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Etiology and outcome of patients with adult -onset seizure at No (2) Military Hospital, (500-bedded), Yangon, Myanmar

Kyaw Thura[1], Myint Thein Naing[2], Naing Ko Soe[2], Aung Myo Oo[2], Hein Zaw Zaw[1], Ye Minn Htun[3], Ohnmar Saw[1] & Nwe Nwe Win[2]

[1] 1Department of Neurology, No (2) Military hospital, (500-bedded)

[2] Department of Neurology, Defence Services Medical Academy, Myanmar

[3] Department of Preventive and social medicine, Defence Services Medical Academy, Myanmar.

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***Corresponding author:** Kyaw Thura

Abstract

Background: *Adult-onset seizures are a significant clinical problem with diverse etiologies and variable outcomes.*

Methods: *This hospital-based descriptive study was conducted at No. (2) Military Hospital (500-bedded), Yangon, Myanmar, from January to December 2024. A total of 19 patients aged ≥18 years presenting with new-onset seizures were included.*

Results: *Males predominated (84.2%), with most patients in the 41–60-year age group. EEG findings were normal in 36.8% of cases, while non-epileptiform abnormalities were most common (47.4%). Mesial temporal sclerosis was the leading etiology (26.3%), followed by encephalitis (15.8%). Most patients (89.5%) were discharged, while 10.5% died; all deaths were associated with secondary brain metastasis.*

Conclusion: *Structural brain abnormalities were the predominant cause of adult-onset seizures. Outcomes were generally favorable, except in patients with metastatic disease.*

Keywords: *Adult-onset seizure; Etiology; EEG; Mesial temporal sclerosis; Encephalitis; Outcome*

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1. Introduction

Seizures are an important cause of morbidity and mortality in adults. Despite numerous studies on seizure classification and epilepsy syndromes, relatively few have focused on the clinical profile and causes of adult-onset seizures.[1] Adult-onset seizure is defined as the first seizure, or cluster of seizures within a 24-hour period, occurring after the age of 18 years. These seizures may arise from a wide range of causes, including primary neurological disorders, systemic diseases, and brain injury.

Seizures are common in the general population, with approximately one in ten individuals experiencing at least one seizure during their lifetime. Most of these seizures are provoked by acute events and are not related to epilepsy.[1] The incidence of new-onset epilepsy in older adults ranges from 1 to 3 per 1000 persons per year and is estimated to be two to six times higher than in younger adults.[2]

Adult-onset seizures are more prevalent among older males, and cerebrovascular diseases (CVDs) are the most commonly identified etiology across both sexes. In contrast, idiopathic epilepsy syndromes are more frequently observed in younger adults.[1]

A study from Pakistan reported that among 198 patients with new-onset seizures, no cause was identified in 4% of cases. Structural brain lesions were the most common etiology (89.6%), including neurological, infectious, systemic, metabolic, and toxicological causes.[3] Similarly, a study conducted in Egypt found that cerebrovascular diseases were the leading cause of new-onset seizures in adults, followed by idiopathic epilepsy, metabolic disorders, brain tumors, post-traumatic epilepsy, encephalitis, and cryptogenic causes.[1] Idiopathic epilepsy was the predominant cause in younger adults, whereas cerebrovascular diseases were most common in older individuals.[1]

Adult-onset seizures can result in a wide range of outcomes, from complete recovery to long-term disability. Therefore, understanding their etiology and outcomes is essential for appropriate diagnosis, management, and prognostication. However, there is limited information regarding the clinical profile and causes of adult-onset seizures in Myanmar.

Studies from countries such as Pakistan and Egypt provide valuable insights into the epidemiology and causes of adult-onset seizures. Structural brain lesions and cerebrovascular diseases are consistently reported as leading etiologies.[1,3] Nevertheless, regional variations in disease patterns highlight the need for country-specific data.

Given the limited evidence from Myanmar, further research is necessary to better understand the etiology and outcomes of adult-onset seizures in this setting. Such knowledge is crucial for improving patient care, optimizing resource allocation, and developing effective prevention and management strategies.

