible for fine motor coordination and body movement, posture, and balance, in this study the authors have taken this fact into consideration in their strategic approach to management which differed from managing a typical upper motor neurone lesion such as the corticospinal tract lesion.

Conclusion:

Physiotherapy a vital role in the management of people with cerebellar stroke. Early referral and intervention, as well as consistency, are crucial in achieving results. Physiotherapists must take responsibility for developing an innovative strategy that works

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