



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2023; 10(1): 250-255
© 2023 IJPESH
www.kheljournal.com
Received: 19-11-2022
Accepted: 29-12-2022

Mithu Thomas
MPT (Community
Physiotherapy), School of
Medical Education, Kottayam,
Kerala, India

Ansu Riya George
MPT (Community
Physiotherapy), School of
Medical Education, Kottayam,
Kerala, India

Corresponding Author:
Mithu Thomas
MPT, Musculoskeletal and
Sports, School of Medical
Education, Kottayam, Kerala,
India

To evaluate the significance of physiotherapy as a member in stroke rehabilitation team in Punarnava project

Mithu Thomas and Ansu Riya George

Abstract

Objective: To evaluate the significance of Physiotherapist In a stroke rehabilitation team in Punarnava Project.

Method: 60 Post her paretic MCA Stroke Patients in punarnava project who filled the Inclusion criteria were selected through no Probability convenient sampling and were grouped In to two, the control and experimental group. The control group received ayurvedic treatment. The Experimental Group received Physical therapy in addition to Ayurvedic treatment. Outcome measures used Barthel Index scales and stroke specific quality of lite scale.

Result: The result of this study showed a significant Improvement in patients receives physiotherapy along with ayurvedic treatment.

Conclusion: Physiotherapist has a significant role in stroke rehabilitation team.

Keywords: Hemiparetic patients, MCA stroke specific quality of life scale

Introduction

Stroke, also known as CVA is an acute neurologic Injury in which the blood supply to a Part of the brain is interrupted. Stroke is defined as “rapidly developing clinical sign of focal [or global] disturbance of cerebral Function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin” WHO, May 7, 2013.

Stroke is the 3rd leading cause of death and second leading cause of disability. On the basis of latest study the stroke incidence and Stroke related case fatality rates in India are higher relative to western Industrialised Nations. In India annual Incidence of stroke rate was 135/100000 Population. In the age group greater than 20 years with the male to female ratio being 1:7. It is reported that 12% of total death occurs in India due to stroke [Sridhar Alla it al 2007]. The Prevalence rate for North Kashmir 143/100000, West Mumbai 220/100000. In Kerala stroke Incidence 117/100000 Popular [Trivandrum Stroke Registry].

The main risk factor for stroke is high blood pressure. Other risk factors include tobacco smoking, obesity, high blood cholesterol, diabetes mellitus, previous TIA, and atrial fibrillation among others. An ischemic stroke is typically caused by blockage of a blood vessel. A hemorrhagic stroke is caused by bleeding either directly into the brain or into the space surrounding the brain. Bleeding may occur due to a brain aneurysm. Diagnosis is typically with medical imaging such as CT scan or MRI scan along with a physical exam. Other tests such as an electrocardiogram (ECG) and blood tests are done to determine risk factors and rule out other possible causes. Low blood sugar may cause similar symptoms.

MCA is a branch of internal carotid artery. This artery had superficial and deep hemisphere branches. Through its cortical branches, it supplies the lateral part of the cerebral hemisphere, Its cortical territory encompasses (1) cortex and white matter of the lateral and inferior parts of the frontal lobe. Including motor areas 4 and 6, controversies centers for lateral gaze and motor speech area Brocas (dominant hemisphere); (2) cortex and white matter of the parietal lobe, including the sensory cortex and the angular and supra marginal convolution; and (3) superior parts of the temporal lobe and insula, including the sensory language areas of Wernicke. The deep penetrating or lenticulostriate branches of the middle cerebral artery supply the putamen part of the head and body of the caudate nucleus, the outer globus pallidus, the posterior limb of the internal capsule, and corona radiata (Allan H Robert H Brown, 2005).

The affected side of body may feel different. Limbs may feel heavy because the weakness makes difficult to move, or they may feel numb [like after you have had an injection at the dentist]. Some people have more unusual sensations such as pins and needles, hot and cold sensations or feel as though water is running down their limb.

Occasionally they can be painful Joints on affected side, such as shoulder, may be vulnerable to injury, for example if arm is pulled or its weight is allowed to 'drag'. This can cause a painful dislocation (called subluxation) or 'frozen shoulder, where shoulder becomes painful and difficult to move.

