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ORIGINAL RESEARCH

CHARACTERISTICS OF EPILEPSY PATIENTS IN NEUROLOGY OUTPATIENT CLINIC SILOAM HOSPITALS LIPPO VILLAGE

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Abstract

Introduction: Epilepsy is a chronic neurological disorder affecting approximately 70 million people worldwide. Despite being a treatable condition, many patients in low- and middle-income countries especially Indonesia do not receive adequate Anti-Epileptic Drug (AED) therapy. Previous local studies have reported variations in patient characteristics but often lacked detailed data on epilepsy syndromes and neuroimaging findings. This study aimed to determine the clinical and demographic characteristics of epilepsy patients at the Neurology Outpatient Clinic of Siloam Hospital Lippo Village.

Methods: This study was a retrospective descriptive cross-sectional study. Secondary data were collected from 111 medical records of epilepsy patients treated at the Neurology Outpatient Clinic between 2022 and 2024. The sampling method used was non-probability convenience sampling. Data were analyzed using univariate statistical analysis, presented as frequencies and percentages.

Results: Of the 111 subjects, the majority were adults (69.4%) and male (55.9%). The most common seizure type and epilepsy type were focal seizures (53.2%). The most frequent epilepsy syndrome was temporal lobe syndrome (21.6%), and the most frequent etiology was unknown or idiopathic (64.9%). Monotherapy was the predominant treatment regimen (64.9%), with phenytoin (52.3%) and valproic acid (47.7%) being the most frequently prescribed AEDs. EEG findings were normal in 49.5% of subjects. Among patients with available neuroimaging data, abnormal structural findings were observed more frequently than normal findings (18.0% for CT scan and 21.6% for MRI).

Conclusions: The typical patient profile was an adult male with focal epilepsy of unknown etiology receiving monotherapy treatment. Although neuroimaging data were incomplete in many medical records, available results indicated a significant portion of structural abnormalities.

Keywords: epilepsy, characteristics, anti-epileptic drugs, neuroimaging

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Introduction

Epilepsy is a chronic neurological disorder characterized by a persistent predisposition to generate epileptic seizures and the associated neurobiological, cognitive, psychological, and social consequences. Globally, epilepsy affects approximately 70 million individuals, with an estimated annual incidence of five million new cases. In

Indonesia, the prevalence of epilepsy is estimated at approximately 8.2 per 1,000 population.[1-5]

Despite its global prevalence, the distribution of epilepsy is unequal, with up to 80% of affected individuals residing in low- and middle-income countries. Although around 70% of epilepsy patients can achieve seizure control with adequate Anti-Epileptic Drug (AED) therapy, many patients in these regions do not receive adequate treatment due to limited healthcare access, socioeconomic barriers, and insufficient diagnostic resources.[1,2]

Previous descriptive studies on epilepsy patients in Indonesia have demonstrated considerable variation in demographic and clinical characteristics. Some studies reported a higher prevalence among adults, while others identified children as the most affected group. Furthermore, inconsistencies exist in the reported distribution of seizure types and etiologies. Importantly, several prior studies did not include comprehensive data on key diagnostic variables, such as epilepsy syndrome classification and neuroimaging findings from Electroencephalography (EEG), Computed Tomography (CT) scan, and Magnetic Resonance Imaging (MRI).

Currently, limited data are available regarding the specific characteristics of epilepsy patients in the Tangerang region. Therefore, this study aimed to describe the demographic and clinical characteristics of epilepsy patients, including age, sex, seizure type, epilepsy type, epilepsy syndrome, etiology, treatment regimen, and neurodiagnostic findings, at the Neurology Outpatient Clinic of Siloam Hospital Lippo Village between 2022 and 2024.

Materials and Methods

Study Design and Setting

This study was a retrospective descriptive cross-sectional study conducted at the Neurology Outpatient Clinic of Siloam Hospital Lippo Village. Data collection was performed between March and April 2025 using secondary data obtained from medical records of epilepsy patients treated between January 2022 and December 2024.

Study Population and Sample

The target population consisted of all epilepsy patients receiving treatment at the hospital. The accessible population included epilepsy patients registered at the Neurology Outpatient Clinic of Siloam Hospital Lippo Village during the study period. The sampling method used was non-probability convenience sampling. The minimum required sample size was calculated as 96 subjects (n=96), utilizing the formula $n = \frac{Z\alpha^2 pq}{d^2}$ with a 95% confidence level ($Z\alpha$=1.96), proportion (p =0.5) and precision (d=0.1). A total of 111 medical records met the inclusion criteria after screening 206 records.

Inclusion Criteria

1. Patients registered at the Siloam Hospital Lippo Village Neurology Outpatient Clinic between 2022–2024.
2. Patients diagnosed with epilepsy by a neurologist.

