

Case study

TITLE: EFFICACY OF PHYSIOTHERAPY REHABILITATION FOR HEMIPARESIS FOLLOWING CEREBRAL VENOUS SINUS THROMBOSIS: A RARE CASE REPORT

ABSTRACT:

Background: In Cerebral Vascular Disease when one or more arteries are thrombosed it results in Cerebral Venous Sinus Thrombosis (CVST) and affects in all ages. This condition is very challenging as it is not diagnosed early due to diverse signs and symptoms and involvement of extensive collateral circulation. Superior sagittal sinus is a large sinus which is commonly affected. Usually, patient comes with clinical presentation of headache with papilledema, to focal deficit, seizures and coma.

Aim: Efficacy of Physiotherapy Rehabilitation for Hemiparesis following Cerebral Venous Sinus Thrombosis

Presentation of case: A 18-year-old male patient presented with a history of severe headache, weakness in his right arm and leg, dizziness upon rising from bed, and a unilateral headache. On investigation CT scan and MRI brain was done. The physiotherapy has started from 2 days after admission in AVBRH.

Discussion: In the cases of ~~Cerebral~~-cerebral venous sinus thrombosis the management of hemiparesis is shown to enhance the ADL and quality of life of patients.

Conclusion: The rehabilitation protocol planned; will help in improving the range of motion and ADL of patient when started as early as possible.

KEY WORDS:

Cerebral venous sinus thrombosis (CVST), Hemiparesis, Range of Motion (ROM), Rehabilitation

INTRODUCTION:

The incidence of Cerebral venous sinus thrombosis and acute bacterial meningitis in adults are almost same. Ischemic stroke or intracerebral haemorrhage are more common as compared to CVST. CVST is diagnosed with acute and subacute headaches, blurred vision, fainting or loss of consciousness, loss of control over movement in part of body, seizures, coma.(1). Young and middle aged population are mostly affected and women's are more affected than man. The annual incidence of CVST is approximately seven cases per million in the pediatric population (2). Recurrence is rare (less than 10%), and most relapses happen within the

first 12 months_(3). The complications are impaired speech, increased fluid pressure inside the skull, pressure on nerve, developmental delay.

PATIENT INFORMATION:

AAn 18 years old male, is a student of 12th standard with right hand dominant. He gave the history of severe headache two years prior, for which he visited a local physician, who gave him analgesic for relieving pain. He was alert and conscious when he was admitted to the neurology department on October 8, 2021. He had an 80-beat-per-minute pulse and a blood pressure of 120/80 mmhg. He'd been suffering from a severe right-sided headache, weakness in his right arm and leg and sleep disturbances. There was no history of diabetes, hypertension, ~~asthama~~asthma, surgery, trauma, or addiction in the family. The patient consumes a mixed diet, his bladder and ~~bowel-function~~bowel functions normally. CT scan and MRI ~~was~~were done. Following that, the patient was kept in the intensive care unit for 5 days before being transferred to the general ward, where he developed a fever and vomited whenever he was awake.

Comment [V1]: Write full expression first cited

CLINICAL FINDING:

Patient was conscious, co-operative and oriented to time, place and person with MMSE 25/30. On observation attitude of limb in supine position. Pillow under head, right UL and LL is in external rotation. Left UL and LL side was neutral.

Comment [V2]: Write full expression first cited

Comment [V3]: Write full expression first cited

Posture- sitting position in lateral view shows the evidence of forward neck, shoulder protracted, elbow flexed, forearm pronated rested over the thigh, with pelvis anterior tilt, ankle in plantarflexion

Standing position – not assessed as the patient was not able to stand.

Tone examination of the right side was hypotonic for the upper limb and lower limb while for the left side it was normal.

Sensory examination:

~~Superficial, Deep and Cortical sensations was~~ Superficial, Deep and Cortical sensations were intact.

Tone -

Muscle tone (MAS)*	Right Side	Left Side
Upper limb-Shoulder	Grade 0	Normal
Elbow	Grade 0	Normal
Wrist	Grade 0	Normal
Lower limb- Hip	Grade 0	Normal
Knee	Grade 0	Normal
Ankle	Grade 0	Normal

Reflex-

Superficial reflex	Right Side	Left side
Planter response	Babinski positive	Normal
Abdominal response	Diminished (+)	Normal

Deep tendon reflex	Right Side	Left side
Bicep jerk	Diminished (+)	Normal
Triceps jerk	Diminished (+)	Normal

Supinator jerk	Diminished (+)	Normal
Knee jerk	Diminished (+)	Normal
Ankle jerk	Diminished (+)	Normal

Balance – sitting position patient is able to maintain with support

Standing position - patient is able to stand with support

Timeline of events-

Date of admission	8 th October 2021
Date of start of physiotherapy	14 th October 2021
Date of discharge	18 th October 2021
Last date of rehabilitation	Still ongoing

INVESTIGATIONS:

CT anogram was done on 10th October 2021. The reports revealed that ~~the~~there was hyperdensity noted in superior ~~sagittal~~sagittal sinus, straight sinus, right transverse sinus and right sigmoid sinus.

