

Rehabilitation Outcomes in Stroke: An Observational Study

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ABSTRACT

Background: Stroke is the sudden occurrence of permanent damage to an area of the brain caused by a blocked blood vessel or bleeding within the brain.

Aim and objective: To assess the outcome of rehabilitation in stroke survivors in various parameters at regular intervals.

Materials and methods: This prospective randomized control study was performed in a tertiary-care teaching institution of North India. One hundred patients fulfilling World Health Organization criteria for stroke were selected for this study. Subjects were assessed by computed tomography scan findings and Barthel index at time of admission and follow-up.

Results: Better recovery pattern was found in hemorrhagic patients (24) rather than ischemic patients (76) and in right-side lesion when compared to left side.

Keywords: Function, Rehabilitation, Stroke.

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INTRODUCTION

Stroke has been recognized since antiquity as a major cause of disability today. A stroke is the sudden occurrence of permanent damage to an area of the brain caused by a blocked blood vessel or bleeding within the brain. Other causes of focal brain damage, such as traumatic brain injury, demyelinating lesions, brain tumors, brain abscesses, and others, can produce stroke-like symptoms but are not included in this definition. Strokes can be divided into two major categories: ischemic, generally caused by a vascular occlusion, and hemorrhagic, caused by bleeding within the parenchyma of the brain. Some classify nonparenchymal hemorrhage, such as subarachnoid hemorrhage (SAH), due to a ruptured intracranial aneurysm as a form of hemorrhagic stroke as well. A significant number of people who sustain a stroke do not reach medical attention due to a lack of symptoms or the failure to recognize the symptoms as requiring medical attention. (It is estimated that 28% of individuals aged 70–74 have had a silent cerebral infarction).¹ The most common symptom of stroke is focal weakness, although stroke can produce a wide range of symptoms, such as sensory loss, speech and language disturbance, visual loss, etc. The resultant neurological deficits are generally referred to as impairments, which may or may not result in functional limitations often characterized as disability. The objectives of stroke rehabilitation are to achieve a maximum level of functional independence; facilitate neurological recovery; minimize disability; successfully reintegration back into home, family, and community; and establish a meaningful and gratifying life. Education of the stroke survivor and his or her family is of utmost importance regarding secondary stroke prevention, including risk factor modification. These goals are accomplished through various treatments to facilitate recovery and reduce impairments; functional training to compensate for residual impairments; and use of assistive devices, such as braces or wheelchair to substitute for lost function. Successful rehabilitation also requires management of the many psychosocial issues that surround integration of the patient back to home and community.

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MATERIALS AND METHODS

All patients admitted to All India Institute of Medical Sciences, Patna, with diagnosis of nontraumatic and non-neoplastic cerebrovascular accidents were evaluated. A total of 100 patients were selected for this study. Cases fulfilling World Health Organization (WHO) criteria for stroke, i.e., rapidly developing clinical signs of focal (global) disturbances of cerebral function lasting >24 hours were included. Patients with hemorrhage secondary to trauma, brain tumor, central nervous system infection, recurrent stroke, predominant subarachnoid hemorrhage, patients receiving anticoagulant therapy were excluded from the study. The base parameter in relation to study like age, sex, vascular risk factor (hypertension or diabetes mellitus), initial level of consciousness (normal/drowsy/comatose) limbs paresis, oral comprehension and expression, occupation socioeconomic status, and habitat (rural/suburban/urban) were recorded. Informed consent was obtained from all participants, and then computed tomography (CT) scan was carried out in Department of Radiology within 5 days of onset of stroke. CT scan was again taken in patients who reported for follow-up after 3 months. Thorough history was taken, and clinical examination was done. Relevant investigations such as blood sugar and lipid profile were done. CT scan findings such as lesion

side (left/right/both), lesion location, lesion volume, pineal gland displacement, intraventricular spread of hemorrhage, and Barthel index scoring was done at time of admission and follow-up (3 weeks to 3 months). This study was aimed for the prognostic evaluation of the patient's recovery and rehabilitation management.

RESULTS

A total of 100 patients between age-group of 35 years and 85 years were divided into 5 groups. CT scan was done routinely and again during follow-up study after completion of treatment. In present study, 5 male and 8 female patients missed out of 100 patients. Most of the patients belong to age-group of 45–75 years with mean age of patients 60.28 years. The male patients (66%) were more common than female patients (34%), and the ratio between them was 1.9:1. Majority of them were retired, unemployed, or housewives (65%), and only 5% were government employed. The largest number came from the middle class (60%). The majority of patients under study were hypertensive (68%). Only two of such patients were hypotensive in the series. Surprisingly, only few cases were diabetic (9%), and majority of them came out to be nondiabetic individuals (87%). Most of the lesions were present in the left side of brain (53%), and few of them cannot be defined (2%). Six cases showed both side of the brain involvement. The CT scan finding of majority of individuals were ischemic (76%), and only 24% patients had hemorrhagic lesion. In all, 38 patients had ischemic lesion, while 15 had hemorrhagic lesion affecting on left side. In all, 33 patients had ischemic lesion,