Medical doctors are often stunned by the range of choice of Physiotherapeutical approaches; unacquainted with the techniques of researchers such as Bobath, Brunnstorm Clayton, Coulter, Fay, Kabat, Knott, Road and voss, and unfamiliar with theories behind these techniques.

After a stroke, brain cannot grow new cells to replace the once that have been damaged, So recovery depends on brains ability to reorganize its undamaged cells and make up for what has been lost. This is called Neuroplasticity. Physiotherapy can provide expert Practical guidance to help.

Punarnava is a project implemented by State Government of Kerala in 2013 to management and rehabilitation of Post Cerebro Vascular Accident [CVA] cases. Punarnava Provide Funding and technical assistance to hospital to develop, treatment assistance for stroke Patients in 2 selected district hospitals of Kerala under ISM departments, 25 post CVA cases from each districts are selected for this purpose. Basic management protocol comprises of IP Management 3 to 4 weeks and OP Management for 90 days. The services from a Physiotherapist is available only in one organization (Kottayam) other rehabilitation team lacks the service.

Methodology

Inclusion Criteria

- Age group between 45 -65
- Patient with first episode of MCA
- Sex both female and male
- Able to understand

Exclusion Criteria

General Exclusion Criteria of Punarnava Project

- Aneurysm
- Uncontrolled diabetes mellitus
- Polar intracranial bleed
- Active Internal bleed
- Bleeding diathesis
- BP>185/110
- Pregnant
- Post- MI Pericarditis
- Potentially dangerous cardiac conditions

Exclusion Criteria of this Study

Neurological Problems

- Aphasia
- Apraxia
- Cerebellar Problems
- Brain tumors
- Seizures
- Peripheral neuropathy
- Degenerating and demyelinating diseases
- Other neurological Problems
- Proprioceptive disturbance
- Dementia.

Orthopaedics Problems

- Recent acquired deformities
- Arthritis

- Recent fractures and soft tissue injuries
- Recent surgeries
- Other orthopedic Problems.

Cardio – Thoracic Problems

- Acute MI
- Recent Surgeries
- Cardiac Pacemakers
- Severe hypertension

Other Problems

- Other problems like uncontrolled diabetes
- Visually and auditory challenged persons
- Any medical and surgical problems
- Postural hypotension

Time and Duration of the Study

The total duration of this study was six months, of which three months was for data collection and three months for documentation.

Out Come Measurement

- Barthel index scale
- Stroke specific quality of life scale

Procedure for the Study

60 subjects who are fulfilling the inclusion criteria will be recruited using non probability convenient sampling and allocated into the groups. Namely control group [Group A] and experimental group [Group B]. Each group contains 30 patients each.

Group A - Receives Ayurvedic treatment

[Patients from Kozhikode Govt. Ayurveda hospital]

Group B - Receives Ayurvedic treatment and Physiotherapy treatment

[Govt. Ayurveda hospital Kottayam]

Treatment Protocol

Group A [Control Group]

Ayurvedic Treatment

- Udwarthanam/Dhanyamala Dhart
- Tailasnehapana
- Panda Swedam
- Yapuna Vasthy

Group B [Experimental Group]

In addition to the Ayurvedic treatment mentioned above, this group will receive Physiotherapy treatment

Active Assisted Rom Exercise

Upper limb

- Shoulder girdle protraction, retraction, retraction, depression
- Gleno-humeral joint flexion, extension, adduction, external rotation, Internal rotation
- Elbow joint-flexion, extension
- Radioulnar joint-supination, pronation
- Wrist joint-flexion, extension, radial deviation, ulnar deviation
- Metatarsophalangeal joint-flexion, extension
- Interphalangeal joint-flexion, extension

Lower limb

- Hip joint-flexion, extension, abduction, adduction, internal rotation,

- External rotation
- Knee joint-flexion, extension.
- Static Quadriceps exercises
- Ankle joint-dorsi flexion, plantar, eversion, inversion.
- Metacarpophalangeal joint-flexion, extension
- Interphalangeal joint-flexion, extension

