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Original Article

To Determine the Frequency of Seizures in Patients Presented with Acute Stroke in Mayo Hospital, Lahore

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Abstract

Objective: To determine the frequency of seizures in patients presenting with acute stroke in Mayo Hospital, Lahore.

Methods: This descriptive case series study was conducted in Medicine Department, Mayo Hospital, Lahore from June 10, 2020 to December 09, 2020. Total 215 cases with acute stroke were enrolled from the Medical Department of Mayo Hospital, Lahore. Detailed history and physical examination were done by the researcher to ensure unbiased approach. Study was done as per Helsinki declaration. The patients were followed for 14 days after stroke. The frequency of seizures (according to operational definition) in patients with acute stroke within the first 14 days was noted. Data was scrutinized in SPSS v25.0. Stratification for age, gender and type of stroke was done. Chi-square test was applied after stratification and p-value ≤0.05 was taken as significant.

Results: Total 215 patients presenting with acute stroke were enrolled in this study. There were 134(62.3%) males and 81(37.7%) females. Mean age of subjects was 55.9±15.4 years. Overall frequency of seizures in patients with acute stroke was 40(18.6%).

Conclusion: Seizures are not uncommon after developing an acute stroke, hence very early referral of all such cases to tertiary care hospitals must be encouraged. Quick management of acute stroke may subsequently decrease prevalence of developing seizures resulting in a better outcome.

Keywords: Seizures, Ischemic Stroke, Hemorrhagic Stroke.

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Introduction

Stroke is perhaps the most common neurological disorder and according to the World Health Organization, it is characterized by quickly emerging clinical signs indicating either localized or widespread disruption of brain function, persisting for over 24 hours or leading to death.[1] It is the 2nd leading cause of death after cancer & ischemic heart disease and also a common cause of disabilities throughout the world. Approximately one third of all stroke persons die, while others live a dependent life with various complications.[2] It is sub-divided clinically into two types; ischemic and hemorrhagic. Ischemic stroke is common (87%) and may result from narrowing of an artery by thrombus or embolus. Stroke can cause lots of complications e.g., seizures, which may be a single episode or may progress to status epilepticus especially in the elderly patients.[3] Early-onset seizures are common after stroke and have been reported to occur in 4.2% patients within 14 days after stroke.[4] Following stroke, seizures are associated with a greater resource use, longer hospital stays, and a higher death rate.[5] In addition, the quality of life is severely impacted by seizures in the elderly age group. These impacts include limitations on driving, increased risk of falls, and heightened vulnerability to side effects from antiepileptic medications.[6-7] Post stroke epilepsy is common and the risk enhances more in those with cortical and larger lesions.[8] Stroke can result in 23-to-35-fold increase in seizure incidence which may lead to development of epilepsy.[9]

Seizures in stroke patients are divided into early or late onset. Early seizures are defined as those that happen within a week and are linked to more serious consequences than the late seizures, which happen at least two weeks following the stroke.[10-11] In other studies, frequency of seizures was noted to be 3%12, 7.1%[13] and 5.3%[14] in acute stroke patients.

The rationale of this study is that no local study has been performed yet. While the international studies are also indicating significant variation, the results of current study would help clarify the above variation in our target population and also record the exact frequency, as majority of the patients are not diagnosed or remain undiagnosed for seizures in these cases. Results of this study would be helpful for timely management of seizures.

Methods

The study was performed in the department of medicine, Mayo Hospital, Lahore. It was a descriptive case series and was performed from June 10th, 2020 to December 10th, 2020. Sample technique was non-probability consecutive sampling. 215 as the sample size was calculated with 95% confidence level, 5% margin of error and anticipated proportion of seizures was taken as 13% with acute stroke.[12] Inclusion Criteria: All diagnosed cases of acute stroke presenting within 14 days of symptoms (according to operational definition) between 30-80 years of age and of either sex. Exclusion Criteria: Patients with previous history of stroke, all epileptic cases (on history and medical record and not willing to participate in the study were excluded. After taking approval from College of Physicians & Surgeons Pakistan, a total of 215 cases who fulfilled the selection criteria were enrolled. Informed consent from all patients was taken to include their data in the study. Thorough history and physical examination were performed by the researcher to ensure unbiased approach. Study was performed as per Helsinki declaration. Patients were monitored for 14 days after stroke. Occurrence of seizures within first 14 days was noted. All this information was recorded by the researcher on pre-formed proforma. Data analysis was done using SPSS v25.0. Mean and SD were calculated for quantitative variables. Frequencies and percentages were calculated for qualitative variables. Stratification was done for age, gender and type of stroke. After stratification, Chi-square test was applied and p-value ≤0.05 was seen as significant.

Acute stroke was considered when patients developed clinical signs of focal or diffuse neurological deficit (weakness of limbs, sensory loss, speech/ swallowing disturbance) diagnosed on CT scan as hypodense area (ischemic stroke) or hyperdense area (hemorrhagic stroke) presenting at any time within 14 days of onset of signs and symptoms. A seizure was taken as a sudden, un-controlled generalized or focal body movement with one or more of these: loss of consciousness, tongue bite, urinary or fecal incontinence within 14 days of stroke. It was determined on clinical examination / history of one or more episodes were labeled as a seizure.

