A Study on the Functional Outcome of Lower Limb of Stroke Patient after Receiving Physiotherapy

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Abstract: *In every society, stroke is a considerable cause of death and disability which is both a preventable and a treatable disease. Fifty samples were selected by convenience sampling. Among 50 participants the mean age was 53.38 in where male 80% (n=40) and female 20% (n=10). Here male were predominantly higher than female. 70% (n=35) were ischemic and 30% (n=15) were hemorrhagic stroke.In static standing 32%, in dynamic standing 22%, in gait 26% and in stairing 14% participants were became complete independent after receiving physiotherapy. A standard questionnaire was used to collect data and outcome was measured by Functional Independent Measurement (FIM) scale. Cross sectional study design was selected for this study Data was analyzed by SPSS software version 16.0 and data was analyzed through descriptive statistics by using table, pie chart and barchart.The results of this study concluded that there was a significant improvement in functional outcome of lower limb of stroke patient after receiving physiotherapy.*

Keywords: Functional outcome, Stroke, FIM scale, Lower limb, Rehabilitation, Physiotherapy

1. Introduction

Stroke constitutes a substantial health care problem and is characterized by a high burden of disease from healthcare and public health perspectives in both worldwide and in the United States and the incidence rate of stroke is higher in African American than Caucasian (Sergeev, 2011). It is a second commonest cause of death approximately 9% (Mondal et al., 2012). Stroke is the fourth major cause of disease burden after heart disease, HIV/AIDS and unipolar depression worldwide. Stroke is associated with a significant burden of disability and loss of quality-adjusted life years (Mü¨ller-Nordhorn et al., 2006). In China, stroke has been a major public health problem (Zhang et al.,2011). Worldwide, stroke is a major cause of disability (Mondal et al., 2012). About 2.9% of the adult have had a stroke, of whom nearly a third live with a disability in American (Sergeev, 2011). In every society, stroke is a considerable cause of death and disability which is both a preventable and a treatable disease (Galvin et al., 2012). Stroke considered as a one of the principal causes of morbidity and mortality in elderly (Kelvin & Margaret, 2011) in the developed world and in all industrialized countries and it is the leading cause of disability (Belda-Loisetal., 2011). About 30% of stroke survivors are permanently disabled and require assistance to perform their activities of daily living (ADL) (Kalvin & Margaret, 2011).Stroke is the third most common cause of death and is the main cause of acquired adult disability in high-income countries (Langhorne et al., 2009). In 2005, it is reported that about 5.7 million deaths occur due to stroke, 87% occurred in low and middle income countries where 80% of the population lives in rural areas. In low and middle income countries (LMIC) approximately 85% of all stroke deaths are registered which also account for 87% of total losses due to stroke in terms of disability-adjusted life years (DALYs) calculated worldwide in 72 million per year. In Africa, the stroke mortality rate was also higher than in the United Kingdom, Canada and most other high-income countries Low and middle income countries have the largest burden of stroke accounting for more than 85% of stroke mortality worldwide (O' Donnell et al.,2010).

Stroke occurring rate is the same in men and women but women are more probable to die. Stroke, either ischemic or hemorrhagic is more common in men than in women (Zhang et al., 2011). Stroke incidence was about 30% higher in men than in women in Western Europe. Stroke is the third and fourth leading cause of death in women and men in the United States respectively (Sergeev, 2011). In 2002, stroke mortality in black men and women in the United States were 81.7 and 71.8 per 100 000 population respectively. Under the age of 65 years more than half of men and women who have a stroke die within 8 years (Gordon et al., 2004).

After ischemic heart disease stroke ranks as the second cause of death in the world population where the third only if neoplastic diseases are considered as a group. In the United States, stroke causes about one in every 18 deaths, and stroke mortality exceeds 130,000 (Sergeev, 2011). In black Africans, stroke is a significant cause of morbidity and mortality and it accounts for 2.8 - 4.5% of total deaths in the continent (Olaogun et al., 2011). In 48 European countries total number of stroke deaths is currently estimated at 1,239,000 per year.

