

Evaluation of Daily Life Activities (Functional Outcomes) in Ischemic Stroke Patients With and Without Diabetes

Syed Naeemullah¹, Ihsanullah² and Nazia Khan³

ABSTRACT

Objective: To evaluate and compare the functional outcomes and daily life activities in ischemic stroke patients with and without diabetes.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted in the Department of Neurology, Shaikh Zayed Postgraduate Medical Complex, Lahore from May 2013 to May 2014.

Materials and Methods: This study was comprised 100 patients, and used Barthel Index Scoring System for measuring daily life activities in our stroke patients on admission, one month and 3 months after stroke event.

Results: The lower Barthel index on admission and slower recovery during first 4 weeks in diabetic patients than non-diabetics while no significant differences were noted after 3 months of stroke onset between both groups.

Conclusion: Functional outcomes of activities of daily life in diabetic stroke patients are slower than non-diabetics in first month after onset of stroke.

Key Words: Functional outcome, Ischemic stroke, Diabetes

Citation of article: Naeemullah S, Ihsanullah, Khan N. Evaluation of Daily Life Activities (Functional Outcomes) in Ischemic Stroke Patients with and Without Diabetes. Med Forum 2016;27(12):6-8.

INTRODUCTION

Ischemic stroke occurs with loss of brain functions due to a disturbance or impairment in its blood supply.¹ Ischemic stroke occurs from occlusion of a major artery in the human brain and accounts for more than 80% of all strokes.²

Since normal brain cell functions depend upon a level of perfusion that provides optimal delivery of nutrients.³ Therefore when blood supply to the brain is interrupted, the cells are receiving insufficient amount of glucose and oxygen which are essential for their vital functions.⁴ Maintaining control of blood glucose level is essential for decreasing its associated long and short term complications and achieving a best quality of life.⁵ Barthel index is used to measure and evaluate functions of a patient's activities of daily life (ADL) with a higher scoring denoted independence in ADL and the lowest score is for dependency on others.⁶ Barthel index has 10 items as feeding, bathing, grooming, dressing, bowel and bladder control, toileting, chair transfer, ambulation and stair climbing.⁷

Shah et al⁸ had reported that 0-20 points shows "total" dependency, 21-60 points are for "severe" dependency, 61-90 points "moderate" dependency, and 91-99 points are labelled as "slight" dependency.

¹. Department of Neurology / Hematology (ABTO)² / Community Medicine³, Shaikh Zayed Hospital Lahore.

Correspondence: Dr. Syed Naeemullah, Senior Registrar, Department of Neurology, Shaikh Zayed Hospital Lahore.
Contact No: 0300-5748676
Email: sdnaeem@hotmail.com

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Neurology Shaikh Zayed Postgraduate Medical Complex, Lahore from May 2013 to May 2014, and used Barthel Index Scoring System for measuring daily life activities in our stroke patients on admission, during hospital stay, one month and 3 months after stroke event. One hundred ischemic stroke patients were included and they were divided in two groups; group "A" (diabetic) and group "B" (non-diabetic) with 50 patients in each group. Patients of both groups were sub divided into 5 subgroups with the range of 20 points of Barthel index as follow: (Total 100 points score) 0-20, 21-40, 41-60, 61-80 and 81-100. The dependency status was categorized as total, severe, moderate, minimal and independent. Data was entered in computer software SPSS version 20

RESULTS

The lower Barthel index on admission and slower recovery during first month in diabetic patients than non-diabetics while no significant differences were noted after 3 months of stroke onset between both groups. Most of the patients in both groups had difficulties in bathing, toileting, bowel control, climbing stairs and grooming during first month of stroke event while bathing, climbing stairs were still difficult tasks for patients in first three months after stroke (Table 1, 2).

Table No.1: Barthel Index of patients on admission, 1 month and 3 months after stroke onset

Barthel index	No. of patients in diabetic group			No. of patients in non-diabetic group		
	Admission	Follow-up		Admission	Follow-up	
		1 month	3 months		1 month	3 months
0 – 20	44	12	-	37	4	-
21 – 40	4	20	6	9	17	3
41 – 60	2	16	35	4	21	36
61 – 80	-	2	8	-	8	9
81 – 100	-	-	1	-	-	2

Table No.2: Dependency status of patients according to their Barthel index scores on admission, 1 month and 3 months after stroke onset