This study was therefore conducted to evaluate the etiology and outcomes of adult-onset seizures in a tertiary care military hospital in Yangon, Myanmar, and to contribute to the existing body of knowledge in this field.

2. Materials and Method

2.1 Study Design

This hospital-based observational descriptive study was conducted at No. (2) Military Hospital (500-Bedded), Yangon, Myanmar.

2.2 Study Population

According to the inclusion and exclusion criteria, all patients with adult-onset seizure admitted to medical wards or Neuro-medical wards of No. (2) Military Hospital (500-bedded), from January to December 2024, were included for the study

2.3 Study Area

Medical wards and Neuromedical wards at No. (2) Military Hospital (500-bedded)

2.4 Study Period

January 2024 to December 2024

2.5 Inclusion and Exclusion Criteria

2.5.1 Inclusion Criteria

Adult patients (18 years and above), presented to the outpatient department and admitted to medical wards and Neuro-medical wards of No. (2) Military Hospital (500-bedded), Yangon with new onset seizure were included.

2.5.2 Exclusion Criteria

1. Patients known as epileptic or with a past history of seizure disorder,
2. Patients aged <18 years old, and seizure mimics: syncope (cardiac arrhythmia, vasovagal syncope), migraine (especially presenting with isolated symptoms as vertigo, visual changes, and aphasia), vascular conditions (transient ischemic attacks), pseudoseizures/hysterical seizures, physiological nocturnal myoclonus, movement disorders, sleep disorders (cataplexy, narcolepsy, night terror), benign positional vertigo (BPV), hyperventilation syndromes, and psychiatric conditions (conversion, panic attacks)

2.6 Sampling Method

Consecutive sampling was used, including all eligible patients (n = 19).

2.7 Data Collection

Data were collected from medical records, including demographics, EEG findings, etiology and outcomes

2.8 Outcome measures

The immediate outcomes was reported as hospitalization or discharge from the hospital or death.

2.8 Statistical Analysis

- Mean ± SD for continuous variables
- Frequencies and percentages for categorical variables
- Chi-square test for association

2.9 Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee on Medical Research Involving Human Participants, Defence Services Medical Academy. Patient confidentiality was maintained.

3. Results

3.1 Age and gender distribution of patients with adult - onset seizure

The table shows the age and gender distribution of 19 patients with adult-onset seizures. Overall, males constituted the majority of cases (16/19, 84.2%), while females accounted for only 3 patients (15.8%). adult-onset seizures in this study were more common in

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males, particularly in the middle-aged group (41–60 years), and female cases were exclusively observed in this same age range.

Table 4.1 Age and gender distribution of patients with adult-onset seizure

Gender	Age group n (%)		
	18-40	**41-60**	**>60**
Male	6 (37.5)	9 (56.2)	1 (6.3)
Female	0 (0.0)	3 (100.0)	0 (0.0)

3.2 EEG findings among study patients

Overall, the findings indicate that although a substantial proportion of patients had normal EEGs, among abnormal results, non-epileptiform changes were most common, and temporal lobe involvement predominated among focal epilepsies.

Table 3.2 EEG Findings among study patients

EEG findings		**n**	**%**
Normal EEG		7	36.8
Non-epileptiform activity		9	47.4
Generalized epilepsy		1	5.3
Focal epilepsy	Temporal lobe epilepsy	6	31.6
	Frontal lobe epilepsy	1	5.3
	Parietal lobe epilepsy	1	5.3
	Occipital lobe epilepsy	0	0.0

3.3 Etiology of patients with adult-onset seizure

The table shows the etiological distribution of adult-onset seizures among 19 patients. Mesial temporal sclerosis was the most common cause, accounting for 26.3% of cases. Encephalitis was the second most frequent etiology (15.8%). Subcortical gray matter heterotopia, Cerebral venous sinus thrombosis, post-ischaemic stroke, and secondary metastasis each contributed 10.5% of cases. Neurocysticercosis, idiopathic causes, and metabolic disorders were less common (5.3% each). Overall, structural brain abnormalities were the predominant causes, consistent with previous studies reporting structural lesions as the leading etiology in adult-onset seizures.[3]

