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Research Article

DEFINING OUTCOME IN ACUTE STROKE PATIENTS USING BARTHEL INDEX AND MODIFIED RANKIN SCALE TREATED WITH NEUROPROTECTIVE AGENTS

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ABSTRACT

Objective: The present study was carried out to describe outcome in acute stroke patients by means of Barthel index (BI) and modified Rankin scale (mRS) treated with neuroprotective agents.

Methods: One hundred acute stroke patients were divided into two groups. Group I patients were treated with citicoline as neuroprotective agent and Group II patients were treated with cerebroprotein hydrolysate as neuroprotective agent. BI and mRS were applied at 1st, 3rd, 6th and 12th week respectively.

Results: The mean BI at 1st week in Group I was 35.3 and in Group II was 36.2, at 3rd week was 50.5 in Group I and 50.1 in Group II, at 6th week was 61.4 in Group I and 59.8 in Group II and at 12th week was 65.8 in Group I and 64.2 in Group II. The difference was non-significant (p>0.05). The mean mRS at 1st week in Group I was 4.5 and in Group II was 4.2, at 3rd week was 3.6 in Group I and 3.9 in Group II, at 6th week was 3.1 in Group I and 3.6 in Group II and at 12th week was 2.5 in Group I and 2.1 in Group II. The difference was non-significant (p>0.05).

Conclusion: A correlation between BI and mRS from baseline to end of 12 weeks within each group was highly significant.

Keywords: Stroke, Barthel index, Modified Rankin scale.

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INTRODUCTION

Stroke, a swift neurologic deficit of specious vascular origin, is a clinical syndrome rather than a solitary disease. A recurrent and stressful condition causes death of one-third of patients at 6 months and leaves another third perpetually reliant on the care of others [1]. Every year in the UK, 110,000 cases of fresh strokes and 30,000 cases of recurring strokes occurred; 10,000 strokes happened in younger individuals and 60,000 individuals died of stroke. It is the main reason of debility, and >5% of the National Health Commission and social services assets are disbursed by stroke patients. Precise management relies on quick diagnosis and treatment, exhaustive investigation, and rehabilitation [2].

Substantial efforts are made to develop drug treatments that may reduce brain damage and improve aftermath in patients with ischemic stroke. Barthel index (BI) is considered as consistent disability scale for stroke patients [3]. The items may be separated into a group that is related to self-care (feeding, bathing, grooming, dressing, bowel, and bladder care) and a group related to mobility (ambulation, stair climbing, and transfers), The maximal score is 100 if five-point increments are applied, representing that the patient is fully independent in physical working. The lowest score is zero, representing a totally reliant on bedridden state [4]. The modified Rankin scale (mRS) measures independence rather than performance of specific tasks. By this track, psychological and corporal adjustments to the neurological defects are assimilated. The scale consists of six grades, from zero to five, with zero corresponding to no symptoms, and five corresponding to severe disability [5]. The present study was conducted to express consequence in acute stroke patients using BI and mRS treated with neuroprotective agents.

METHODS

The present study was conducted on 100 acute stroke patients of both genders. All were informed regarding the study and their written consent was taken. Ethical clearance was taken before starting the study.

Data such as name, age and gender was recorded. Patients were divided into two groups. Group I patients were treated with citicoline as neuroprotective agent and Group II patients were treated with cerebroprotein hydrolysate as neuroprotective agent. We applied both the BI and mRS at 1st, 3rd, 6th, and 12th week respectively. Results were tabulated and subjected to statistical analysis. p<0.05 was considered significant.

RESULTS

Table 1 shows that Group I patients were treated with citicoline and Group II with cerebroprotein hydrolysate. Each group had 50 patients.

