

Improvement in heel strike after stroke with hot pack and sustain stretching.

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Abstract

A man 72 year old was retired electrical supervisor officer at defense Nagpur with right hand dominance. He sustained with a small acute non-hemorrhagic infarct in left parietal lobe causes a right side lower limb mono paresis after spending 6 days in the hospital with medication and saline he referred to physiotherapy hospital where treatment started with stretching and strengthening exercises of quadriceps, hamstring and calf muscles of right side lower limb with a weight bearing exercises which gives considerable effect on quality of life of patient. The case report emphasizes the improvement of heel strike activity by giving hot pack and sustained stretching after 1 week of physiotherapy treatment for 20 days with daily physiotherapy treatment.

Keywords: Patient, Stroke, Mon paresis, Physiotherapy treatment.

Introduction

Survivors of stroke and transient ischaemic attacks are at risk of a recurrent stroke, which is often more severe and disabling than the index event. Optimum secondary prevention of recurrent stroke needs rapid diagnosis and treatment and prompt identification of the underlying cardiovascular cause. Effective treatments include organised acute assessment and intervention with antithrombotic therapy, carotid revascularisation, and control of causal risk factors, as appropriate. However, effective treatments are not implemented optimally in clinical practice. Recurrent strokes continue to account for 25–30% of all strokes and represent unsuccessful secondary prevention. Immediate and sustained implementation of effective and appropriate secondary prevention strategies in patients with first-ever stroke or transient ischaemic attack has the potential to reduce the burden of stroke by up to a quarter [1].

Stroke is the second leading cause of death and a major contributor to disability worldwide. The prevalence of stroke is highest in developing countries, with ischemic stroke being the most common type. Considerable progress has been made in our understanding of the pathophysiology of stroke and the underlying mechanisms leading to ischemic insult. Stroke therapy primarily focuses on restoring blood flow to

the brain and treating stroke-induced neurological damage [2]. Lack of success in recent clinical trials has led to significant refinement of animal models, focus-driven study design and use of new technologies in stroke research. Simultaneously, despite progress in stroke management, post-stroke care exerts a substantial impact on families, the healthcare system and the economy. Improvements in pre-clinical and clinical care are likely to underpin successful stroke treatment, recovery, rehabilitation and prevention. In this review, we focus on the pathophysiology of stroke, major advances in the identification of therapeutic targets and recent trends in stroke research [3-5].

Stroke can leave individuals with short- and long-term disabilities. Daily activities like walking and toileting are often affected, and sensorimotor and visual impairment are common [6]. Rehabilitation aims to reinforce the functional independence of people affected by stroke. It includes working with patients and families to provide supportive services and post-stroke guidance after 48 h of stroke attack in stable patients. Stroke rehabilitation may involve physical, occupational, speech and/or cognitive therapy. It is designed to assist patients to recover problem-solving skills, access social and psychological support, improve their mobility and achieve independent living. Rehabilitation may also

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include neurobiological tasks designed to lessen the impact of cognitive dysfunction and induce synaptic plasticity, as well as long-term potentiation [7].

Task-oriented approaches, like arm training and walking, help stroke patients to manage their physical disability, and visual computer-assisted gaming activities have been used to enhance vasomotor neuronal plasticity [8].

Mono plegia is a type of paralysis that impacts one limb most often an arm but it can also affect one of your legs sometimes it can be a temporary condition but in other cases it can be permanent. When a part of the nervous system becomes damaged it can disrupt the signaling activity to a muscle or muscle group this can lead to muscle weakness that is paresis/paralysis in the affected area. Damage to the nervous system can include the brain, spinal cord or one or more nerves and affect a limb on either the upper or lower part of the body [9].

Patient's history

A 72-year-old male with right-hand dominance, a retired electrical supervisor officer at Defense Nagpur, presents with a complaint of weakness in the right side of the lower limb, difficulty in walking, sitting to standing, stair climbing up and down. Before referred to physiotherapy, he went to a private hospital and was admitted for 6 days, took medications and saline, then started physiotherapy treatment.