In India, most of the patient comes at later stage and their improvements are not satisfactory. It is thought, if we can identify the specific factors, then we can give concentration on that specific factors for the better outcome of the people who are suffering from stroke; will get maximum benefits from physiotherapy treatment. The goals of physiotherapy are to provide opportunities for an individual to regain optimal skilled performance of functional actions and to increase levels of strength, endurance and physical fitness. So that this research will give ideas about the functional recovery of lower limb after taking physiotherapy and by this result we make appropriate

measures of functional improvement of affected lower limb. This study is aimed to play more attention to perform affected lower limb activity by physiotherapist and to provide important platform for physiotherapist.

2. Materials and Methods

Study design: Cross sectional study design has been adopted.

Sampling method: Simple random sampling technique was used to select study subjects.

Sample size: A total number of 50 stroke patients between the age group of ± 35 - 70 years were selected for the study. The sample consisted of 40 male patients and 10 female patients.

Setting of sampling: The study was conducted at Physiotherapy outpatient department, Govt. General Hospital, Guntur. Permission with the ethical clearance was obtained from the ethical committee of Kugler Memorial Physiotherapy Degree College, Guntur.

Study duration: Ten weeks.

Sampling criteria and Inclusion criteria
1) Age range 35 - 70years.
2) Duration of onset more than 1 month up to 1year.
3) Both ischemic and heamorrhagic stroke are included.
4) Patients who are receiving more than 20 session physiotherapy from neurology outpatient department, Govt. General Hospital, Guntur.

Exclusion criteria
1) Age range less than 35 or more than 70years.
2) Onset less than 1 month or more than 1year.
3) Any spinal deformities that affect the normal alignment of the patient.

Research tools
1) Pre participation consent form
2) Functional Independent Measurement scale (FIM).

Materials
1) Data recording sheet
2) Pen
3) Papers
4) Functional Independent Measurement scale(FIM).
5) Ruler

Functional Independent Measurement scale (FIM)
The FIM instrument refers to a scale that is used to measure one's ability to function with independence. The FIM is used worldwide in medical rehabilitation units. AFIM score is collected within 72 hours after admission to there habilitation unit. The FIM score ranges from 1 to 7 with 1 (Total Assistance) being the lowest possible score and 7 (Complete Independence) being the best possible score. Ethical clearance was obtained from the ethical committee of Kugler Memorial Physiotherapy Degree College. All subjects who fulfilled the inclusion criteria were explained about the study and a written consent was taken.

Procedure
Fifty samples were selected by convenience sampling. Among 50 participants the mean age was 53.38 in where male 80% (n=40) and female 20% (n=10). Here male were predominantly higher than female. 70% (n=35) were ischemic and 30% (n=15) were hemorrhagic stroke. Pre participation data was collected from the subjects, which included personal details. All subjects were first be given detailed information about the procedure of the study. At the initial session the subject's demographic data, Static standing balance, Dynamic standing balance, Gait and stairing score was analysed by using Functional Independent Measurement scale (FIM) and the same was assessed after 10 weeks of physiotherapy session.

Outcome measures
Before and after 10 weeks of physiotherapy session the study subjects were analyzed for what a person's capable of doing how much assistance he/she needs and what equipment have to need to perform his/her activities through Functional Independent Measurement scale (FIM).

3. Results

Among 50 participants the mean age was 53.38 in where male 80% (n=40) and female 20% (n=10). Here male were predominantly higher than female. 70% (n=35) were ischemic and 30% (n=15) were hemorrhagic stroke. Significant improvements were observed from FIM rating scale. In static standing 32%, in dynamic standing 22%, in gait 26% and in stairing 14% participants were became complete independent after receiving physiotherapy.