Diagnostic assessment –

As per the investigation patient was diagnosed as a case of Right hemiparesis.

Therapeutic intervention-

In physiotherapy management of right hemiparesis due to CVST, a exercise programmed is be designed for patient.

Short term goals-

Goals	Rationally	Intervention	Weeks / Days
To prevent bedsores	To minimize the pressure due to prolonged immobility	Bed mobility exercises, Positioning after every 2 hours, Water or air bed to reduce pressure,	Till the patient cannot able to do bed mobility by himself.
Trunk control exercise	Reduce back pain, improve trunk balance To improve posture	Pelvic bridging- movements, hip rotations , posterior pelvic tilting exercises. Shoulder – protraction, retraction exercises Static balance exercises in sitting and progressed to	Till the patient cannot able to sit independently. Till the patient achieves a good posture. Should be started 1 week after discharge

		standing.	from hospital.
To prevent tightness	To improve circulation, Prevent contractures .	Passive movements, range of motion , stretching forward bend stretch , standing quads stretch	Started from 1 st day of physiotherapy rehabilitation.
Muscle re- education	To develop motor awareness, voluntary motor response, strength	Static exercises, Active assisted ROM exercises of upper and lower limb, balance exercises.	Should be started from day 1 of rehabilitation.

Long term goals-

Goals	Rationally	Intervention	Weeks / days
strength –upper limb, lower limb	To improve ADL, to gain confidence, regain muscle tone	Static – isometric exercise- plank, low squats, split squats, legs , leg extension ,static	Started as soon as the patient can able to do the ROM exercises of the affected extremity

		lunge, lateral lunge. lateral shoulder rise	independently.
To improve balance	Maintain stability, improve posture.	Weight shifting exercise- standing feet together , stepping activities,	Started as soon as the patient will be able to stand.
Gait training	Improve walking parttenpattern	Frenkel exerciseFrenkel exercise in standing.	Started as soon as the patient will be able to stand.

Follow-up and outcomes:

There was a tremendous improvement in the WHO-QOL post-rehabilitation.

Comment [V4]: Write full expression first cited

Results:

Early rehabilitation for patients with CVST stroke will help for early recovery post-stroke. Basic bed mobility training improves mobility and joint integrity. The vitals were taken into account while targeting the best possible outcome of the patient. Patient will be under regular follow-up and rehabilitation in our department.

DISCUSSION:

Cerebral venous sinus thrombosis is rare form of stroke associated with hemiparesis. For the intervention of hemiparesis, rehabilitation begin in the acute stage is the best option. The reason for this is that bed rest has a negative impact on musculoskeletal, cardiovascular, respiratory, and emotional health, which may cause recovery to be interrupted in the acute stage (4). Even with its therapeutic effects, kinesio taping (KT) is widely used as an adjuvant technique in neuro rehabilitation. (5).— Different exercise are progressively palnned under the short term and long term exercise goals which include prevention of bed sore by bed mobility, muscle ~~redueation~~ reeducation, pelvic bridging, balance exercise , strengthening of affected side and gait training. All this physiotherapy management will help the patient to improve their posture, muscle tone, and stability and ADL of patient.

Conclusion-

Rehabilitation has been shown to be beneficial in improving a patient's condition, resulting in a favourable outcome, as well as raising the patient's confidence and mental health. These methods open up the possibility of starting rehabilitation from the ICU itself, resulting in better outcomes. The earlier the intervention is provided, the better the outcome.

Informed consent: A proper informed consent was taken from the patient prior.

REFERENCES:

1. Ferro JM, Canhão P. Cerebral Venous Sinus Thrombosis: Update on Diagnosis and Management. *Curr Cardiol Rep.* 2014 Jul 30;16(9):523.
2. Capecchi M, Abbattista M, Martinelli I. Cerebral venous sinus thrombosis. *Journal of Thrombosis and Haemostasis.* 2018;16(10):1918–31.

3. Masuhr F, Mehraein S, Einhäupl K. Cerebral venous and sinusthrombosis. *J Neurol*. 2004 Jan 1;251(1):11–23.
4. Abedi S. CHARLES UNIVERSITY IN PRAGUE Faculty of Physical Education and Sport. :77.
5. Lerma Castaño PR, Rodríguez Laiseca YA, Montealegre Suárez DP, Castrillón Papamija DB, Losada Urriago GE. Effects of kinesiotaping combined with the motor relearning method on upper limb motor function in adults with hemiparesis after stroke. *Journal of Bodywork and Movement Therapies*. 2020 Oct 1;24(4):546–53.

UNDER PEER REVIEW