Functional Mobility Exercise

Activities in sitting

- Weight transference from side to side with feet separated
- Weight transference through the arm sideways and arms behind
- Moving in sitting
- Sitting to standing without support

Activities in standing with assistance

- Weight shifting on the affected leg-place the sound leg on a step in front and then to side
- Stepping up with the affected leg on the step and then lower the sound leg further down to the floor
- Stepping up with the affected leg on the step, step up and lower
- Walking in parallel bar in front of the mirror
- Walking sideways in parallel bar
- Walking aided and unaided
- Stair climbing exercise- going up and down stairs

Gait Training

- Walking in parallel bar
- Walking sideways in parallel bars
- Walking without support

Balance Training

Activities in Sitting

- Reaching forward to touch the floor
- Reaching forward with clasped hand

Strategies to Manage Spasticity and Synergy and Synergy Pattern

- Stretching of spastic muscles.
- Rhythmic rotation.
- Sustained icing.
- Cognitive relaxation techniques.
- Position the limb in a lengthened and weight bearing position, like the shoulder is extended, abducted, and externally rotated with the elbow, wrist and fingers extended.

Analysis and Interpretation

Table 1: Comparison of the Barthel Index scores of patients in Kottayam and Kozhikode

| Ranks | | | | |
|---------------|-----------|----|-----------|--------------|
| | dist | N | Mean Rank | Sum of Ranks |
| Barthel Index | Kottayam | 30 | 42.82 | 1284.50 |
| | Kozhikode | 30 | 18.18 | 545.50 |
| | Total | 60 | | |

| Test Statistics | |
|-----------------|---------------|
| | Barthel Index |
| Mann-Whitney U | 80.500 |
| Z | 5.503 |
| Significance | .000 |

Table 2: Comparison of the SSQL scores of patients in Kottayam and Kozhikode

| Ranks | | | | |
|--------------------|-----------|----|-----------|--------------|
| | dist | N | Mean Rank | Sum of Ranks |
| SS Quality of Life | Kottayam | 30 | 40.68 | 1220.50 |
| | Kozhikode | 30 | 20.32 | 609.50 |
| | Total | 60 | | |

| Test Statistics | |
|-----------------|--------------------|
| | SS Quality of Life |
| Mann-Whitney U | 144.500 |
| Z | 4.543 |
| Significance | .000 |

Conclusion: The value of the Z statistic is 4.543 which is significant at 5% level. Hence we reject the null hypothesis. That is there is significant difference between the SSQL scores of the two groups at 5% level of significance. The SSQL scores of the patients in Kottayam are greater than that of the patients in Kozhikode.

Null hypothesis H0: There is no significant difference between the ages of the two groups.

Table 3: Comparison of ages of control and experimental groups Statistical Tool used is the two sample t test

| Group Statistics | | | | |
|------------------|-----------|----|-------|----------------|
| | dist | N | Mean | Std. Deviation |
| age | Kottayam | 30 | 58.17 | 5.440 |
| | Kozhikode | 30 | 57.50 | 6.191 |

| Independent Samples Test | | | | |
|--------------------------|-------------------------|-------|----|--------------|
| | | T | df | Significance |
| a | | | | |
| age | Equal variances assumed | 0.443 | 58 | 0.659 |

Conclusion: The value of the t statistic is 0.443 which is not significant at 5% level. Hence we accept the null hypothesis. That is there is no significant difference between the ages of the two groups at 5% level of significance

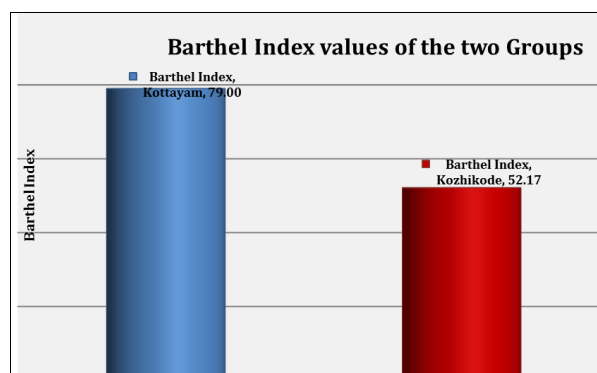


Fig 1: Figure illustrate the comparison of barthel index values of study grupos The score of Kottayam is 79 and Kozhikode is 52.17