Table 1: Pre & Post static standing balance score of the study subjectson FIM Scale

Type of Assistance	Pre test	Post test
Total Assistance	18	0
Maximum assistance	11	0
Moderate assistance	6	4
Minimal assistance	5	11
Supervision	1	10
Modified Independent	7	11
Complete independent	2	16

Results of the above table show that during pre test 18 (36%) need total assistance, 11 (22%) need maximum assistance, 6 (12%) need moderate assistance, 5 (10%) need minimal assistance and 7 (14%) are modified independent on standing balance. Post test results show that 16 (32%) are completely independent, 11 (22%) are modified independent, 11 (22%) required minimal assistance and 10 (20%) need supervision on standing balance. The study results show that there was a significant improvement in dependency of the study subjects on static standing balance score after receiving physiotherapy according to the functional independence measure (FIM).

Table 2: Pre & Post dynamic standing balance score of the study subjects on FIM Scale

Type of Assistance	Pre test	Post test
Total Assistance	30	0
Maximum assistance	6	4
Moderate assistance	4	11
Minimal assistance	0	8
Supervision	6	10
Modified Independent	3	6
Complete independent	1	11

Results of the above table show that during pre test most of them 30 (60%) need total assistance, 6 (12%) need maximum assistance and 6 (12%) need only supervision. Post test results show that most of them 11 (22%) are completely independent, 6 (12%) are modified independent, 11 (22%) need moderate assistance and 10 (20%) need only supervision after receiving physiotherapy. The study results show that there was a significant improvement in dependency of the study subjects on dynamic standing balance score after receiving physiotherapy according to the functional independence measure (FIM).

Table 3: Pre & Post Gait score of the study subjects on FIM Scale

	Pre test	Post test
Total Assistance	33	9
Maximum assistance	1	0
Moderate assistance	2	6
Minimal Assistance	5	6
Supervision	6	7
Modified Independent	3	9
Complete independent	0	13

Results of the above table show that during pre test most of them 33 (66%) need total assistance, 6 (12%) need supervision and 5 (10%) need minimal assistance. Post test results show that most of them 13 (26%) became completely independent, 9 (18%) required modified assistance and 9 (18%) need total assistance after receiving physiotherapy. The study results show that there was a significant improvement in dependency of the study subjects on gait score after receiving physiotherapy according to the functional independence measure(FIM).

Table 4: Pre & Post Stairing score of the study subjects on FIM Scale

Type of Assistance	Pre test	Post test
Total Assistance	35	18
Maximum assistance	3	1
Moderate assistance	3	6
Minimal assistance	3	6
Supervision	5	6
Modified Independent	1	6
Complete independent	0	7

Results of the above table show that during pre test most of them 35 (70%) are in need of total assistance, 5 (10%) need supervision. Post test results show that all most 18 (36%) are in need of total assistance and 7 (14%) were completely independent after receiving physiotherapy. The study results show that there was a significant improvement in dependency of the study subjects on stairing score after receiving physiotherapy according to the functional

independence measure (FIM).

4. Discussion

In this study, among 50 participants, initial score of static standing balance on FIM scale was mean 2.78 with SD 1.94 were 36% participants score was 1 that means need total assist, 22% need maximum assist FIM score was 2, 12% participants need moderate assist FIM score was 3, 10% need minimal assist FIM score was 4, 2% need supervision FIM score was 5, 14% were modified independent and FIM score was 6. 4% were complete independent and score of initial dynamic standing balance on FIM scale was mean 2.18 with SD 1.80 were 60% participants score was 1 that means need total assist, 12% need maximum assist FIM score was 2, 8% participants need moderate assist FIM score was 3, 12% need supervision FIM score was 5, 6% were modified independent and FIM score was 6, 2% were complete independent and it was supported by study of Lin et al., 1999 where the initial FIM score of standing balance was 55.2 with SD23.

In this study among 50 participants post study, static standing balance on FIM scale after receiving physiotherapy was mean 5.56 with SD 1.26 were 4% participants need moderate assist that means FIM score was 3,22% need minimal assist FIM score was 4,20% need supervision FIM score was 5,32% were modified independent and FIM score was 6. 22% were complete independent and score of dynamic standing balance on FIM scale after receiving physiotherapy was mean 4.72 with SD 1.65 were, 8% need maximum assistance that means FIM score was 2, 22% participants need moderate assist FIM score was 3, 16% need minimal assist FIM score was 4, 20% need supervision FIM score was 5, 12% were modified independent and FIM score was 6. 22% were complete independent and it was supported by study of Lin et al., 1999 where the post test FIM score of standing balance was 72.2 with SD 27.2.

