

REPORTING TIME OF ISCHEMIC STROKE PATIENTS WITHIN THE TIME WINDOW FOR THROMBOLYSIS IN A TERTIARY CARE HOSPITAL AT RAWALPINDI

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ABSTRACT

Objective: To determine the reporting time of ischemic stroke patients within the time window for thrombolysis at Military Hospital (MH) Rawalpindi.

Design: A descriptive study.

Place and Duration of Study: Military Hospital Rawalpindi over a period of four months from Dec 2013 to Mar 2014.

Patients and Methods: Patients admitted to MH Rawalpindi with symptoms suggestive of stroke and having objective focal neurologic deficits consistent with stroke were included in the study. A CT scan of brain was carried out immediately to rule out intracranial bleed. The CT scan of brain was either normal or revealed radiological findings suggestive of an infarct.

Results: A total of 86 patients met the inclusion criteria of the study. Only 19 (22%) patients with ischemic stroke presented to the hospital within 4½ hours after onset of their symptoms.

Conclusion: Only a small number of ischemic stroke patients report to the hospital within the therapeutic window for thrombolytic therapy.

Keywords: Ischemic stroke, Reporting time (RT), Therapeutic window, Tissue plasminogen activator (TPA).

INTRODUCTION

Stroke, also called cerebrovascular accident (CVA), is the number one cause of major disability and the third most common cause of death in the developed and the developing countries¹. Approximately 80 percent of strokes are due to ischemic cerebral infarction and 20 percent are due to brain hemorrhage.

Approximately 15 million people worldwide suffer from stroke annually, of these more than 5.5 million die² another million are left with permanent disability⁵, posing burden on the family and community³. The exact incidence of stroke is not known in Pakistan. There is an estimated incidence of 250/100,000, of which 40% die within 6 months and the remaining 60% are added to the pool of disabled people⁴. The prevalence of stroke in Pakistan is reported to be twice the highest reported in the world⁵.

In ischemic stroke patients, treatment with

thrombolytic agents can restore blood flow to the ischemic brain tissue. However, three trials of intravenous IV streptokinase had to be stopped due to high rates of intracerebral hemorrhage and increased mortality⁶. After failure of streptokinase, thrombolysis with IV recombinant tissue plasminogen activator (TPA) was studied. In the European Cooperative Acute Stroke Study (ECASS) TPA was given within 6 hours of the onset of symptoms. Patients treated within three hours did better than those treated between three and six hours⁷. The National Institute of Neurological Disorders (NINDS) trial was the next stroke trial which showed that IV TPA improves functional outcome if given within 3 hours after onset of symptoms⁸. In the light of NINDS trial the therapeutic window for IV TPA was recommended at 3 hours after onset of symptoms. The ECASS 3 clinical trial suggested that TPA is beneficial when given up to 4.5 hours after stroke onset⁹. The therapeutic window for TPA now has been extended to 4½ hours.

Intravenous TPA is the only approved therapy for acute ischemic stroke at present. It

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Received: 04 Aug 2014; Accepted: 28 Aug 2014

must be given as soon as possible as its' benefit decreases over time. The majority of stroke patients do not reach the hospital in time to be eligible for thrombolysis¹⁰. TPA is presently not registered with Drug Regulatory Authority of Pakistan and is not available here for routine use. However, it is expected that it will be available for thrombolysis of stroke patients in this country in the near future.

This study was carried out to determine the reporting time of ischemic stroke patients to the hospital within therapeutic window of 4½ hours which, hypothetically, could make them eligible for iv thrombolysis with TPA.

PATIENTS AND METHODS

This is a descriptive study conducted at Military Hospital (MH) Rawalpindi from Dec 2013 to March 2014.

Patients admitted to MH Rawalpindi with symptoms suggestive of stroke and having objective focal neurologic deficits were subjected to a plain CT scan of the brain. Patients with normal CT scans of brain and those with radiological findings consistent with infarct were included in the study. Patients with intracranial bleed revealed by CT scan were excluded from the study.

Eighty six patients in serving and retired soldiers and junior commissioned officers (JCOs) of Pakistan armed forces and the families of serving soldiers and JCOs were included in the study. Families of retired soldiers and JCOs were not included in the study because they were entitled at Fauji Foundation Hospital (FFH) Rawalpindi. Officers and their families were also excluded from the study because they were entitled for admission to Combined Military Hospital (CMH) Rawalpindi.

