

## To assess the outcome of Intensive Physiotherapy given in Early Stage of Stroke

Khushbu D. Gajjar\*

Shrimad Rajchandra College of Physiotherapy, Maliba Campus, Bardoli, Surat, India.

**Correspondence Address:** \* Khushbu D. Gajjar, Shrimad Rajchandra College of Physiotherapy, Maliba Campus, Bardoli, Surat, India.

### Abstract

**Introduction:** Stroke associated with psychological as well as Sociological burden. Most recovery occurs in the first 30 days but that improvement may continue as long as 6 to 12 months after stroke. Early rehabilitation helps the patient to adapt new life and regain as much independence as possible, to reduce the disabilities and enable the patient to return to community.

**Materials and methods:** 20 In-patients of first acute stroke were randomly allocated in to Experimental and Control group. Each treatment regimen was applied for 30 - 40 min, 7 days a week during the first week after stroke. The main outcome measures were HSS and BBS.

**Results:** At 7<sup>th</sup> day, the experimental group had higher scores than the control group for HSS motor and BBS.

**Discussion:** HSS Motor function for the experimental group was  $-10.100 \pm 3.479$ , control group  $-7.400 \pm 4.526$ . ( $p < 0.005$ ). Experimental group has improved in BBS score with  $14.500 \pm 6.005$  ( $p = 0.0001$ )

**Conclusion:** Earlier and intensive mobilization in the acute phase of stroke can accelerate recovery of motor performance and functional independence. All subjects, the total score of HSS and BBS was improved from day 1 to day 7.

**Interpretation:** Greater intensity of rehabilitation improves balance and functional recovery, providing further evidence that exercise therapy primarily induces treatment effects on the abilities at which intensive training is specially directed.

**Keywords:** Intensive Physiotherapy, Acute stage, Stroke, Hemiplegia, HSS, BBS

### Introduction

WHO Defines stroke as “rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin”<sup>1</sup>. The prevalence of stroke in India varies in different regions of the country

and, ranges from 40 to 270 per 100 000 population. The ICMR study on Burden of Disease (2005) estimated that there has been an increase in the number of stroke cases in India during the last one and a half decades by 17.5 %. Many studies<sup>2-6</sup> associate stroke care with psychological burden. A similar scenario is expected in India<sup>8</sup> because of

increasing stroke incidence and minimal social support.

The results of studies on motor recovery in stroke shows that most recovery occurs in the first 30 days but that improvement may continue as long as 6 to 12 months after stroke<sup>8</sup>.

Fifty percent of stroke survivors will experience some residual impairment (physical and cognitive), which is devastating to the individual and their families. Most stroke survivors recover to some degree; many survivors are left with significant sensori-motor and cognitive deficits<sup>9</sup>. These deficits produce long-term need for assistance from care givers and society.

Stroke rehabilitation consists of different physical or cognitive exercises that help stroke patients strengthen neurological functions and recover from neurological deficits by promoting natural recovery, preventing complications due to disabilities and adapting to disabilities<sup>10</sup>. The recovery from stroke is often slow and incomplete, leading to partial or complete loss of locomotion, activities of daily living (ADL), cognition and communication skills<sup>10</sup>.

Early mobilization represents a simple, easy-to-deliver intervention, requiring little or no equipment. It is potentially deliverable to 85% of the acute stroke population<sup>11</sup>. Early mobilization helps prevent complications e.g. DVT, skin breakdown contracture and pneumonia. Evidence has shown better orthostatic tolerance<sup>19</sup> and earlier ambulation<sup>12</sup>.

Early intervention is beneficial in patients with stroke, which also reduces the length of hospitalisation, hence reduces the burden on family member who received early rehabilitation<sup>13-16</sup>.

A controlled study of stroke rehabilitation, found that the degree of improvement correlated strongly with the amount of intensity of therapy<sup>17</sup>. Another study where the patients treated intensively with physiotherapy twice per day showed

significantly better functional recovery<sup>18</sup>. Evidence to support specific physiotherapy interventions in the first few weeks after stroke is limited<sup>19</sup>. So, it is important to see the effect of early intensive physiotherapy treatment in patients with acute hemiplegia.

## Materials and methods

**Study design:** Prospective, interventional study, Randomized control trial.

20 consecutive patients admitted to Hospital diagnosed as stroke and referred for Physiotherapy were randomly allocated to an experimental group or the control group after satisfactory fulfilling the inclusion and exclusion criteria. The groups were assessed on day 1 as per the neurological examination and following outcomes/scales were measured; HSS and BBS.