Table 4: Figure illustrate the comparison of SSQL scores of study groups. The score of Kottayam is 187.67 and Kozhikode is 146.07

| Report | | | |
|-----------|-------|----|----------------|
| Age | | | |
| Dist | Mean | N | Std. Deviation |
| Kottayam | 58.17 | 30 | 5.440 |
| Kozhikode | 57.50 | 30 | 6.191 |
| Total | 57.83 | 60 | 5.788 |

| | Male | Female | Total |
|-----------|------|--------|-------|
| Kottayam | 21 | 9 | 30 |
| Kozhikode | 15 | 15 | 30 |
| Total | 36 | 24 | 30 |

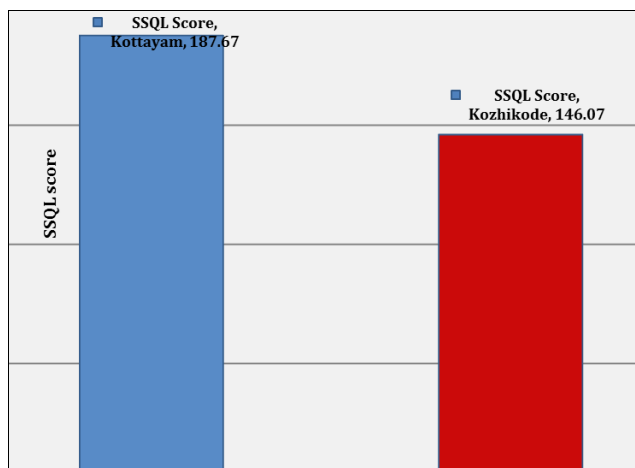


Fig 2: Comparison of the SSQL scores of the two Groups

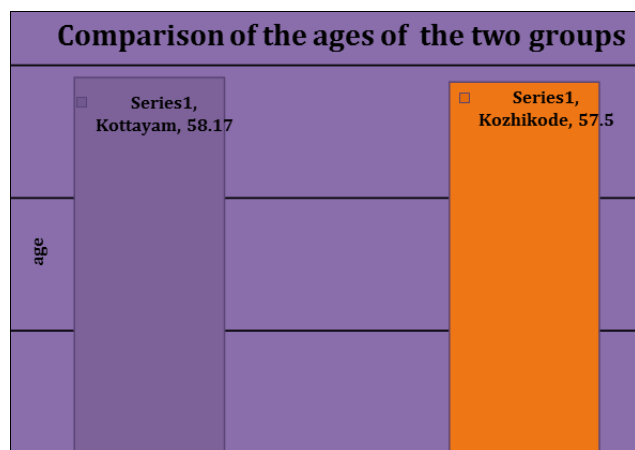


Fig 3: Comparison of the ages of the two groups

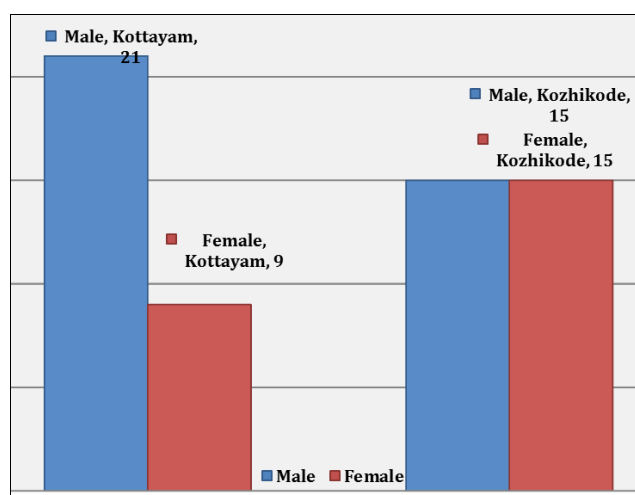


Fig 4: Male and Female Patients in the sample

Discussion

Canadian physiotherapy association (2012) Physiotherapy for stroke survivors is an integral part of rehabilitation treatment Plan. As a member of stroke teams, Physiotherapist address Physical Function issue and Prevention of Subsequent Strokes, which are determinants of quality of life (QQL) This study was an experimental approach to evaluate the significant of physiotherapist as a member in stroke