Barthel index	No. of patients in diabetic group			No. of patients in non-diabetic group		
	Admission	Follow-up		Admission	Follow-up	
		1 month	3 months		1 month	3 months
0 – 20 Total dependency	44	12	-	37	4	-
21 – 60 Severe dependency	6	36	41	13	38	39
61 – 90 Moderate dependency	-	2	9	-	8	11
91 – 99 Minimal/Mild dependency	-	-	-	-	-	-
100 Independent	-	-	-	-	-	-

DISCUSSION

In our study 44% vs 37% patients were admitted with total dependency in diabetic and non-diabetic groups respectively. There were 6% patients in diabetic and 13% in non-diabetic group admitted with severe dependency status according to Barthel index score of patients. In moderate, mild dependency and total independence status no one was admitted in both groups. One month post stroke event there were 12% vs 4% patients with total dependency, 36% vs 38% with severe dependency, 2% vs 8% with moderate dependency and 0% vs 0% were with mild dependency in group "A" and "B" respectively. After three months follow up there was 0% vs 0% with total dependency status while 41% vs 39% patients with severe dependency status were noted in diabetic and non-diabetic groups respectively. Total 9% diabetic patients and 11% non-diabetic patients were noted with moderate and 0% vs 0% with minimal dependency status. There was no patient who performed independently in both groups after three months of stroke onset. In this study the minimum stay of stroke patients in hospital was one week and maximum was about two weeks. First follow up after discharge from hospital was done after two weeks of all patients. Our study shows that most of the patients from diabetic group had lower Barthel index scoring compared with non-diabetic group on admission till first 3-4 weeks after stroke event. Patients from both groups had difficulties in bathing, grooming, feeding, dressing, bowel and bladder control, shifting from bed/wheelchair, use of stairs up and down as well as toilet use in first two weeks after stroke event. Diabetic patients had lower Barthel index during admission and also showed slow improvement in ADL during hospital stay compared with non diabetic group.

A study shows that diabetic patients had higher death rates, dependencies and recurrent stroke events compared with non-diabetics at 3 and 6 months after stroke onset with poor and bad outcomes after ischemic stroke.⁹

It was noted in our study that there was no significant difference in Barthel index scoring in both groups after first three months of stroke event. After three months follow up most of the patients in both groups had difficulties in bathing, use of stairs up or down. There was improvement of barthel scoring in feeding, dressing, indoor mobility, and wheel chair to bed transfer as well as bladder control in stroke patients of both groups. In our study it was observed that patients of both groups had impaired bowel habits with increasing frequency of constipation but bowel controlling was satisfactory.

Stroke patients are dependent on others for daily life activities and stroke related disability is present worldwide in many diverse populations including US, Europe, Africa and Asian population.¹⁰⁻¹² Overall, 15 to 30% of these cases become permanently disabled and death results in 23% of the cases.¹³

Reduced Disability Adjusted Life Years (RDALY) criteria put stroke events as the 3rd highest disability cause in 2010. Older people are more prone to stroke and the risk increases by the age over 65 years.¹⁴

From half to two third of patients who survive a stroke are regaining independence and up to 80% of these patients regain or retain the ability to walk.¹⁵

A study shows 18% case fatality in non-diabetic and 16% in diabetic stroke patients. This study describes Barthel index of 50 to 90 of non-diabetics and 45 to 75 of diabetics who were discharged alive from the hospital. A 4 fold increased fatality were documented in admission hyperglycemia patients than admission normoglycemics.¹⁶

Amr kamel et.al¹⁷ has documented that diabetics had worsen Canadian scale and non significant changes in Barthel index ADL compared with non-diabetics. According to this study bathing steps of ADL were found to be very difficult to score above 12 after one month of stroke follow up.

Sujatha et al¹⁸ has documented increase of Barthel index scoring at the time of discharge compared with scoring of ischemic stroke patients on admission. This increase of Barthel index was 52.27 vs 56 indicate a significant increase in scoring points at the time of discharge from hospital compared with scoring on admission.

Poletto et.al¹⁹ compared early mobilisation and routine physiotherapy of stroke patients shows no significant difference in Barthel Index scoring at about 3 months post stroke in both groups. According to this study the scoring points of both groups were ≥ 85 on Barthel Index.

A study by Nakao et al²⁰ describes good outcomes in 6 months of stroke patients having early 3 weeks with BI score of more than 40 compared with those of less than 40 score in early 3 weeks of stroke onset.

According to Lee et al²¹ there was a comparatively rapid recovery of patients during first month of post stroke compared with recovery after 3 to 6 months of the stroke.

