

Frequency of Early Seizures in Patients of Acute Ischemic Stroke

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ABSTRACT

INTRODUCTION: Stroke is the most common neurological disorder and leading cause of death and disability worldwide. Post stroke seizures are not uncommon complication of stroke, if remain untreated it may increase the rate of mortality in stroke patients.

OBJECTIVE: Aim of this study is to determine the frequency of early seizures (ES) among patients presenting with acute ischemic stroke at a tertiary care hospital.

MATERIALS & METHODS: Descriptive case series study, conducted at Department of neurology (SMBBMU) Shaheed Mohtarma Benazir Bhutto Medical University Hospital, Larkana for a Period of six months. A total number of 155 patients were enrolled according to inclusion and criteria.

RESULTS: Among 155 patients 103 patients (66.45%) were in 6th decade of life. Male patients were higher in frequency 89(57.42%) than female 66 (42.58%) patients. The mean age (\pm SD) of patients was 55.38 (\pm 5.66) years with range of 39-65 years. At presentation, the mean duration (\pm SD) of stroke was 3.59 (\pm 1.94) days. Mean time (\pm SD) lapsed between stroke and occurring of seizure was 3.09 (\pm 2.98) days with range of 0-9 days. Mean duration (\pm SD) of seizures was 3.27 (\pm 1.95) minutes. In this study 11(7.1%) patients of ischemic stroke have early seizures occurrence and frequency of male 9(10.1%) patients is higher as compared to female patients 2 (3%) Patients with male gender, elder age, longer stroke to fit duration and rural living patients were more prone to this complication of acute ischemic stroke.

CONCLUSION: The early onset seizures in ischemic stroke patients is not common, however when occurs increases morbidity.

KEYWORDS: Early onset seizures, acute ischemic stroke, Cerebral vascular accident.

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INTRODUCTION

Stroke is the most common neurological disorder. and WHO has defined stroke as "rapidly developed clinical signs of focal or global disturbance of cerebral function, lasting more than 24 hours or until death, with apparent vascular cause"¹. Stroke is the second leading cause of death after cancer and ischemic heart disease and it is also common cause of disabilities worldwide, approximately one third of all stroke affected people die while other remaining live a dependent life with different complications.² Stroke is sub divided clinically into two types; ischemic and hemorrhagic stroke, Ischemic stroke is common (87%) and may result from arterial blockage by thrombus or embolus. Stroke can cause many complications like occurrence of seizures, which may be single seizures or may lead to status epilepticus especially in the elderly population³. Exact mechanism of post stroke seizure is not known but this condition is associated with worse prognosis because repeated seizures in ischemic stroke patient will increase infarct size and

slow the functional recovery of patient.⁴⁻⁶

Stroke is the common etiological factor of epilepsy in adults, account for up to 11% of all etiologies in epileptic patient, approximately one-third of newly diagnosed seizures and epilepsies are appear to be stroke related especially in elderly population³. Post stroke epilepsy is common and risk increases more in patients with cortical and larger lesions⁷. Stroke can increase 23 to 35 fold increase in seizure incidence which may lead to the risk of development of epilepsy in stroke patients⁸. Seizures in stroke patients are classified as early seizures or late onset seizure. Seizures occurring within 24 to 48 hours or within one week after stroke are considered to be early seizures, which are associated with more complications when compared to late seizures (those occurring at least two weeks after a stroke)^{9,10}. Post stroke seizure frequency is reported from 9% to 13% in different studies^{11,12}.

The severity of stroke in patients with post stroke early seizure was found greater (National Institute of Health

Stroke Score Scale >14) with its associated higher mortality (37.9%) when compared to stroke patients without early seizures (14.4%)^{13, 14}

Main objective of this study is to determine the frequency of early seizures (ES) among patients presenting with acute ischemic stroke at a tertiary care hospital with an aim to highlight the magnitude of burden of early seizures in ischemic stroke.

MATERIAL & METHODS

This Descriptive case series study was conducted at Department of Neurology, Shaheed Mohtarma Benazir Bhutto Medical University Hospital (SMBBMU) Larkana for a Period of six months from 17-08-2014 to 16-02-2015. A total number of 155 patients were enrolled through non probability consecutive sampling technique according to pre-determined inclusion and exclusion criteria.

Inclusion Criteria: Newly diagnosed patients of ischemic stroke of either gender aged between 18-65 years.

Exclusion Criteria: 1) Traumatic brain injury or trauma secondary to fall during stroke. 2) History of preceding seizures or diagnose case of epilepsy. 3) Electrolytes imbalance (hypoglycaemia, hyponatraemia, hypocalcaemia). 4) Hemorrhagic stroke, transient ischemic attacks (TIAs), venous thrombosis. 5) Meningitis (Bacterial, tuberculosis, viral, TB), Brain Abscess, Meningioma, Cardiac arrhythmia, hepatic encephalopathy & uremia. 6) Patient presenting with persistent coma (GCS ≤7).

After taking consent from patient or the immediate attendant, data was collected on preformed questionnaire especially designed for study. All patients were followed in ward till the end of seventh post-stroke day. Statistical Analysis was done through SPSS-19. Mean ± SD was expressed for continuous variable like age, duration of symptoms, duration of fits & post-stroke day on which seizure episode occurred. Frequency & percentages were expressed for the development of early seizures (outcome variable) within seven days of stroke. To evaluate the effect modification of outcome variable (frequency of early seizure) by age, gender, duration of stroke, duration of fits & post-stroke day on which fits appeared; these variables were stratified. Post stratification the chi-Square test was applied while taking the P value of ≤0.05 as significant.