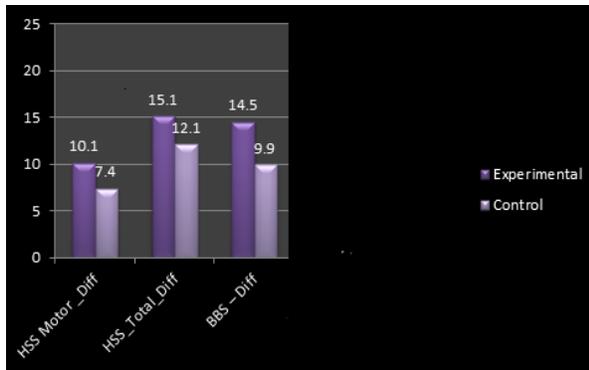
A structured, custom-made physiotherapy program was planned and implemented for both the groups; however as per the deficits that arises from the assessment, depending on patient's condition, minor alteration in the treatment was undertaken if necessary.

Group A were received intensive physiotherapy i.e. Physiotherapy treatment three times in a day (Experimental group). Group B were received physiotherapy only once in a day (Control group). Physiotherapy treatment was executed from day 1 to day 7 for both the groups. At the end of study the subjects were reassessed for neurological examination as well as for outcomes/scales to note the changes.

## Results

- 1) Both the group showed improvement in HSS Motor score from day 1 to day 7, Control group from  $33.50 \pm 7.531$  to  $26.10 \pm 8.812$  Experimental group from  $33.40 \pm 5.502$  to  $23.30 \pm 7$ . On paired t test both the group showed statistically significant with difference in Control group  $-7.400 \pm 4.526$  and Experimental group  $-10.100 \pm 3.479$  and ( $p < 0.005$ ).
- 2) Both the group showed improvement in BBS Score from day 1 to day 7, Control

group from  $7.40 \pm 10.762$  to  $17.30 \pm 12.720$  and experimental group from  $6.10 \pm 4.433$  to  $20.60 \pm 9.454$ . On paired t test both the groups showed statistically significant. ( $p < 0.005$ ).



### Difference between both the group on HSS motor function and BBS

#### Discussion

In the post-acute rehabilitation phase, more therapy accounts for better outcomes<sup>20, 21</sup>. Although many guidelines recommend starting early mobilization, they do not specify how soon after onset or how much therapy is best, largely because the supporting evidence to guide recommendations is insufficient<sup>22-24</sup>.

Emphasizing outcomes management in clinical practice has increased the importance of quantitative evaluation using assessment scales. It is important to use neurological deficit scales that can accurately predict disability, to ensure adequate follow – up, and which can be used by all healthcare professionals. Such scales should be easily and quickly administered, responsive, valid and reliable. With all these positive factors as well as due to relative large amount of neurologic information obtained, the HSS used to measure strokes in a variety of vascular territories. It is a reliable scale to assess the acute motor function as well as other neurological deficits in stroke patients<sup>25</sup>. Langhorne et al stated that More intensive physiotherapy in acute stroke was associated with a reduction in the deterioration of the deficits and

enhance the rate of recovery along with improve functional status following stroke in acute stage<sup>26</sup>. Feyset al showed that an early repetitive rehabilitation during the acute phase after a stroke resulted in a clinically meaningful and long-lasting effect on motor function in patients, even after 5 years<sup>27</sup>.

Accurate evaluation of balance is important for prescribing appropriate mobility aids, determining the most effective treatment interventions, and identifying safe and unsafe activities after stroke. The BBS was identified as the most commonly used assessment tool across the continuum from acute care to community-based care<sup>28</sup>.

A study done by Juhanisivenius et al stated that the Functional recovery of stroke, which was assessed with ADL and motor function showed intensive therapy had significantly better outcome in achieving functional independence for rehabilitation care following an acute stroke<sup>29</sup>.

So far, little is known about the intensive therapy provided for stroke patients in acute care rehabilitation. The study aimed to deliver a higher intensity of exercises in experimental group. If therapy delivered to an intervention group does not differ from that delivered to controls, then “no effect” will be the finding but from the outcome measure it suggest that early and intensive Therapy has shown more improvement in experimental group.

#### Acknowledgements

I wish to dedicate my work to almighty God, to my beloved parents, to all my family members and well-wishers without whose blessing and grace I could not have reached this stage in my life. I acknowledge the intellectual contribution of Dr. G P Kumar, My Guide and Prof. Lata D. Parmar in constructing this study & would like to register my special thanks to her. I thank the Human Research Ethical Committee H M Patel Centre for Medical Care and Education, Karamsad, who guided and

granted me permission to conduct this dissertation. I specially thank the head of Medicine dept., Shree Krishna Hospital, Karamsad who allowed me to examine and work on patients admitted for acute stroke. I specially thank Dr. Soham Desai for his invaluable guidance. A special thanks to Mr. Ajay Phatak and Madam Jaishree who helped me complete the statistical calculation of my study. And finally I wish to wholeheartedly thank all those subjects who participated in this study who trusted me and allowed me to work with them.