CONCLUSION

Our limited study data shows that functional outcomes of activities of daily life in diabetic stroke patients are slower than non-diabetics in first 3-4 weeks after onset of stroke while no significant differences were noted in 3 months of follow-up after stroke. It also shows that diabetic patients have lower Barthel index compared with non-diabetics on admission.

Conflict of Interest: The study had no conflict of interest to declare by any author.

REFERENCES

1. Sims NR, Muyderman H. Mitochondria, oxidative metabolism and cell death in stroke. *Biochimica et Biophysica Acta* 2009;1802:80-91.
2. Flynn RWV, MacWalter RSM, Doney ASF. The cost of cerebral Ischemia. *Neuro Pharmacol* 2008; 55:250-56.
3. Faraci FM. Protecting against vascular disease in brain. *AJP Heart* 2011;300:1566-82.
4. Hickey. The clinical practice of neurological and neurosurgical nursing, 5th ed. Philadelphia: Lippincott Williams & Wilkins.
5. Chau JP, Chung LC, Wong RY, Loo KM, Lo SH, So TT. An evaluation of a web based diabetes education program designed to enhance self-management among patients living with diabetes. *Comput Inform Nurs* 2012;30:672-9.

6. O'Sullivan, Susan B; Schmitz, Thomas J. Physical rehabilitation. 5th ed. Philadelphia: PA FA Davis Company;2007.p.385.
7. Marvin K. Lisa Z. Assessments activities of daily living (ADL). In: McDermott A, Korner-Bitensky N, Sitcoff E, editors. Barthel Index (BI). Philadelphia: Saunders; 2015.
8. Shah S, Vanclay F, Cooper B. Improving the sensitivity of the Barthel Index for stroke rehabilitation. *J Clin Epidemiol* 1989;42: 703-9.
9. Qian J, Xingquan Z, Chunxue W, Yilong W, Yu Y, Hao L et al. Diabetes and poor outcomes within 6 months after acute ischemic stroke, the China National Stroke Registry. *Stroke* 2011;42:2758-62.
10. Towfighi A, Saver JL. Stroke declines from third to fourth leading cause of death in the United States: historical perspective and challenges ahead. *Stroke* 2011;42:2351-5.
11. Kinlay S. Changes in stroke epidemiology, prevention, and treatment. *Circulation* 2011;124: 494-96.
12. Kim AS, Johnston SC. Global variation in the relative burden of stroke and ischemic heart disease. *Circulation* 2011;124:314-23.
13. Saad M, Ali Z, Gureghia IA. Risk factors for stroke. *JIMA* 2001; 33:68-71.
14. Sevelick RC, Rossi PW, Dougherty K. Living with stroke: a guide for families. Chicago: Contemporary Books, 1994.
15. Yaggi HK, Concato J, Kernan WN, Lichtman JH, Brass LM, Mohsenin V. Obstructive sleep apnea as a risk factor for stroke and death. *N Engl J Med* 2005; 353(19): 2034-41.
16. Stollberger C, Exner I, Finsterer J, Slany J, Steger C. Stroke in diabetic and non-diabetic patients: Course and prognostic value of admission serum glucose. *Ann Med* 2005;37: 357-64.
17. Kamel A, Azim HA, Aziz SA, Ghaffar A, El-Okeely A. Cerebral Infarction in diabetes mellitus: a comparative study of diabetic and non-diabetic ischemic stroke. *Egypt J Neurol Psychiat. Neurosurg* 2006, 43(1): 167-77.
18. Sujatha SM, Ramalingam A, Radhakrishnan V, et al. Acute stroke: functional outcome predictors. *J Evolution Med Dent Sci* 2016;5(23): 1213-7.
19. Poletto SR, Rebello LC, Valença MJM, Rossato D, Almeida AG, Brondani R, et al. Early mobilization in ischemic stroke: a pilot randomized trial of safety and feasibility in a public hospital in Brazil. *Cerebrovasc Dis Extra* 2015;5:31-40.
20. Nakao S, Takata S, Uemura H, Michiharu-kashihara, Osawa T, Komatsu K, et al. Relationship between Barthel Index Scores during the acute phase of rehabilitation and subsequent ADL in stroke patients. *J Med Invest* 2010;57:81-8.
21. Lee KB; Lim SH, Kim KH, Kim JK, Kim YR, Chang WN, et al. Six-month functional recovery of stroke patients: a multi-time-point study. *Int J Rehab Res* 2015; 38(2): 173-80.