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Case report

Exploring appropriate exercises for rehabilitation in a post-stroke patient with IHD and hypothyroidism

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ABSTRACT

According to a systemic analysis conducted in 2017, the blunt stroke incidence in various parts of India ranged from 44.29 to 559 per 100,000 people over the previous two decades. Stroke is the sudden loss of any neurological function due to a disturbance of blood flow. The majority of stroke victims suffer from long-term disability. We present the case of a 72-year-old woman who was admitted to the hospital with symptoms of fatigue on the left side of her body and facial palsy on the left side**,** on further assessment it was found that patient had coronary artery bypass grafting before 10 years with no post-operative complications and also had a history of hypothyroidism, this brings about the suspicion about the correlation between the stroke with the history of IHD and hypothyroidism. To manage these passive movements breathing exercises, bed mobility exercises, strengthening exercises followed by gait training was given which was highly effective to make the patient independent and return to her daily activities.

KEYWORDS: Hemiparesis, facial deviation, hypertension, hypothyroidism, CABG, Ischemic heart disease.

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INTRODUCTION

According to a systemic analysis conducted in 2017, the blunt stroke incidence in various parts of India ranged from 44.29 to 559 per 100,000 people over the previous two decades [1]. Stroke is one of the most popular and significant fields of neurology to be familiar with in terms of morbidity and mortality, since it is the cause of six million deaths annually around the world [2]. Stoke has a clinical appearance of Sudden (symptoms typically occur suddenly), Slurred Voice, and Side Weakness (face, arm, or leg). The clinical manifestation of a stroke is determined by the region of the brain affected. The American Heart Association/American Stroke Association (AHA/ASA) is a non-profit organization that supports heart health and stroke prevention. Stroke (remember that one or more of your legs can become weak), spinning (vertigo), extreme headache [3]. Patients with ischemic stroke (IS) are at an elevated risk of stroke recurrence after a few years. After this time, coronary death due to ischemic heart disease (IHD) is the leading cause of long-term mortality in IS patients, with an increased risk of death, with an incidence of 1.5–5.4. Circulating thyroid hormone levels seems to regulate the prognosis of ischemic reperfusion injury [4]. Evaluation results have shown that hyperthyroidism increased 38% of the hazard of developing follow-up CVD whereas hypothyroidism increased even higher risk [5]. So this suggests that there is a risk of stroke after CABG. Atherosclerosis is involved in the development of both IHD and IS. Nonetheless, the pathophysiology and etiology of IS are far more complex, and atherosclerosis is just one of many triggers. The intracranial and extra cranial portions of the internal carotid artery may have various degrees of atherosclerosis having hypothyroidism [6]. The goal of physiotherapy rehabilitation include improvements in balance, initiate self-care assessment and promote functional mobility [7]. In this case report, we present a female patient who was an old case of hypothyroidism since 7 years suffered a stroke and underwent medical treatment followed by a comprehensive well-structured physiotherapy rehabilitation that led to improving the functional goals progressively which is a major aspect in leading to a successful recovery in such stroke patients.

Patient information

A 72 years old female admitted to the hospital for the complaint of deviation of the face towards the left side, weakness in limbs of the left side (Hemiparesis) and cold, cough and fever since 8 days. She is diagnosed case of hypertension for 15-20yrs and a history of hypothyroidism. The patient also had a history of Ischemic heart disease (IHD) and had undergone cardiac surgery (CABG) for the same. On examination, the patient was well oriented and vitals

were stable and noted to have mild dysarthria and flattening of the left nasolabial fold. On palpation, tone assessment was done and it revealed low tone on the left side of upper and lower limbs. Reflexes were diminished. For further investigations patient was sent for CT brain and revealed bilateral symmetrical periventricular white matter hypo densities: likely small vessels ischemic changes and age-related atrophic changes and on HRCT thorax revealed cardiomegaly.

Clinical findings

Pre-treatment, arm motor control and gait were measured. Shoulder flexion, elbow flexion/extension, forearm supination/pronation, wrist dorsal extension /palmar flexion) were all found to be decreased on the updated Ashworth Scale. During higher function assessment GCS was found to be Eye-opening: 4, Verbal response: 4, Motor response: 6, she was well oriented, conscious and cooperative to time, place, person, self, and answerable to all our questions. The vision was good, hearing intact, but slurring of speech was present and there was no short term and long-term memory loss. Cranial nerve examination was done, cranial nerves from 1 to 12 were examined, and it showed that the seventh nerve had palsy and other nerves were intact. Sensory examination superficial, deep, and cortical sensation were examined all the senses were intact. Reflexes elicited are deep tendon reflexes which are tabulated in Table 1.

Table 1: Deep tendon reflex

Right	Reflex	Left
Normal	Biceps	++
Normal	Triceps	++
Normal	Supinator	++
Normal	Knee	++
Normal	Ankle	Extensor

Coordination: Non-equilibrium tests were performed which is tabulated in Table 2. Equilibrium test could not be performed.

Table 2: Non equilibrium test

Right	Non equilibrium	Left
Good	Finger to nose	Poor
Good	Finger to finger	Poor
Good	Heel to shin	Poor
Good	Pronation supination	Poor

Posture was assessed and on evaluation, no postural deviation was found. Muscle tone was assessed which showed that the right side was normal and the left side had decreased tone. Muscle power (on MMT) there was decreased power in the upper and lower extremities of the left side while the right side was normal.

