Role of Physiotherapy on Quality of Life in Stroke Survivors – A Systematic Review

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Abstract

Background: Stroke is one of the most common disease with lots of impairments and disabilities. Prevalence of stroke is increasing day by day globally. Young stroke is becoming very common. The overall functional capacity of the individual is hampered where the prognosis is question mark. It largely depends upon site, stage, duration of lesion. The overall quality of function is deteriorated. Patients live their lives with dependency. According to previous studies, role of various health care professionals have been analyzed and studied. Physiotherapy is a branch where use of exercise and electrotherapy plays their role in rehabilitating patients with stroke

Aim: To study the role of physiotherapy on quality of life in stroke survivors.

Methodology: A systematic narrative review was conducted to find out the efficacy of physiotherapy treatment on quality of life in stroke survivors.

Conclusion: Stroke has complex process of recovery. Stroke survivors are left with disabilities. It causes depression in patients as well as their family members. Physiotherapy has a significant role in improving impairments and disabilities. This in turn helps in improving quality of life

Keywords: *Physiotherapy, Stroke, Quality of life, Systematic narrative review.*

Introduction

The Constitution of the World Health Organization (WHO) defines health as "A state of complete physical, mental, and social well-being not merely the absence of disease."

It involves accessing health not only in terms of effects of health care, indication and severity of diseases but also focuses on well being by measuring the quality of life related to health care. WHO defines Quality of Life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is largely affected by individual's psychological beliefs, physical health and social involvement. It serves as a reference against which an individual or society can measure the different domains of one's own life. It is the general well-being of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including everything from physical health, family, education, employment, wealth, safety, security to freedom, religious beliefs, and the environment[1].

Quality of life and general health has various domains. Broadly they include physical health, psychological, level of independence, social relations, spirituality/ religion/ personal beliefs and environmental factors.

Quality of life is largely affected by type of food consumed, education, family life, emotional security, opportunities for activities etc. Health is one of the major issues that affects a persons quality of life.

Stroke and quality of life:

In 1970, the World Health Organization defined stroke as 'rapidly developed clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause

other than of vascular origin'[2].

Globally, cerebrovascular accident (stroke) is the second leading cause of death and the third leading cause of disability[3]. The ratio of stroke is largely based in low and middle income countries. Death and disability is very common after stroke. In past few decades the ratio of stroke is increased in these counties as compared to high income countries. Young strokes are very common nowadays with hemorrhagic type overtaking the ischemic. According to the World Health Organization, 15 million people suffer stroke worldwide each year. Of these, 5 million die and another 5 million are permanently disabled. High blood pressure contributes to more than 12.7 million strokes worldwide. In developed countries, the incidence of stroke is declining, largely due to efforts to lower blood pressure and reduce smoking. However, the overall rate of stroke remains high due to the aging of the population. Almost half of stroke-related mortality may be attributable to modifiable risk factors (i.e. hypertension, diabetes, dietary risks, impaired glucose intolerance, obesity, smoking, air pollution, alcohol use, hypercholesterolemia, and physical inactivity), which are mostly the outcome of poor clinical management, limited access to health care, and late detection of underlying risk factors[4].

Studies have shown that the Quality of life in stroke patients were decreased[5] . Even with progress in treatment approaches for stroke and its prevalence ratio, the quality of life and social-related events caused by stroke has received limited attention. Stroke is an medical emergency which puts burden on medical care services as well as personal where loss of productivity in terms of activities and quality of living is compromised. Stroke presents with both structural and functional impairments which largely affects the physical performance. Motor and cognitive impairments are common. Gait, balance, limb function, psychological issues contribute to decline in quality of work.

Variety of treatment approaches is available for management. Medicine, physiotherapy, ayurveda, homeopathy etc has its own contribution in reversing the loss and improving functional gain.

Anxiety is more important in determining health related quality of life (HQOL) than depression[6]. Even alteration in upper extremity functions adds to impaired quality of function.