Examination Finding

Subjective

- Age: 72-year-old male
- Address: Matoshrinagar, Hingna
- Chief complaint: patient presents with a complaint of weakness in the right lower limb, difficulty in walking, sitting to standing, stair climbing up and down.
- Medication: Ciprofloxacin 90mg, Prevacid 20mg, Prodep 20mg, Homin D3, Prexarone plus.
- Social history: retired electrical supervisor officer at Defense Nagpur. Lives with his son and daughter in law and 2 grandchildren in a 2nd-floor house. Socioeconomic status: upper middle class (by Kuppu Swami scale).

Observation

- Altitude of limb: in supine position hip externally rotated, knee extended, foot averted & dorsiflexed.
- Posture: in anterior view right side of shoulder depressed, knocked knee present.
- Gait: short stoppage gait without heel strike.

Examination

Higher mental function

Patient is conscious (by GCS). Well oriented to time, place and person. Speech intact. Memory intact (by MMSE).

Motor examination

- Tone: (by modified Ashworth scale) grade 1 on affected side of lower limb.
- Voluntary control: grade 5 on affected side of lower limb.

ROM

- The ROM is reduced in the affected side as compared to the unaffected side.
- MMT: Quadriceps muscle grade 3
- Hamstring muscle grade 3
- Gastrocnemius & soleus grade 3 on affected side of lower limb.

Reflex testing: plantar reflex absent; Achilles tendon reflex absent; patellar reflex grade 3 brisk on affected side of lower limb.

- Cranial nerve, sensation, coordination Examination: Intact
- Balance: by Berg balance test 49 out of 56.
- Functional assessment: by FIMS grade 7 (Table 1) (Table 2) (Table 3).

Physiotherapy Treatment Protocol

To improve heel strike while walking

Give hot pack to the (plantar flexors) calf muscles of leg 2 times daily for 10 min up to 20 days with a sustained stretching to the plantar flexors of foot (gastrocnemius, soleus, tibialis posterior, flexor hallucis longus, flexor digitorum longus, plantaris, peroneus longus and brevis) with a 30 sec hold and 15 repetitions per day for 20 days. Which gives considerable increase in dorsiflexion of foot which helps to improve the heel strike while walking.

Out comes: after intervention program

- Gait: considerable heel strike seen on affected side
- Voluntary control: grade 6 on affected side of lower limb

ROM

- Considerable increase in ROM seen after intervention.
- MMT: quadriceps grade 4; hamstring grade 4; gastrocnemius & soleus grade 4 on affected side after intervention.
- Reflexes: intact
- Balance: 56 out of 56 by Berg balance scale.

Table 1. Intervention of the Hip joint seen on patient's strength.

Hip joint	Right side	Left side
Flexion	0-90	0-125
Extension	0-15	0-30
Abduction	0-30	0-45
Adduction	0-15	0-25
Internal rotation	0-20	0-26
External rotation	0-15	0-24

Table 2. Intervention of the Knee joint seen on patient's strength.

Knee joint	Right side	Left side
Flexion	0-80	0-120
Extension	80-0	120-0

Table 3. Intervention of the Ankle joint seen on patient's strength.

Ankle joint	Right side	Left side
Dorsiflexion	0-9	0-16
Plantar flexion	0-27	0-42
Inversion	0-18	0-28
Eversion	0-6	0-10

Table 4. Intervention of the Hip joint seen on patient's strength.

Hip joint	Right side	Left side
Flexion	0-120	0-125
Extension	0-26	0-30
Abduction	0-45	0-45
Adduction	0-22	0-25
Internal rotation	0-24	0-26
External rotation	0-22	0-24

Table 5. Intervention of the Knee joint seen on patient's strength.

Knee joint	Right side	Left side
Flexion	0-120	0-120
Extension	120-0	120-0

Table 6. Intervention of the Ankle joint seen on patient's strength.

Ankle joint	Right side	Left side
Dorsiflexion	0-15	0-16
Plantar flexion	0-40	0-42
Inversion	0-24	0-28
Eversion	0-10	0-10

Therefore after the treatment/ intervention the patient's strength, ROM, voluntary control & gait pattern improve considerable heel strike seen on affected side (Tables 4-6).

Conclusion

After 20 days of treatment of patient the dorsiflexion ROM increases from 0-9 to 0-15 degree. While walking considerable heel strike seen on affected lower limb (right side). It is given that the good outcome was achieved by giving sustained stretching and hot pack to the patient. Which is good for his gait/ locomotion activity?

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