



A RETROSPECTIVE STUDY ON OUTCOME OF THROMBOLYSIS IN PATIENTS WITH ACUTE ISCHEMIC STROKE IN TERTIARY CARE HOSPITAL

Internal Medicine

Dr. Hari Salijamala DM Neurology Resident, Madurai Medical College, Tamil Nadu

Dr. Senthur Raja Pandian

Assistant Professor, Department Of Neurology Madurai Medical College, Tamil Nadu

Dr. M.R.

Manivannan

Professor and HOD, Department of Neurology, Madurai Medical College, Tamil Nadu

ABSTRACT

Background: Stroke is a major rising concern worldwide. Thrombolysis has shown a new light for treatment of acute ischemic stroke. It has shown good results especially if used in 4.5 hours of the window period. **Objectives:** To determine demographic profile, co morbidities, efficacy and safety and complications of intravenous alteplase (0-9 mg/kg) in study population. **Methods and materials:** We have taken data of acute ischemic stroke patients who underwent thrombolysis with alteplase. Data collection was retrospective and analysed from January 2021 to December 2022. Primary outcome was measured with NIH Stroke Scale (NIHSS) at admission and at discharge; and secondary outcome was measured with modified Rankin score (mRS) and NIHSS at three months. **Results:** We collected data of consecutive 51 patients who received alteplase for thrombolysis. Mean age was 53.84 years with majority of them being males. In our study, the mean window period was 186.6 $\pm$ 0.64 minutes. Primary outcome achieved 35 patients (68.63%) and poor outcome in the remaining 16 patients (31.37%). **Conclusions:** Thrombolysis has a more beneficial role than risk in reducing the mortality and morbidity of patients in patients of acute ischemic stroke.

KEYWORDS

Alteplase, Thrombolysis, Acute ischemic stroke, Complications, NIHSS, mRS.

I. INTRODUCTION

In the last few years, there was a tremendous change in the management of stroke. After ischemic heart disease, it is the second biggest cause of mortality. In an acute ischemic stroke, thrombolysis aids in the recovery of cerebral blood flow and may lessen the severity of the neurological impairments.¹ The better availability of neuroimaging services has enhanced the decision-making capacity for using acute thrombolysis. Considering coronary thrombolysis, Recombinant t-PA (rt-PA) was created in 1983 by expressing a cloned gene, and as a result, clinical trials were started. The National Institute of Neurological Disorders and Stroke study from 1995 demonstrated the efficacy of rt-PA as a therapy for AIS, which is now recommended for usage up to 4.5 hours after onset.³ The total dose of tPA administered is 0.9 mg/kg body weight; a 10% bolus is given first, followed by an hour-long infusion of the remaining amount.⁶ Due to low fibrin specificity, early intervention using streptokinase in AIS demonstrated an increased risk of cerebral haemorrhage and a lack of effectiveness. This research was conducted to evaluate the effectiveness of alteplase use in relation to risk factors for ischemic stroke.

II. MATERIALS AND METHODS:

This is a retrospective analysis of all patients given intravenous alteplase therapy for acute ischemic stroke from January 2021 to December 2022. Ethical approval was obtained from standard institutional ethical committee. Inclusion and exclusion criteria was strictly followed. All patients above 18 years presented with acute ischemic stroke in window period were taken for the study. Any prior history of haemorrhage, pregnancy, seizure disorder, bleeding disorder, persistent hypertension at arrival (SBP:185mm Hg or DBP:110mm Hg), NIHSS score of less than 4 at admission were excluded. Informed written consents were taken from all the patients or their relatives. Basic demographic information of the patients with acute ischemic stroke to emergency department, who have given informed consent, were collected. All the patients were clinically examined and computed tomography (CT) or magnetic resonance imaging (MRI) scan of brain, to rule out hematoma and magnetic resonance imaging stroke protocol to assess early infarct and any evidence of cerebral arterial occlusion was done. Thrombolysis was carried out in emergency department. Baseline risk factors, stroke characteristics, baseline NIHSS scores, mRS scores were collected. Follow up outcome assessed at discharge and 90 days was assessed by NIHSS score and mRS scale after 90 days. Primary outcome was measured by improvement of NIHSS score by four or more than four points at the time of discharge. Secondary outcome was measured by mRS score of 0 or 1. Complications after thrombolysis like symptomatic intracranial haemorrhage, GI haemorrhage, or any event

related symptoms were noted. Simple statistics were used for descriptive analysis. Spearman correlation was used for qualitative correlation of discrete variables. Statistical analysis was done using SPSS version 20.

III. RESULTS:

A total of 51 patients participated in our study. Out of 51, 39 (76.47%) were men and 12 (23.52%) were women. The average age of the studied population was 53.84 $\pm$ 10.90 years. The most common risk factors were alcohol, smoking, hypertension, tobacco and diabetes, dyslipidemia, followed by coronary heart disease in 32 patients (62.7%), 30 patients (58.8%), 26 (51.0%) and 20 (39.2%). in 14 patients. (27.5%) and 5 (9.8%). In our study, the average window period was 186.6 $\pm$ 0.64 minutes. Mean NIHSS score at admission 8.08 $\pm$ 3.86, at discharge 6.41 $\pm$ 3.91 and at three months 3.31 $\pm$ 0.91. Mean mRS score at entry 2.76 $\pm$ 1.07, 2.22 $\pm$ 1.05 at one month and 53.84 $\pm$ 10.90 at three months. In my study, the mean systolic blood pressure was 157.14 $\pm$ 22.67 and the mean diastolic blood pressure was 92.47 $\pm$ 10.44. Mean RBS at admission 170.75 $\pm$ 46.34. A primary outcome was achieved in 35 patients (68.63%) and a poor outcome in the remaining 16 patients (31.37%).