Physiotherapy in Stroke:

Physiotherapy is an established field in stroke rehabilitation but uncertainties remain about the most appropriate intensity of therapy input. Stroke tends to result in a wide range of disabilities which have been shown to benefit from rehabilitation, in particular physiotherapy. Varieties of approaches are used in order to regain functional independence in trunk along with upper and lower extremities. Most of the members of the therapeutic team in stroke rehabilitation take the effectiveness of physical treatments after stroke for granted. The evidence available today suggests that it does not matter which form of treatment is chosen and that any of the available approaches will improve the patient's functional status. In other words, if an optimal treatment exists, we have, so far, failed to identify it. Until further evidence emerges, we should therefore select therapies that are most cost-effective and that can be given to the largest number of patients[7]. Physiotherapists play an inherent role in the multidisciplinary palliative care team emphasizing on improving function and quality of life in patients who are deemed to require physical and functional dimensions of care[9]. It is important to analyze the role of physiotherapy in rehabilitating stroke and understanding its importance on quality of life.

Physical therapy techniques:

Conventional exercises are traditionally practiced throughout the world. Its role in establishing upper limb control has been found to be effective. Biofeedback has been shown to have better results in both acute and chronic stroke patients along with routine exercises[8].

Exercise therapy:

Consists of passive movement, assisted movements, active movement, assisted-resisted active movements, and resisted movement. The techniques are to be applied in anatomical planes or as functional movement direction. These techniques can be performed on land or in water. The latter is termed as "hydrotherapy". Best examples of therapeutic exercise techniques are relaxation, massage, suspension therapy, muscle-re-education, progressive resisted exercise, floor aerobics, active mobility exercises, mobilization and stabilization exercise, proprioceptive neuromuscular facilitation (facilitation and inhibition techniques); breathing exercise; postural training; work simulation, work conditioning and work hardening; graded activity program and cognitive-behavioral training[10]. In recent times many neurophysiologic approaches have come up

which work exactly at the site of lesion. They work on principle of neuronal plasticity thereby having a huge impact on quality of life in stroke survivors.

Neurophysiological approaches:

Bobath concept:

Bobath concept, also known as neuro developmental treatment, is a widely used approach in the rehabilitation of hemiparetic subjects in many countries. Bobath therapy has shown to have better functional outcome[11]. It works on principles of Normal postural alignment, Inhibition versus facilitation, Assessment versus treatment.

Constrained induced movement therapy:

Original form of CIMT contains three components (1) Intensive graded practice of the paretic upper limb aimed at enhancing task-specific use of the affected limb for up to 6 hours a day for 2 weeks (i.e., shaping) (2) constraining or FU of the non-paretic upper limb with a mitt to promote the use of the more impaired limb during 90% of the waking hours; and (3) adherence-enhancing behavioral methods designed to transfer the gains obtained in the clinical setting or laboratory to the patients' real-world environment (i.e., transfer package)[13]

A total of 24 patients were randomized to constraint-induced movement therapy or Bobath Concept group. Main measures were the Motor Activity Log-28, the Wolf Motor Function Test, the Motor Evaluation Scale for Arm in Stroke Patients and the Functional Independence Measure. Constraint-induced movement therapy and the Bobath Concept have similar efficiencies in improving functional ability, speed and quality of movement in the paretic arm among stroke patients with a high level of function. Constraint-induced movement therapy seems to be slightly more efficient than the Bobath Concept in improving the amount and quality of affected arm use[12].

Proprioceptive neuromuscular facilitation:

Pelvic proprioceptive neuromuscular facilitation (PNF) helps to improve control of pelvis which is a key point for maintaining trunk control, gait and balance[14]. PNF has shown to establish significant changes in motor function and functionality after training, suggesting that this program can be useful for rehabilitation of chronic stroke survivors[15].

Motor relearning programme:

MRP works on the concept of analysis, finding the missing component, practicing it and transference of training. Task related training has shown to improve walking performance post stroke[16]. It works on concept of relearning phenomenon thereby enhancing neuronal plasticity.

Roods approach:

For every motor output proper and sequential sensory input is required. Roods approach works on this concept through sequence of primitive reflexes and milestones in order to achieve motor output. Various inhibitory and facilitatory techniques are used in order to regain motor control.