Results

Total 215 presenting with acute stroke were enrolled in this study. There were 134(62.3%) males and 81 (37.7%) females. The mean age of subjects was 55.9 ± 15.4 years. There were 72(33.5%) subjects in 30 to 45-year age group, while 46(21.4%) and 97(45.1%) were in the 46 to 60-year age group and >60-year age group respectively. According to the type of stroke, 140(65.1%) had ischemic stroke and 75(34.9%) had hemorrhagic stroke. Total occurrence of seizures in patients with acute stroke was 40(18.6%).

Table 1: *Frequency of distribution of type of stroke*

Type of stroke	Frequency	Percentage
Ischemic stroke	140	65.1
Hemorrhagic stroke	75	34.9
Total	215	100.0

Table 2: *Frequency of distribution of seizures*

Seizures	Frequency	Percent
Yes	40	18.6
No	175	81.4
Total	215	100.0

Table 3: *Stratification of seizure with respect to gender*

Gender	Seizure		Total	p-value
	Yes	No		
Male	28	106	134	0.267
	20.9%	79.1%	100.0%	
Female	12	69	81	
	14.8%	85.2%	100.0%	
Total	40	175	215	
	18.6%	81.4%	100.0%	

Table 4: *Stratification of seizure with respect to the type of stroke*

Type of stroke	Seizure		Total	p-value
	Yes	No		
Ischemic stroke	27	113	140	0.726
	19.3%	80.7%	100%	
Hemorrhagic stroke	13	62	75	
	17.3%	82.7%	100%	
Total	40	175	215	
	18.6%	81.4%	100%	

Discussion

For long, it has been believed to be a link present between seizures and stroke.[15] Incidence of epilepsy evolves with age, showing upward tendency in those over 60 and declining trend in younger age groups.[16] With prevalence of 2-4%, stroke may be the most common cause of epilepsy over 60 years.[17] Bhojo et al. reported that occurrence of post-stroke seizures was 8%, with 117/1,548 stroke patients experiencing seizures.[18] Of these, 21% still experienced seizures a year later. Marginally higher frequency, specifically 13%, is displayed by Republic of India.[19] Conversely, China displays lower frequency, 3.4%.20 Organised comments revealed that 8.61% of seizures were linked to ischemic CVA and 10.61% were linked to haemorrhages. Haemorrhagic stroke patients have a poor prognosis with a high in-hospital death rate and a much higher frequency of early seizures; nevertheless, recurrence is minimal. After stroke, late seizures typically occur 0.5–2 years later and have high recurrence possibility. Most people at high risk have anterior circulation stroke, which is characterised by massive cortical infarct in parietal-temporal area. After ischemic CVA, late onset first seizures are an independent risk factor for epilepsy, but not after haemorrhagic CVA.[21] Up to 20% of seizures in people with a history of cerebral infarction may subsequently be diagnosed as stroke's clinical manifestation. It was discovered that presence of seizures at the beginning of first-ever stroke was a separate predictor of in-hospital death.[22] According to Arboix et al., elderly with significant parietal lobe haemorrhagic CVA have the highest chance of suffering scar epilepsy. These individuals may benefit from preventative anti-epileptic medications administered for a few days.[22] Mean age of 56 years in this series is consistent with previously reported increased occurrence of PSS in middle age/elderly patients.[23] Epilepsy is an infrequent major problem in young cryptogenic ischemic CVA survivors.[16] It was found in one study, that earlier mean age was 45.41 years at first seizure after stroke, this study has registered wide spectrum of patients i.e. 5 months to 76 years.[16] As noted in earlier studies, it was found that there are more males than females.[16,19,24] But in one study, it was found that frequency of post-CVA seizures was same for both genders.[18]

Occurrence of early post-CVA seizures was very much similar to previous studies.[25] Seizure type comparison results in our study were a little dissimilar from other studies.[26-28] In one study, occurrence of seizures was noted to be 13% in acute CVA cases.[12] In another study, frequency noted was 7.1%.[13] In one more study, it was less, about 5.3%.[14] In 2000, there were 690 stroke cases for every 100,000 people. When stroke commonness in Thailand was compared to Asia, it was found to be higher than in Taiwan but lower than in India.[29-30] Lovett et al presented that respective recurrent CVA rate at 30 days & 3 months was 4.2 and 6.6% respectively.[31] A study done in Australia revealed that cumulative risk of first recurrent CVA in 10 years was 43%, with the utmost jeopardy in first 6 months after 1st stroke.[32]

Conclusion

As acute strokes frequently result in seizures, it is important to recognise that all cases of this sort should be referred to tertiary care as soon as possible. Prompt acute stroke treatment may lead to a decrease in the frequency of seizures and ultimately improve outcomes.

Ethical Approval: The IRB/EC approved this study via letter no. CPSP/REU/MED-2016-12151 dated 01-06-2020.

Conflict of Interest: None

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