Detailed history was taken at presentation and physical examination was done. In addition to a plain CT scan other baseline investigations including ECG, complete blood count, blood sugar, lipid profile, liver function tests, renal function tests were carried out at presentation. More detailed investigations including Echo-cardiography, Carotid Doppler studies and in selected cases MRI and MRA of the brain were performed after

admission. Data has been analyzed using SPSS version 17. Descriptive statistics were used to describe the results.

RESULTS

A total of 86 patients were included in the study; 74 (86%) were males, 12 (12%) were females. The small number of females highlights the fact that the families of retired soldiers and JCOs are not admitted to MH Rawalpindi. The majority (50%) had left middle cerebral artery territory stroke followed by

Table-: Reporting time (RT) of the stroke patients after onset of their symptoms.

S. no	RT	No of Patients
1.	1 hour	5 (5.8%)
2.	2 hours	9 (10.5%)
3.	3 hours	1 (1.2%)
4.	4 hours	4 (4.6%)
5.	4½ hours	0 (0%)
6.	> 4½ hours	67 (77.9%)

Right middle cerebral artery territory stroke (41%) and posterior circulation territory stroke (9%).

The age range of study population was from 27 to 95 years, 81 (94%) patients being in the age range of 41 to 80 year.

Reporting time (RT) of the stroke patients to the hospital after onset of stroke symptoms was within 3 hours in 15 (17%) patients and less than 4½ hours in 19 (22%) patients (Table). The remaining 67 (78%) patients reported after 4½ hours. Reporting time of stroke patients after onset of their symptoms (n= 86).

DISCUSSION

Intravenous thrombolytic therapy with TPA reduces morbidity when given within 4½ hours after onset of stroke. It does not significantly increase mortality in stroke patients¹¹.

However, acute ischemic stroke patients are infrequently treated with TPA despite its proven effectiveness for reducing morbidity after stroke. The main reason for this is that

majority of the stroke patients do not reach the hospital within time window for TPA administration. The contributing factors for the delay in reporting time to the hospital may include poor public knowledge of stroke signs and importance of early presentation to the hospital and delays in emergency transport¹².

Most of the clinical data regarding the reporting time of the stroke patients to the hospital is available about the original therapeutic window of three hours (NINDS trial). Kleindorfer et al reported in their large population based study at Cincinnati metropolitan area between July 1, 1993 and June 30, 1994 that only 22% of their ischemic stroke patients arrived in the emergency department in <3 hours after onset of their stroke symptoms¹³. In a study at California over a 3-month period, only 23.5% patients with ischemic stroke arrived at the emergency department within 3 hours of onset of their symptom¹⁴. Barber et al, in their study at a university teaching hospital in Calgary region between October 1996 and December 1999, reported that only 27% of their ischemic stroke patients were admitted to the hospital within 3 hours of onset of their symptom¹⁵.

Katzan et al observed that only 15% of ischemic stroke patients arrived at hospital within 3 hours in a Cleveland, Ohio, community from June 15, 1999 to June 15, 2000 thus making delayed reporting time the most common reason for ineligibility for IV TPA¹⁰.

In the above studies the therapeutic window for thrombolysis (3 hours) was based on the original NINDS trial. If we compare our results with above studies then only 17% of our patients presented within the first 3 hours after onset of symptoms as compared to 22% in Cincinnati metropolitan area¹³, 23.5% in an emergency department at California¹⁴ and 27% in Calgary region¹⁵. The number of patients reported to hospital within 3 hours in the California and Calgary communities was even greater than the number of patients who reported within 4½ hours (22%) in our study. Only patients of ischemic stroke in a Cleveland community¹⁰ reported in less number (15%) in the first 3 hours as compared to

our patients. Moreover, increasing therapeutic window from 3 hours (NINDS trial) to 4½ (ECASS 3 trial) increased the number of potential candidates for thrombolysis from 17% to 22% in our study population.

CONCLUSION

A very small percentage of ischemic stroke patients report in hospital within time window (<4½ hour) for thrombolytic therapy with TPA. Thrombolytic therapy for acute stroke will not have a major impact on death and dependency unless it is accessible to more patients. Strategies should be devised to reduce the time to treatment if thrombolytic therapy is to achieve widespread use in the future. There is a need to create awareness in general public regarding stroke and improve capacity building in order to meet the future challenges.

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