Brunstrom technique:

The predominant basis of the Brunnstrom approach is the use of reflexes to develop movement behaviour through (1) sensory stimulation to inhibit spasticity and (2) functional retraining to enhance movement control. A strong functional emphasis remains a feature of the Brunnstrom approach as a therapeutic tool for neurological dysfunction[17].

Electrotherapy:

It is a branch of physiotherapy where low, medium and high frequency currents are used to gain therapeutic effects in various disorders.

Electrical modalities:

Various electrotherapy modalities are been routinely used in treatment of impairments secondary to stroke. Reducing Pain, improving sensory input, maintaining muscular properties are the primary uses. Electrical stimulation, hot moist packs and exercises have shown to improve shoulder subluxation in stroke which is a main barrier for improving upper extremity functions[20].

Functional electrical stimulation:

Functional electrical stimulation (FES) is a treatment that applies small electrical charges to a muscle that has become paralysed or weakened, due to damage in your brain or spinal cord. Research on its use in stroke for both foot drop and to assist finger movements, was first published in the late 1970s. In the mid-1980s, a group based in Salisbury in the UK started to look at using FES. Originally their work was in people with spinal

cord injuries; from this initial work they went on to develop devices for people with MS in the early 1990s and it continues to be used today. Electrical stimulation of the nerves result in contraction of muscles supplied by them. This technique can be used to improve the muscle strength, control the movements, bowel, bladder and sexual functions, maintenance of posture, standing and walking. FES is becoming popular in the treatment of shoulder subluxation, spasticity and weakness of upper and lower limbs in hemiplegic patients.

EMG and biofeedback:

This is a technique by which subject is made aware of activity of muscles for better self regulation of the motor functions. Electromyographic biofeedback (EMG-BFB) is a technique that is believed to have additional benefit when used with standard physiotherapy for the recovery of motor function in stroke patients[18]. EMG biofeedback helps to recall anagrams using the cues. Mentally subject improves the performance by knowing the results of previous activity.

Activity of daily living training:

Individuals with stroke have difficulty in gaining functional independence in order to perform their activities of daily living. Physiotherapy works with a primary goal of achieving it. Spastic muscles make it very difficult to achieve voluntary control. Variety of interventions have been tried out and have shown to have significant impact on achieving positive results. Task-oriented training resulted in improved hand function and activities of daily living in stroke patients[19]. Therapeutic gymnasium consists of instrumental training for achieving functional mobility in upper and lower extremity. Super rider, multiple gym exerciser, wall ladder, shoulder wheel, static bicycle, parallel bar with mirror, activity of daily living training table are routinely used to improve quality of function in them.

Bladder dysfunction:

The incidence of incontinence depends on the interval between the stroke and evaluation. The reported figures are: 1st week - 60%, 6th week - 42%, and 12th week - 29%.33 The bladder dysfunction in a stroke patient may be due to inability to communicate, immobility, dementia or neurogenic bladder dysfunction[21]. Valsalva and credes maneuver are common approaches used in practice to regain control. Bladder training program can be achieved by Intermittent catheterization and timed voiding program.

Preventive complications:

Stroke, can come up with number of complications like shoulder pain, pressure sores, DVT etc. shoulder pain interferes sleep and therapy[22]. Physiotherapy should be thought of as a first-line management for patients with subacromial impingement syndrome[23]. Both exercises and electrical agents play role is reducing pain. Positioning and bed mobility exercises helps to reduce pressure sores. Aim of positioning is to prevent development of abnormal posture, spasticity and contractures. Normal anatomical alignment of head, trunk and limbs should be maintained. I125 labelled fibrinogen leg scans of patients with hemiplegia have shown evidence of DVT in 30-75% during the first week after stroke[24] . Mobilization of patient as early as possible reduces the chances of blood clot formation and risks of DVT.

Conclusion

Stroke has complex process of recovery. Stroke survivors are left with disabilities. It causes depression in patients as well as their family members. Physiotherapy has a significant role in improving impairments and disabilities. This in turn helps in improving quality of life.

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