Table 3.3 Etiology of patients with adult-onset seizure

Etiology	**n**	**%**
Neurocysticercosis	1	5.3
Subcortical gray matter heterotopia	2	10.5
Cerebral venous sinus thrombosis	2	10.5
Mesial temporal sclerosis	5	26.3
Post ischaemic stroke	2	10.5
Idiopathic	1	5.3
Secondary metastasis	2	10.5
Metabolic	1	5.3
Post traumatic	0	0.0
Encephalitis	3	15.8

3.4 Distribution of etiology in accordance with different age groups

The table shows the distribution of seizure etiologies across different age groups. In the 18–40 group, subcortical gray matter heterotopia, idiopathic, and metabolic causes were most common, consistent with studies showing idiopathic etiologies predominating in younger adults.[1] In the 41–60 group, mesial temporal sclerosis and secondary metastasis were the leading causes, along with neurocysticercosis and encephalitis, reflecting the higher burden of structural and infectious causes reported in similar populations.[1,3] Cerebral venous sinus thrombosis and post-ischaemic stroke were observed in both younger and middle-aged groups, supporting evidence that vascular causes contribute across age ranges.[2] In patients older than 60 years, post-ischaemic stroke was the only identified etiology, aligning with studies indicating cerebrovascular disease as the most common cause of seizures in older adults.[1,2]

Etiology	**Age Group**					
	18-40		**41-60**		**>60**	
	n	**%**	**n**	**%**	**n**	**%**
Neurocysticercosis	0	0,0	1	100.0	0	0.0
Subcortical gray matter heterotopia	2	100.0	0	0.0	0	0.0
Cerebral venous sinus thrombosis	1	50.0	1	50.0	0	0.0
Mesial temporal sclerosis	0	0.0	5	100.0	0	0.0
Post ischaemic stroke	0	0.0	1	50.0	1	50.0
Idiopathic	1	100.0	0	0.0	0	0.0
Secondary metastasis	0	0.0	2	100.0	0	0.0
Metabolic	1	100.0	0	0.0	0	0.0
Post traumatic	0	0.0	0	0.0	0	0.0
Encephalitis	1	33.3	2	66.7	0	0.0

3.5 Outcomes among with adult-onset seizure

Among the 19 patients with adult-onset seizures, 2 patients (10.5%) expired. Notably, both of these patients had secondary brain metastasis as the underlying etiology, suggesting a strong association between metastatic disease and poor outcome in this study. In contrast, the remaining 17 patients (89.5%) were discharge.

Table 3.5 Outcomes among with adult-onset seizure

Outcomes	**n**	**%**
Discharged from hospital	17	89.5
Expire	2	10.5

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4. Discussion

This study provides insight into the etiological spectrum and outcomes of adult-onset seizures in a Myanmar hospital setting. The predominance of male patients and the peak incidence in the 41–60 years age group are consistent with previous studies.[1]

Structural etiologies, particularly mesial temporal sclerosis, were the most common cause in this study. This differs slightly from other studies where cerebrovascular diseases are reported as the leading cause, especially in older populations.[1,2] The relatively lower proportion of stroke-related seizures in this study may be due to the small sample size.

Infectious causes, particularly encephalitis, also contributed significantly, reflecting the ongoing burden of infectious neurological diseases in developing countries.[3]

Age-wise distribution showed that younger patients were more likely to have idiopathic or developmental causes, while middle-aged patients had more structural and infectious etiologies.[1] Older patients predominantly had vascular causes such as stroke, consistent with global trends.[1,2]

The overall prognosis was favorable, with most patients discharged. However, mortality occurred exclusively in patients with secondary brain metastasis, highlighting the poor prognosis associated with malignancy.

5. Conclusion

Adult-onset seizures in this study were predominantly due to structural brain abnormalities, with mesial temporal sclerosis being the most common etiology. Most patients had favorable outcomes; however, mortality was associated with secondary brain metastasis. Early identification of underlying causes, particularly serious conditions such as malignancy, is crucial for improving patient outcomes.

6. Limitation and recommendation

The main limitation of this study is the small sample size and single-center design, which may limit generalizability. Further large-scale, multicenter studies are needed to better understand the epidemiology of adult-onset seizures in Myanmar.

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