Table 2 and Graph 1 shows that mean BI at 1st week in Group I was 35.3 and in Group II was 36.2, at 3rd week was 50.5 in Group I and 50.1 in Group II, at 6th week was 61.4 in Group I and 59.8 in Group II and at

Table 1: Distribution of patients

Groups	Group I	Group II
Procedure Number	Citicoline 50	Cerebroprotein hydrolysate 50

Table 2: Assessment of BI in both groups

Groups	Group I	Group II	p-value
1st week	35.3	36.2	0.12
3rd week	50.5	50.1	0.15
6th week	61.4	59.8	0.25
12th week	65.8	64.2	0.92

BI: Barthel index

12th week was 65.8 in Group I and 64.2 in Group II. The difference was non-significant (p>0.05).

Table 3 and Graph 2 shows that mean mRS at 1st week in Group I was 4.5 and in Group II was 4.2, at 3rd week was 3.6 in Group I and 3.9 in Group II, at 6th week was 3.1 in Group I and 3.6 in Group II and at 12th week was 2.5 in Group I and 2.1 in Group II. The difference was non-significant (p>0.05).

Table 4 shows that common site was the left middle cerebral artery with BI index poor seen in 26, the right middle cerebral artery with BI index poor in 20, the left internal carotid artery with BI index poor in 17 and posterior cerebral artery with BI index poor in 13 patients.

Table 4 shows that common site was the left middle cerebral artery with poor BI index seen in 18, the right middle cerebral artery with poor BI index in 10, the left internal carotid artery with BI index poor in nine and posterior cerebral artery with BI index poor in 4 patients (Table 5).

DISCUSSION

Ischemia accounts for 85% of presentations and 15% for primary hemorrhage [6]. Hemorrhage is accountable for direct neuronal injury, and the pressure influence causes neighboring ischemia. Primary ischemia occurs from atherothrombotic occlusion or an embolism [7]. The most common sources of embolism are the left atrium in patients with atrial fibrillation followed by the left ventricle in patients with heart failure or myocardial infarction [8]. Vessel constriction ascends from atherosclerosis, characteristically in the internal carotid artery just overhead the carotid bifurcation or from small vessel lesion deep within the brain [9]. Ischemia causes direct injury from inadequate oxygenation and nutritional care. It sets up a series of neurochemical events that lead to spreading damage. The ischemia may be reversible if reperfusion is attained quickly, and the chemical injury may be interrupted by various neuroprotective drugs [10]. The present study was carried out with aim to define outcome in acute stroke patients using BI and mRS treated with neuroprotective agents.

In present study, Group I patients were treated with citicoline and Group II with cerebroprotein hydrolysate. Each group had 50 patients. The mean BI at 1st week in Group I was 35.3 and in Group II was 36.2, at 3rd week was 50.5 in Group I and 50.1 in Group II, at 6th week was 61.4 in Group I and 59.8 in Group II and at 12th week was 65.8 in Group I and 64.2 in Group II. Sulter *et al.* [11] in their study 15 trials satisfying the inclusion criteria were recognized. The BI was used in 13 and the mRS in eight subjects. In four trials mean and median scores of the BI were used, and in one trial median scores of the mRS were equated. BI in seven, the mRS in six, and combined the mRS and BI in three were included as Primary end points. With regard to the BI, a variety of total scores between 50 and 95 were implied as cutoff scores to define promising outcome.

We found that common site was the left middle cerebral artery with BI index poor seen in 26, the right middle cerebral artery with BI index poor in 20, the left internal carotid artery with BI index poor in 17 and posterior cerebral artery with poor BI index in 13 patients. The common site of occurrence was the left middle cerebral artery with BI index poor seen in 18, the right middle cerebral artery with poor BI index in 10, the left internal carotid artery with poor BI index in nine and posterior cerebral artery with poor BI index in 4 patients.