RESULTS

The mean (±SD) age of patients was 55.38 (±5.66) years with range of 39-65 years. The mean (±SD)

duration of stroke with which patients presented was 3.59 (±1.94) days (Range: 1-7 days). The mean (±SD) duration of seizures occurring was 3.09 (±2.98) days with range of 0-9 days after the occurrence of stroke. Mean (±SD) duration of seizures was 3.27 (±1.95) minutes with a range of 1-7 minutes as shown in table 1. In this study 103 patients (66.45%) were of age between 51-60 years, while those above 61 years of age were 35 (22.58%). Only 12(7.74) patients were between 41 to 50 years; 5 (3.32%) were aged up to 40 years. In current study 89(57.42%) stroke patients were males and female patients were 66(42.58% (Figure II).

In this study out of 155 patients, 99(63.9%) belonged to rural areas among them 6(6.1%) had early onset seizures. Main objective of this study was to measure the frequency of early onset of seizure in acute ischemic stroke patients and results shows that 11 (7.1%) of such patients had developed early onset of seizures as shown in (Figure III). It was noted that 9 (10.1%) male patients developed early onset of seizure versus 2 (10.1%) female patients; (P value = 0.080) as shown in (Table II).

The results showed that none of the patients of ischemic stroke up to aged 40 developed early onset seizure. However this increased with increasing age, and reached to 33% in age 41-50 years and then decline to 5.7% in those of age 60 years or above (P value = 0.003) (Table III). We also noted that the frequency of early onset seizure increases with post stroke duration. On the day one no case of early onset seizures was noted, however between day 2-4 there were 2.7% cases observed which increased to 15.8% between day 5-7 after acute ischemic stroke (P value = 0.005). Likewise it is also noted very highly significantly (P value <0.001) that the cases of seizure episode occurred more as the stroke - fits duration progressed.

TABLE I: BASELINE STATISTICS

Variable	Min	Max	Mean	±SD
Age (Years) (n= 155)	39	65	55.38	5.66
Duration of stroke (Days) (n= 155)	1	7	3.59	1.94
Seizure occurred on which post stroke day (n= 11)	0	9	3.09	2.98
Duration of fits (minutes) (n= 11)	1	7	3.27	1.95

TABLE II: EFFECT OF GENDER OF PATIENTS ON FREQUENCY OF EARLY ONSET SEIZURE IN ACUTE ISCHEMIC STROKE

Gender	Early onset seizure		Total
	Yes	No	
Male	9 (10.1%)	80(89.9%)	89
Female	2 (3.0%)	64 (97.0%)	66
Total	11 (7.1%)	144 (92.9%)	155

TABLE III: EFFECT OF AGE OF PATIENTS ON FREQUENCY OF EARLY ONSET SEIZURE IN ACUTE ISCHEMIC STROKE

Age categories	Early onset seizure		Total	P value
	Yes	No		
Up to 40	0	5	5	0.003
	0.0%	100.0%	100.0%	
41-50	4	8	12	
	33.3%	66.7%	100.0%	
51-60	5	98	103	
	4.9%	95.1%	100.0%	
61 & above	2	33	35	
	5.7%	94.3%	100.0%	
Total	11	144	155	
	7.1%	92.9%	100.0%	

DISCUSSION

Stroke is very common in developed as well as in developing countries and alarming issue of our community, Seizures along with ischemic stroke are usually associated with unfavorable prognosis. These seizures may occur in early (7-14 days) clinical course or as a late complication when occur after 14 days. The current study found that 11 (7.1%) patients of acute ischemic stroke had developed early onset of seizures. Various studies have reported its rate variably ranging from 5% to 15% of incidence of early onset seizures among patients of acute ischemic stroke¹⁵. Similar to current study, another study from Pakistan reported 9% rate of early onset of seizures in patients of acute ischemic stroke.

In this study, early onset seizure found more prevalent among male patients (n=9,10.1%) as compared to the female patients (n=2, 3%) (p value = 0.080). Published data from developed countries also support this finding of male preponderance for early onset sei-

zure¹⁶. The mean (\pm SD) age of our patients was 55.38 (\pm 5.66) years; the youngest patient was 39 years old while the elder patient was 65 years old, almost identical results were reported by Khealani BA, et al¹⁶.

In general stroke incidence increases with age and in male patients in developing as well as developed countries, however mortality rate is significantly less in developed countries probably as they have much better health care system for management of stroke risk factors, acute stroke care and prompt treatment of complication related with stroke¹⁷. We found that patients of acute ischemic stroke when presented late; (stroke to fit interval) had higher frequency of seizures. In other words sooner the patient brought to hospital after stroke, lesser were chance of having early onset of seizures, both these findings were highly significant (P values = 0.005 and <0.001 respectively).

In other studies it is reported that early-onset seizures commonly occur during the first 1 to 2 days after ischemic stroke and they also found 43% to as much as 90% of patients had seizure episode within the first 24 hours^{6,13,18}. This study also highlighted the significance of post stroke seizures, as these may worsen prognosis.

CONCLUSION

The early onset seizures are not uncommon after ischemic stroke, therefore early referral of all such cases to tertiary care must be encourage. Prompt management of ischemic stroke may subsequently reduce prevalence of early onset seizure with consequent better outcome. .

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