and six patients had hemorrhagic lesion affecting the right side. Table 1 shows the level of consciousness at the time of admission and at the time of follow-up (1 month to 3 months). In follow-up, 13 patients were missed. The importance of rehabilitation is shown by Barthel index scoring at time of admission and follow-up. Supranuclear facial nerve palsy was a concomitant clinical presentation in 37% of the study group. Better recovery pattern was found in hemorrhagic patients (24) rather than ischemic patients (76). Thirteen patients were missed in follow-up. Better recovery pattern was found in right-side lesion rather than left-side lesion as shown in Table 2. Maximum number of patients were associated with risk factor of hypertension (68%) and least number with diabetes (9%) of 100 patients. Better recovery pattern was found in male patients rather than female patients. Maximum number of patients (34) were male in left-sided lesion, while least number were in female group affecting bilateral lesion (Table 3).

DISCUSSION

Stroke survivors invariably suffer from varying grade disabilities. A CT study provides enough information regarding the extent of lesion, site of lesion, various areas affected in the brain. In situations where the recovery is not up to the expectation even after best rehabilitation management, and Barthel Index shows a poor grading, a CT scan in the follow-up period helps in prognosticating future recovery status. The largest number of patients in this study belong to ischemic type of left side. The Barthel Index Scoring showed a better improvement in activity of daily living in ischemic patients. A remarkable pattern of recovery is seen in right side of brain lesion. In the present study, CT scan confirmation of stroke was done within 5 days of clinical onset with a mean time of 39.16 hours of onset which is comparable to the study of Tatu et al.² Dennis³ et al. also highlighted that CT scan should be performed ideally within 7 days after stroke onset. In this study, majority of the patients belong to age-group between 35 and 85 years divided into 5 groups of which age-group 45–75

Table 1: Level of consciousness

Level of consciousness	No. of patients	Follow up
Normal	86	83
Drowsy	14	4
Stupor	0	0
Comatose	0	0
Total	100	87

Table 2: Barthel index score according to side of lesions

Score	Left-side lesion				Right-side lesion			
	Admission time	(%)	Follow up	(%)	Admission time	(%)	Follow up	(%)
0–4	0	0	0	0	0	0	0	0
5–9	19	35.84	13	28.89	20	51.28	15	41.67
10–14	34	64.15	30	66.67	19	48.71	19	52.78
15–20	0	0	2	4.44	0	0	2	5.55
Total	53		45		39		36	

Table 3: Barthel index score according to type of lesions

Score	Hemorrhagic				Ischemic			
	Admission time	(%)	Follow up	(%)	Admission time	(%)	Follow up	(%)
0–4	0	0	0	0	0	0	0	0
5–9	8	33.33	2	9.5	27	35.52	17	25.7
10–14	16	66.67	18	85.7	49	64.47	46	69.7
15–20	0	0	1	4.8	0	0	3	4.5
Total	24		21		76		66	



years comprised of 93% with mean age of 60.28 years, which is comparable to the studies by Mc Kiscock et al.,⁴ Weisberg,⁵ and Fieschi et al.⁶ Male predominance over female (1.9:1) was also observed by Nilsson et al.⁷ In this study, hypertension is the most common risk factor as stated in study of Sheshardi et al. Similar observations were reported by Weisberg⁴ in 81%, by Douglas et al.⁸ (1982) in 80%, and 75% of ICH by Scott et al.⁹ In present the study, majority of cases come out to be non-diabetic individuals (87%). The U.K. prospective diabetes study group reported that aggressive treatment of blood pressure (<1 50/85 Hg) among type 2 diabetes reduced the risk of stroke by 44%.¹⁰ In this study, diabetes was found in 9% of cases as compared to 10% reported by Nilsson et al.¹¹ For diagnosis and differentiating the type of stroke as early as possible, CT scanning of the brain is the gold standard investigation technique and now in practice for most stroke survivors. Barthel index scoring is a good prognostic indicator from the beginning of rehabilitation services. In this way, it is possible to determine how well and how rapidly the patient has progressed toward independent ADL. People who suffer ischemic strokes have a much better chance for survival than those who experience hemorrhagic strokes. Among the ischemic stroke categories, the greatest danger is posed by embolic strokes followed by thrombotic and lacunar strokes. Hemorrhagic stroke not only destroys brain cells but also poses other complications, including increased pressure on the brain or spasms in the blood vessels, both of which can be very dangerous. Right hemisphere lesions are associated with an impairment in ability to sustain a posture. Successful functional motor rehabilitation of patients with left CVAs seems longer and more difficult than right CVAs as mentioned in the literature. Right-sided lesions had better recovery than left-sided lesions as evidenced by the Barthel Index Scoring.

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