### References

1. WHO definition of stroke, 2012
2. Anderson CS, Linto J, Stewart-Wynne EG. A population-based assessment of the impact and burden of caregiving for long-term stroke survivors. *Stroke*. 1995; 26: 843–849.
3. Schulz R, Tompkins CA, Rau MT. A longitudinal study of the psychosocial impact of stroke on primary support persons. *Psychol Aging*. 1988; 3: 131-41
4. Suh M, Kim K, Caregiver's burden, depression and support as predictors of post-stroke depression: a cross-sectional survey. *Int J Nurs Stud*. 2005; 42: 611-18.
5. Yeung S, Lui MH, Ross F, Murrells T. Family carers in stroke care: examining the relationship between problem-solving, depression and general health. *J ClinNurs*. 2007; 16: 344–352.
6. Morimoto T, Schreiner AS, Asano H. Caregiver burden and health-related quality of life among Japanese stroke caregivers. *Age Ageing*. 2003; 32: 218-23.
7. Das SK, Banerjee TK, Biswas A, Roy T, Raut DK, Mukherjee CS, Chaudhuri A, Hazra A, Roy J. A prospective community-based study of stroke in Kolkata, India. *Stroke*. 2007; 38: 906–910.
8. Motor Recovery In Stroke. Author: Auri Bruno-Petrina, MD, PhD, Clinical Trainee, Pemberton Marine Medical Clinic, N Vancouver
9. Mcclean et al, Medical complication experienced by a cohort of stroke survivor during inpatient, *arch of phy med and rehab* 2004; 85: 466-469.
10. K.P.S. Nair, *Neurology India*, Stroke Rehabilitation: Traditional and Modern Approaches Vol. 50, (Suppl. 1), Dec, 2002, pp. S85-S93.
11. Asberg et al, therapy impact on functional recovery in stroke recovery, 1989, 85: 377-391
12. Hayes and Carroll, Early intervention care in the acute stroke patient. *Arch Phys Med Rehabil*. 1986 May;67(5):319-21
13. Garraway WM, Akhtar AJ, Prescott RJ, Hockey L: Management of acute stroke in the elderly: preliminary results of a controlled trial. *Br Med J* 280: 1040-1043, 1980
14. Garraway WM, Akhtar AJ, Smith DL, Smith ME: The triage of stroke rehabilitation. *J Epidemiol Community Health* 35: 39-44, 1981
15. Prescott RJ, Garraway WM, Akhtar AJ: Predicting functional outcome following acute stroke using a standard clinical examination. *Stroke* 13: 641-647, 1982
16. Smith ME, Garraway WM, Smith DL, Akhtar AJ: Therapy impact on functional outcome in a controlled trial of stroke rehabilitation. *Arch Phys Med Rehabil* 63: 21-24, 1982
17. Bobath, adult hemiplegia, 1990.
18. Sivenius J, Pyorala K, Heinonen OP, Salonen J, Riekkinen P: The significance of intensity of rehabilitation of stroke: A controlled trial. *Stroke* 1985;16:928-931
19. Bernhardt J. Very early mobilization following acute stroke: Controversies, the unknowns, and a way forward. *Ann Indian Acad Neurol* 2008;11:88-98
20. Langhorne P, Wagenaar R, Partridge C. Academic Section of Geriatric Medicine, Royal Infirmary, Glasgow, UK. 1996;1(2):75-88.

21. Kwakkel G et al, Wagenaar RC, Koelman TW, Lankhorst GJ, Koetsier JC. Effects of intensity of rehabilitation after stroke, A research synthesis. *Stroke*. 1997;28:1550-1556.
22. Adams HP Jr, Adams RJ, Brott T, et al. Guidelines for the early management of patients with ischemic stroke: a scientific statement from the stroke council of the American Stroke Association. *Stroke*. 2003;34:1056-1083.
23. National Stroke Foundation. *Clinical Guidelines for Stroke Management*. Melbourne, Australia: National Stroke Foundation, 2010.
24. European Stroke Initiative recommendations for stroke management update 2003. *Cerebrovasc Dis*. 2003;16:311-337
25. Adams RJ, Meador KJ, Sethi KD, Grotta JC, Thomson DS. "Graded neurologic scale for use in acute hemispheric stroke treatment protocols." *Stroke*. 1987;18:665-9
26. Langhorne P, Wagenaar R, Partridge C. Physiotherapy after stroke: more is better? *Physiother Res Int*. 1996;1(2):75-88.
27. Feys H et al. Early and repetitive stimulation of the arm can substantially improve the long-term outcome afterstroke: a 5-year follow-up study of a randomized trial, *Stroke*. 2004 Apr;35(4):924-9.
28. Korner-Bitensky N, Wood-Dauphine SL, Teasell R, et al. Best versus actual practices in stroke rehabilitation: results of the Canadian National Survey [abstract]. *Stroke*. 2006;37:631.
29. Juhanisivenius et al, a randomised controlled trial of the significance of intensity of rehabilitation of stroke - a controlled trial *apta j of stroke* vol 16, no 6, 1985.