rehabilitation team in Punarnava. The sample for the study includes 60 subjects of age between 45 and 65. The subjects were divided into 2 groups group A (control group) group B (experimental Group) each group consists of 30 subjects. Control group consists of 15 female and 15 male and experimental group consists of 21 and 9 males. The outcome measurements were Barthel index scale stroke specific quality of life scale.

Both groups, control and experimental group received Ayurvedic treatment which consists of udwarthanam, Tialasnehapana, pandaswedam, Yapunavasthy. Along with this group B receives Physiotherapy treatment such as active assisted Range of Motion Exercise, strengthening exercise, Spasticity Management balance Mobility Exercise activities in standing with assistance and gait training. The Mean Score of Barthel Index Scale of Kottayam is 79 and stroke specific quality of life is 187.67 and Barthel Index of Kozhikode is 52.17 and stroke specific quality of life is 146.07. When comparing the ages and control of experimental group the value has no significant difference. The score of Barthel Index Scale and Strock Specific quality of life scale showed significant improvement in the Kottayam group. This is because Kottayam group includes physiotherapy.

Lena M Nilsson & Lena A Nordhalm (1997) conducted a study on Physical therapy in Stroke rehabilitation; Base of for Swedish Physiotherapists choice of treatment the aim of the study were to Investigation Physiotherapy treatment, attitude among Physiotherapist who works, with stroke patients and the study concluded that treatment was evident among 75% of the respondents. The above study positive correlates with present study, where the experimental group showed improvements.

Peter Langhorne, Robert Wagennas and Dr. Cecily Patridge (2012) conducted a study on Physiotherapy after stroke. A heterogeneous group of seven randomised trials 597 patients was identified Dichotomus outcomes (death or the combined poor outcome of death or deterioration) were analyzed. The study concluded that more intensive. Physiotherapy was associated with a reduction in the combined poor outcome of death or deterioration may enhance the rate of recovery. The above study positively correlates with present study, where the experimental group showed improvements.

Kerra, ROWE D, Esson D, Barbe em Physiotherapy (2015) changes in the Physical activity of acute stroke survivors between inpatient and community living with early supported discharge; an observational control study is to describe and compare patterns of physical activity among stroke survivors during their hospital stay and community living with early support discharge. The conclusion is community living promoted higher level of physical activity in medically stable Stroke survivors.

Astanga Sangarah (1996) Pakshaghtha is the Ayurvedic team for paralysis. The Ayurvedic text generally attributes such condition to a block in Vata Movements. Udwarthanam is special terapuetic deep tissue massage using herbal power. Snepana is a type of poorva karnna procedures in panchakarma Snepana Stands for lubrication of body systems by administration of fatty substances. Swedanam is a passive body heat therapy which causes haemodynamic changes. Yapuna Vasti plays a vital role and it ensure result and guaranteed relax to Vata disorders. These are the treatment given for Stroke patients in Kottayam and Kozhikode centers in addition to this Kottayam receives Physiotherapy treatment Dena gardiner (2005)- Assisted resisted exercise is a type of exercise constitute a combination of assistance and resistance

during a single movement. Physiologically Muscles are capable of exerting their greatest strength. When they are fully extended, in their outer range and as they shorten their force diminisher. However it is modified in the case of some muscles by mechanical factors such as the angle of pull of the tendon of insertion, the effect of the pull on the lever is greatest when the angle at pull approaches a right angle.

Susan Sullivan (2007) ^[27] spasticity benefit from interventions designed to modify or reduce tone. Those include early Mobilizations combined with elongation of spastic muscles and sustained stretch through positioning.