Table 1: age and sex distribution

Age	Sex		Total
	FEMALE	MALE	
31-40	3	4	7
41-50	1	11	12
51-60	5	12	17
61-70	2	11	13
>71	1	1	2
Total	12	39	51

Table 2: Prevalence of Risk factors in the study population

Risk Factor	Yes	No	Cum %
Smoking	30	21	58.8
Alcohol	32	19	62.7
Tobacco	20	31	39.2
Dyslipidemia	14	37	27.5
Hypertension	26	25	51.0
Diabetes	17	34	33.3
CAD	5	46	9.8

Table 3: characteristics of AIS

Characteristic	Mean	SD
Age	53.84	10.90

SBP	157.14	22.67
DBP	92.47	10.45
NIHSS at admission	8.92	3.78
NIHSS at 2 hrs	8.08	3.86
NIHSS at discharge	7.63	4.23
NIHSS at 3 months	6.41	3.91
mRS at admission	3.31	0.91
mRS at 1 month	2.76	1.07
mRS at 3 months	2.22	1.05

Table 4: Base line NIHSS Score

Baseline NIHSS	No	%
0-5	8	15.7
6-14	38	74.5
15-25	5	9.8
>25	0	0.0
Total	51	100

Table 5: characteristics of patients in the group of favourable and unfavourable outcome

Characteristic	Unfavorable (14)	Favorable (37)	P value
Age	53±10.89	54.14±11.04	0.759
Window period	2.78 ± 0.69	3.23 ± 0.57	0.22
NIHSS at admission	5.07±1.54	10.37±3.31	0.00*
SBP	169.0±19.9	152.6±22.2	0.020*
DBP	97.7±7.55	90.48±10.76	0.026*
RBS	161.0±42.6	174.4±47.7	0.364

Table 6: Spearman correlation of number of risk factors and mRS scores after three months (showed no significant correlation) (mRS – modified Rankin Scale)

Spearman's Correlation			Rfscore	Mrscoded
	Rfscore	Correlation Coefficient	1.000	.024
		P value	.	.865
		N	51	51
	mrscoded	Correlation Coefficient	.024	1.000
		P value	.865	.
		N	51	51

Table 7: mRS scores at admission and after three months were quantified. (mRS – modified Rankin Scale)

Grade	mRS at admission		mRS at 3 months	
	Frequency	Percent	Frequency	Percent
0	0	0	2	3.9
1	0	0	8	15.7
2	9	17.6	25	49.0
3	23	45.1	11	21.6
4	13	25.5	3	5.9
5	6	11.8	2	3.9
6	0	0	0	0

Table 8: Chi – square correlation between window period and mRS scores after three months

mRS 3 Months	Window period		Total
	< 2.5 h	> 2.5 h	
<2	10	25	35
>1	2	14	16
Total	12	39	51

Chi square value - 1.57, p-value – 0.209 (p>0.05, not significant)

Table 9: Correlation of NIHSS scores at admission with mRS scores after three months (showed significant association with value less than 0.05)

mRS 3 Months	NIHSS at adm		Total
	< 15	> 15	
<=1	35	0	35
>=2	12	4	16
Total	47	4	51

Chi square value – 9.49, p-value – 0.002 (p<0.05, significant)

Table 10: Complications in the study population

8	International Journal of Scientific Research
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Complication	Yes	No	Cum %
GI bleed	1	50	1.96
IC bleed	4	47	7.84
Death	2	49	3.92

IV. DISCUSSION

Thrombolysis has become extremely important in acute ischemic stroke in recent decades. Timely treatment has shown an improvement in quality of life. In our study, the average age was 53.84/-10.90 years, which was lower than the studies of Volans.P.et.al⁷, which showed an average age of 69 years, but a lower age group was found in the study by Hudad et al¹⁵, which had 49.21 years. A study by Akansha et al¹² showed that the mean age was 58 years. Our study showed that males predominantly underwent thrombolysis, like Lyden et al²². In our study, mean systolic blood pressure was 157.14 ± 22.67 mm Hg and DBP is 92.47 ± 10.45, similar to Werner Hacke et al¹⁰, where mean SBP was 152.6/-19.2 and DBP 84.4 +/-13.5¹⁰. The mean RBS in our study was 170.75+/- 46.34 which was higher than the study by Bruno et al²¹. In our study, the mean window period was 186.6 +/-0.64 minutes, which was higher than 76.8 minutes+/-12 in the study by Akansha et al.¹² This was lower compared to the study by Victor et al.¹³ with an average window period of 580 minutes. We found no significant correlation when we evaluated those arriving within 2.5 hours and those arriving within 2.5-4.5 hours and mRS scores. The mean NIHSS score at admission was 8.92 ± 3.78. It was lower compared to studies by Vikram Huded et al¹⁵ and was 15.5 +/- 2.7 in a study by Padma et al¹⁶. The mean mRS after three months was 2.22 ± 1.05 while it was 1-2 in study by Jagani et al¹⁴. The primary result was 68.63%, which was more than 65% in the study by Padma et al.¹⁶ Intracerebral hemorrhage was seen in 4 patients (7.84%) which was slightly higher than in a study done by Latchaw et al²⁰. with a mortality rate of 0.2%, which was lower than the study by Fischer et al.¹⁹

CONCLUSION

The primary aim of our study was to assess the utility of thrombolysis. Majority of our patients were males and the mean window period was 3 hours. Most patients who took alteplase achieved their primary goal, which was of reduced morbidity and mortality, in our study. In our study, NIHSS and mRS scoring scales were crucial in determining the morbidity and outcome.

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Conflicts of interest

There are no conflicts of interest.

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