Timeline

Table 3: Timeline

Date of CVA	10-01-2021
Date of Hospital Admission	10-01-2021
Date of Discharge	17-01-2021
Date of Physiotherapy rehab initiated	19 -01-2021

Diagnostic assessment

For the diagnosis of problems associated with the patient's day to day life including the activities of daily living and motor function, a motor assessment scale was used. Basic mobility activities were assessed using FIM, which further helped to design the rehabilitation program and achieve the functional goals. Motor assessment scale -Pretreatment score was 20, FIM- pretreatment score was 78.

Therapeutic intervention

For 6 months, the patient underwent physiotherapy sessions. On the basis of practical objectives, physiotherapy operation was designed, with the primary objective of avoiding further complications and enhancing the patient's quality of life. After 2 days of discharge physiotherapy session began.

Phase 1 (0-3 week): The first goal in management was maintenance of muscle properties and the range of motion of all joints. The left ankle, knee, hip and shoulder, elbow, hand, were mobilized passively. To reinforce the muscle recruitment, left upper and lower extremity movements with a 1 kg weight cuff were given to increase strength and improve its involvement in transfers. In the program, motor learning activities were introduced that demonstrated substantial changes over traditional physiotherapy [8]. For painful left shoulder, scapular mobilization was initiated. After 2 weeks, in the gravity-eliminated position, left hip, shoulder active assisted movements were performed. Motor learning programs was undertaken to promote limb movements. In order to promote movement in the trunk and limbs, bed mobility strategies of rolling from supine to side-lying were also introduced. Each exercise was carried out for a minimum of 15 repetitions and gradually was increased based on tolerance. Electrical Muscle Stimulation (EMS) was introduced surged faradic stimulation, 30 contractions for 3 sets, for deltoid, triceps, wrist extensors, flexors was given [9]. As the patient had a history of CABG cardiovascular exercise [10], deep breathing exercises and spirometry was performed [11].

Phase 2 (4-6 week): Mobility exercises were progressed. Patient was assisted to perform from side-lying to bedside sitting then to standing. Transfer procedures and sitting on a chair were taught to the patient and caregivers with moderate to minimal help. In sitting, to stimulate balance response, patient was instructed to lift one leg at a time to move weight through the arm behind and sideways to another leg. Sideways and forward-reaching outs to monitor the trunk were performed to enhance the sitting balance. Technique with mild assistance, namely sitting on the ground with the foot in dorsiflexion to stand exercise of the affected leg while standing, standing with a standard support base for 2 minutes, and marching was performed to improve the standing balance The gait preparation was introduced. The patient walked in a parallel bar in front of a mirror as an input to decrease the propensity to walk with a broad support base, step up was done for 20 repetitions to prepare the patient for the phase of stance. With railing and physiotherapist support, stair climbing was started where the amount of assistance was mild. In 4-6 weeks, deep breathing exercises and expiratory muscle training were also continued and both exercises were prescribed for home programs with the caregivers' minimal assistance.

Phase 3 (7-9 week): Walking was enhanced, and forward-backward and sideways with increased step speed. The exercise program was made more demanding in terms of tempo, intensity, and repetition after the patient had completed all the prerequisites for maintaining equilibrium. With no less than 25 repetitions, all exercises were done. At this point, physiotherapy focused on increasing difficulties in enhancing fine motor activities and targeted activity for functional training to improve daily living activities. Targeted exercises, such as raising the object and holding it to an unstable surface on a stable surface, have been carried out. In addition to this Maximal aerobic exercise greatly affects the level of circulating thyroid hormones, such as Walking or hiking, Jogging or running, exercising on a stair-climber or elliptical machine were introduced [12]. As part of a home routine, all the activities were prescribed, which would indeed increase the responsiveness of the patient to the exercise program [13].

Table 4: Voluntary control grading

Side	Right	Left
Upper limb	Normal	Stage 1
Lower limb	Normal	Stage 2

Table 5: Manual Muscle Testing

	0 week	3 week	6 week
Upper limb	2/5	3/5	5/5
Lower limb	2/5	3/5	5:5

DISCUSSION

Ischemic strokes are caused by a blockage of a blood flow that irrigates the brain, generally as a result of atherosclerotic changes that contribute to cerebral thrombosis and embolism. The diagnosis is made based on the patient's symptoms and a CT/MRI scan of the brain, and care is concentrated on cerebral reperfusion based on the patient's eligibility and presentation time The causes of ischemic stroke were classified by Mohr et al. into three categories: cardiac or aortic brain embolism, cerebral ischemia due to perfusion failure and embolism from the artery to the artery, and cerebral artery thrombosis. Unfortunately, little is understood about strokes in people over the age of 80. Hypertension, atrial fibrillation, and dysleptia are all normal. With age comes a rise in the incidence of arterial hypertension, atrial fibrillation, dyslipidemia, comorbid conditions, and case fatality. Stroke pattern research recently released confirms a rise in the median age of stroke patients as well as comorbidities [6]. In addition to altered metabolism, poorer compliance with treatment, and higher drug interactions due to polyphosphate interactions [14]. Physiotherapy management with intensity and duration altered as per patients need found to be highly effective in treating the patient with stroke with hypothyroidism and AF.

CONCLUSION

Our case study stresses the importance of speaking about a stroke as a secondary complication of ischemic heart disease. Ischemic heart disease raises the risk of stroke in the future, so physiotherapy conservative treatment was used, including passive motions, breathing exercises, bed mobility exercises, strengthening exercises, and gait training.

AUTHOR'S CONTRIBUTION

All authors contributed equally to the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

INFORMED CONSENT

Written & Oral informed consent was obtained from the patient included in the study.

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