Movement control activities that promote normal postural alignment and control and functional use of extremities. Conventional gait training focuses on improving the Mechanics of quality of walking. Gait practice with an overhead harness and partial body weight support provides the least interference with balance and walking.

Balance training following stroke; effects of task oriented exercise with and without sensory input - International journal of rehabilitation Research (2006). The purpose of the study was to compare the effect of a task oriented exercise sensory input on postural stability in subjects with stroke. 16 hemiparatic subjects, atleast 6 months post strokes, were randomly assigned to the experimental or control group and participated in an 8 week task oriented exercise. Programe focusing on balance and mobility exercise. It is concluded that a task oriented exercise program assisted by sensory manipulation is more effective at improving the standing balance of stroke subjects than a conventional task oriented program. The above study positively correlates, with present study, where the balance training is effective for stroke patients.

Community walking training program improves walking function social participation in chronic stroke patients - Tohoku J Exp Med (2014). Stroke patients live in balance and walking dysfunction. The purpose of the study was to investigate the effect of Community Walking Training programme (CWTP) with in the real environment on walking function and social participation in Chronic Patients. Twenty two Stroke patients were randomly assigned to either the CWTP group, or the control groups. The findings demonstrate the efficiency of CWTP on walking function and social participation improved morely CWTP group compared with the control group ($P < 0.05$)

Barbo B Johnson (2000) - Journal Published by American heart association, brain plasticity contributes to functional recovery from paralysis forced use of hemiplegli side after brain damage lead to changes in Motor Context Repetitive motor action facilitation techniques increase the excitability in the motor cortex and repetition of voluntary movement might influences the plasticity of brain. In an article Rehabilitation with post stroke motor recovery a review with a focus on Neural Plasticity by Naoyuki and rhinzone (2001) ^[19], stated that meaningful, repetitive, intensive and task specific movement training in an enriched environment lead to motor recovery. Approach to therapeutic exercise and activity for Neurological and developmental conditions (Bobath and Brunstorm appoches) therapeutic exercise Mary Grace M Jordan PTRP (2009) ^[18]. Part of the body where the therapist can most effectively control and change patterns of posture and movement. In other body parts use Key Point control, Stabilization improves the distal function. Neuro developmental treatment approach by Janet Howele (2002) the tone in direct muscles by controlling the tone of proximal muscles. Physiotherapy focuses on restoring physical function

following stroke. Physiotherapy has a positive impact in the prevention of acute events and support that individuals ability to live independently through targeted interventions aimed at improving balance strength, co-ordination and function. Physiotherapy focuses on restoring physical function offers a positive outcome to stroke patient, through low risk activities result in high potential satisfaction. Stroke survivors report that they could benefits from physiotherapy. There is strong research evidence to support physiotherapy specialized stroke units service in management of stroke. participants in rehabilitation programs post stroke increases social and physical functions and has a positive impact. Physiotherapy services following stroke reduces the risk for poor health outcomes, increases daily living and personal activity and reduces costs of health cure system.

Physiotherapy management is based upon a holistic problem solving multi disciplinary approach aimed at the promotion of independence improved function, maximization of activity, minimization of symptoms and prevention of abnormalities. The significant result for experimental group over the control group might be due to addition of physiotherapy treatment to the conventional treatment. Hence the discussion can be concluded as Physiotherapist has a significant role in stroke rehabilitation team.

Conclusion

Punarava is a State Government Project for stroke patients, Implemented in two Districts in Kerala, (Kottayam and Kozhikode) Kozhikode group received Ayurvedic treatment and Kottayam group received Physiotherapy along with Ayurveda. The outcome measures Barthel Index and stroke specific quality of liFe Scale showed a Significant Improvement in Kottayam Group than Kozhikode group thus based on this study, it can be concluded that Physiotherapist has a Significant role in Rehabilitation.