In this study participant's initial FIM score of dynamic standing balance most of them 30 (60%) need total assistance, 6 (12%) need maximum assistance and 6 (12%) need only supervision. Post test results show that most of them 11(22%) are completely independent, 6 (12%) are modified independent, 11 (22%) need moderate assistance and 10 (20%) need only supervision after receiving physiotherapy. The study results show that there was a significant improvement in dependency of the study subjects on dynamic standing balance score after receiving physiotherapy according to the functional independence measure (FIM) and it was supported by the study results of Walker et al., 2000 and Hill et al.,1997.

In this study, 66% participant's initial FIM score of gait was 1 that means need total assist, 2% need maximum assist FIM score was 2, 4% participants need moderate assist FIM score was 3, 10% need minimal assist FIM score was 4, 12% need supervision FIM score was 5, 6% were modified independent and FIM score was 6 and the above results was supported by results of the study by Lin et al., 1999 & Hill et al., 1997 where the study result showed that, 41.3% participants initial score on FIM was 1, 13.8%

score on FIM was 2, 6.4% participants FIM score was 3, 18.3% participants FIM score was 5, 1.8% participants FIM score was 6, 4.6% participants FIM score was7.

In this study post test, 26% participants FIM score of gait was 1 that means need total assist,12% need moderate assist FIM score was3,12% participants need minimal assist FIM score was 4, 14% need supervision FIM score was 5, 18% were modified independent FIM score was 6, 26% participants become completely independent where FIM score was 7 after receiving physiotherapy and the above was supported by the results of a study of Hill et al., 1997 where the results show 4.8% participants FIM score of gait was 1 that means need total assist, 2.9% need maximal assist FIM score was 2, 1.9% were need moderate assist FIM score was 3, 7.6% participants need supervision FIM score was 5, 43.8% were modified independent FIM score was 6, 35.2% participants become completely independent where FIM score was 7 after receiving physiotherapy.

In this study, out of 50 participants, 70% participants initial FIM score of stairing was 1 that means need total assist, 6% need maximum assist FIM score was 2, 6% participants need moderate assist FIM score was 3, 6% need minimal assist FIM score was 4, 10% need supervision FIM score was 5, 2% participants were independent and FIM score was 6 and it was supported by the study of Hill et al., 1997 where the results showed 60.5% participants initial FIM score of stairing was 1 that means need total assist, 4.6% need maximum assist FIM score was 2, 9.2% participants need moderate assist FIM score was 3, 15.6% need minimal assist FIM score was 4, 6.4% need supervision FIM score was 5, 3.7% participants were modified independent and FIM score was 6 and 0.0% participants were independent FIM score was 7.

In this study among 50 participants in Post test, 36% participants FIM score of stairing was 1 that means need total assist, 2% need maximum assist FIM score was 2, 12% participants need moderate assist FIM score was 3, 12% need minimal assist FIM score was 4, 12% need supervision FIM score was 5, 12% participants were modified independent and FIM score was 6, 14% participants were became independent and FIM score was 7 after receiving physiotherapy and it was supported by the results of a study by Hill et al., 1997 where 19.2% participants initial FIM score of stairing was 1 that means need total assist, 2.9% need maximum assist FIM score was 2, 2.9% participants need moderate assist FIM score was 3, 4.8% need minimal assist FIM score was 4, 16.4% need supervision FIM score was 5, 39.4% participants were modified independent and FIM score was 6 and 14.4% participants were independent FIM score was after receiving physiotherapy. Thus these results support the hypothesis for this study, with the exception of the lack of stairing ability after Physiotherapy session.

5. Conclusion

The results of this study concluded that there was a significant improvement in functional outcome of lower limb of stroke patient after receiving physiotherapy.

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