Table 3: Assessment of mRS in both groups

Groups	Group I	Group II	p-value
1st week	4.5	4.2	0.91
3rd week	3.6	3.9	0.82
6th week	3.1	3.6	0.94
12th week	2.5	2.1	0.96

mRS: Modified Rankin scale

Table 4: Site of infarct and functional outcome of BI score

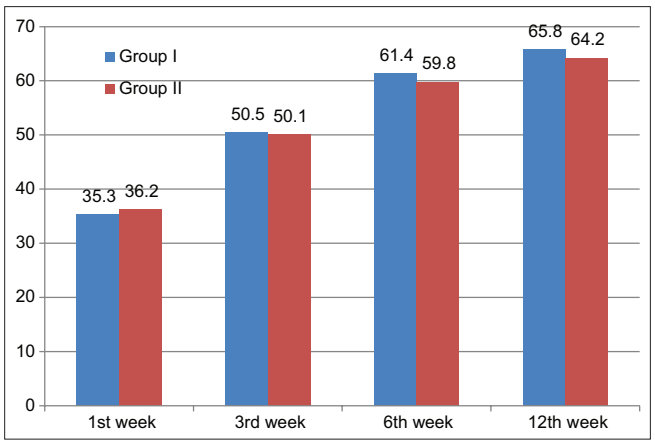
Site	Prognosis		Total
	Good (BI>90)	Poor (BI<90)	
The left middle cerebral artery	14	26	40
The right middle cerebral artery	5	20	25
The left internal carotid artery	2	17	19
Posterior cerebral artery	3	13	16
Total	24	76	100

BI: Barthel index

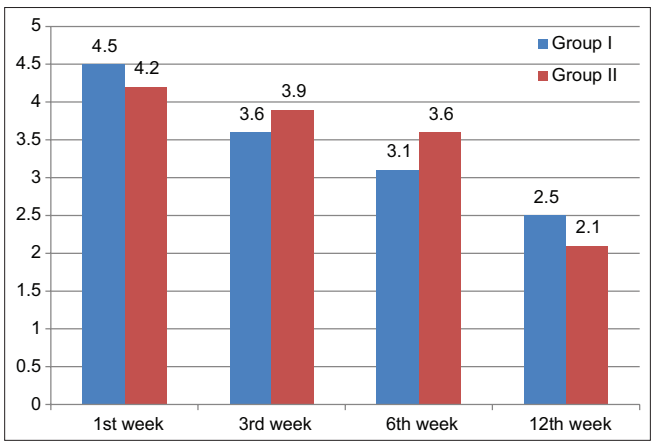
Table 5: Site of infarct and functional outcome of mRS score

Site	Prognosis		Total
	Good (mRS<3)	Poor (mRS>3)	
The left middle cerebral artery	22	18	40
The right middle cerebral artery	15	10	25
The left internal carotid artery	10	9	19
Posterior cerebral artery	12	4	16
Total	59	41	100

mRS: Modified Rankin scale



Graph 1: Assessment of Barthel index in both groups



Graph 2: Assessment of Barthel index modified Rankin scale in both groups

Intravenous recombinant tissue plasminogen activator (rt-PA) is an established therapeutic treatment modality for acute ischemic stroke (AIS) that supports in recanalization of the clogged arteries and mends final functional outcome. The management of AIS includes i/v thrombolytic, maintenance of blood sugar, blood pressure, temperature and increased intracranial pressure, and neuroprotective drugs. About 2–5% of cases are entitled to receive rt-PA treatment. This has driven the attention in the development of neuroprotective therapies [12]. The limitation of the study is small sample size.

CONCLUSION

Authors found that correlation between BI and mRS from baseline to end of 12 weeks within each group was highly significant.

AUTHORS' CONTRIBUTIONS

Dr. Inder pal Singh involved in data collection, data analysis, data interpretation, and writing the manuscript. Dr. Kamaldeep Kaur involved in data analysis, data interpretation, and writing the manuscript. Dr. Lovleen Bhatia involved in supervising entire research work, along with writing and finalizing the manuscript. Dr. Ajay pal involved in data analysis, data interpretation, and proof reading the manuscript.

CONFLICTS OF INTEREST

No conflicts of interest to disclose.

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