References

1. AHA. American Heart Association. Heart disease and Stroke Statistics-2008 update, 2008.
2. Asanuma H, Keller A. Neuronal mechanisms of motor learning in mammals. *Neuroreport*- 1991;2(5):217-24.
3. Barbro B, Johansson MD PhD. Brain plasticity and stroke rehabilitation. Published by American Heart Association. *Stroke* – 200;31:223-230.
4. Carolee Westein J, PHD, PT, FAPTA. Neuro Rehabilitation in Stroke. Past, Present and Future Western States Stroke Consortium Scattle WA, Sep 13-14, 2003.
5. Committee for Physical Therapy, Protocol Office of Physical Therapy, Ministry of Health- Kuwait. Physical therapy Protocol for Acute Adult stoke in India Fastsheet Hemiplegia.
6. Daniel I, Slater MD. Middle cerebral artery overview of middle cerebral artery stroke. Dec 2011
7. Fiona Taylor C. Stroke in India. South Asia Network for Chronic Disease, 1-4.
8. Fiona Taylor C, Suresh Kumar K. South Asia Network for Chronic Disease. IIPH Hyderabad Publuic Health Foundation of India, 2012.
9. Jagathesan Alagesan, Surbala Devi L, Vaiyapuri Anandh. Comparative Study on the Strengths of Ipsilateral Upper Extremity of Stroke Subjects and Normal Individual, 2011.
10. Jerome Sanes N. Neocortical mechanisms in motor learning.

11. Judith Schaechter D. Motor Rehabilitation and Brain Plasticity after Hemiparetic Stroke: progress in neurobiology. 2005;73(2004):61-72.
12. Judy Honer, Thomas Mohr, Randy Roth. Electromyographic Biofeedback to dissociate an upper extremity synergy pattern, A case report. Journal of the American Physiotherapy Association and de Fysiotherapeut. PHYSIOTHERAPY, 62, 299-303.
13. Julie Vaughan Graham, Catherine Eustace, Kim Brock, Elizabeth Swain. Bobath concept in contemporary clinical practice. Top stroke Rehabili, 16(1),57-68
14. Kagoshima University Graduate School of Medical and Dental Science Department of Rehabilitation and Physical Medicine.
15. Kazumi Kawahira, Megumi Shimodozono, Seiji Etoh. Effect of intensive repetition of a new facilitation technique on motor functional recovery of the hemiplegic upper limb and hand. Brain injury. 2010;24(10):1202-1213.
16. Dipietro L, Krebs HI, Fasoli SE. Changing Motor Synergies in Chronic Stroke. J Neurophysiol 2007;98:757-768.
17. Lt Col KM Hassan, Brig Rohatgi S. Brain Attack, Time of Action. 2009;65:62-65
18. Mary Grace M, Jordan PTRP. Approaches to Therapeutic Exercise and Activity for Neurological and Developmental conditions (Bobath and Brunnstorm approaches).
19. Naoyuki Takuchi, Shin_ Izumi. Stroke research and treatment. Hindawi publishing corporation, volume 2013, article ID 128641. Nathaniel H Mayer, MD, Alberto Esquenazi MD. Muscle oversctivity in the upper motor neuron syndrome.
20. Nathaniel H, Mayer MD, Alberto Esquenazi MD. Muscle overactivity in the upper motor neuron syndrome.
21. Richard Zorowitz Md, Edgardo Baerga MD, Sara Cuccurullo MD. Stroke Rehabilitation.
22. Sid Shah MD, Foundation for Education and Reserch in Neurological Emergencies.
23. Sridharan SE, Unnikrishnan S *et al.* Incidence, Type, Risk factors and Outcome of stroke in a developing Country; the Trivandrum stroke registry, published by Thr American Heart Association, stroke. 2009;40:1212-1218.
24. Steven Graham H, Robert Hicky W. Molecular pathophysiology of stroke.
25. Darcy Ann umphred neurological rehabilitation:4th edition, 2001
26. Patricia Downie A. "Cash's Text book of Neurology for physiotherapist" 4th edition.
27. Physical Rehabilitation by Susan B O' Sullivan. Thomas J Schmitz fifth edition, 2007
28. Kenneth Lindsay W. Man Vone, Neurology and Neurosurgery illustrated. 4th edition.
29. Roongroj Bhidayasiri, Michael Wasters F, Christopher Giza C. Neurological Differential Diagnosis. A prioritized Approach, 2005.