Exclusion Criteria

Patients whose medical records lacked complete data on age, sex, seizure type, epilepsy type, epilepsy syndrome, etiology, AED regimen, AED(s) prescribed and at least one of the essential diagnostic tests (EEG, CT scan, or MRI).

Data Collection

Data were collected using a standardized case report form (CRF) designed to record patient characteristics from medical records. The variables collected included age, sex, seizure type, epilepsy type, epilepsy syndrome, etiology, treatment regimen, prescribed Anti-Epileptic Drugs (AEDs), and results of diagnostic examinations, including EEG, CT scan, and MRI.

Table 1. Operational Definitions of Variable.[4,18-24]

Operational Definitions
Age
Age was categorized into three groups based on commonly used clinical classifications: • Children, 0-17 years • Adults, 18-59 years • Elderly, 60 years and above
Sex
Sex was categorized as male or female based on medical record documentation.
Seizure Type
Seizure types were classified according to standard epilepsy classification guidelines into: • Focal seizures • Generalized seizures • Unknown onset seizures
Epilepsy Type
Epilepsy type was categorized based on clinical diagnosis recorded by the neurologist into: • Focal epilepsy • Generalized epilepsy • Unknown onset epilepsy
Epilepsy Syndrome
Epilepsy syndrome was classified according to clinical diagnosis documented in the medical record.
Etiology
Etiology was categorized based on available clinical and diagnostic information into: • Structural • Genetic • Infectious • Metabolic • Immune • Unknown causes
Treatment Regimen
Treatment regimen was classified into: • monotherapy (single AED) • polytherapy (two or more AEDs).
EEG Findings
EEG findings were categorized into: • Normal • Abnormal without epileptiform discharges • Abnormal with epileptiform discharges
Neuroimaging Findings
Neuroimaging findings from CT scan and MRI were categorized into: • Normal • Abnormal structural findings • No data available

Data Analysis

Data processing was performed using Microsoft Excel and statistical analysis was conducted using SPSS 2022 software (Statistical Package for the Social Sciences). Data processing was performed using Microsoft Excel, and statistical analysis was conducted using SPSS software. Since this study was descriptive in nature, data were analyzed using univariate statistical

methods and presented as frequencies and percentages.

Ethical Consideration

Ethical approval for this study (No. 308/K-I.KJ/ETIK/II/2024) was obtained from the Ethics Committee of the Faculty of Medicine, Universitas Pelita Harapan, prior to data collection.

Results

Study Population

The data collection process was conducted from March to April 2025. Out of the 206 medical records of epilepsy patients identified, 95 records were excluded due to incomplete data regarding key variables (age, sex, seizure type, epilepsy type, syndrome, etiology, AED regimen, AED(s) prescribed and at least one neuroimaging result). Consequently, a total of 111 medical records were included in the final analysis.

Patient Demographics and Clinical Characteristics

The initial univariate analysis revealed the demographic and clinical profile of the subjects [Table 1].

Table 2. Characteristic of Epilepsy Patients.

Variable	Frequency (n)	Proportion (%)
Age		
Children	30	27,0
Adults	77	69,4
Elderly	4	3,6
Sex		
Male	62	55,9
Female	49	44,1
Seizure Type		
Focal	59	53,2
Generalized	47	42,3
Unknown onset	5	4,5
Epilepsy Type		
Focal	59	53,2
Generalized	47	42,3
Focal to Generalized	-	-
Unknown onset	5	4,5
Epilepsy Syndrome		
Temporal Lobe	24	21,6
Frontal Lobe	9	8,1
Parietal Lobe	1	0,9
Occipital Lobe	-	-
Benign Epilepsy with Centrotemporal Spikes (BECTS)	2	1,8
Absence	10	9,0
None	65	58,6
Etiology		
Structural	31	27,9
Genetic	-	-
Infection	8	7,2
Metabolic	-	-
Immune	-	-
Unknown	72	64,9
AED Regimen		
Monotherapy	72	64,9
Polytherapy	39	35,1
AED(s) Prescribed		
Carbamazepine	14	12,6
Clobazam	12	10,8
Clonazepam	5	4,5
Ethosuximide	-	-
Gabapentin	4	3,6
Lamotrigine	6	5,4
Levetiracetam	5	4,5
Oxcarbazepine	-	-
Phenytoin	58	52,3
Phenobarbital	3	2,7
Topiramate	3	2,7
Valproic Acid	53	47,7
Zonisamide	-	-
EEG Findings		
Normal	55	49,5
Abnormal without epileptiform discharges	21	18,9

Abnormal with epileptiform discharges	35	31,5
CT Scan Findings		
Normal	5	4,5
Abnormal	20	18,0
No data	86	77,5
MRI Findings		
Normal	11	9,9
Abnormal	24	21,6
No data	76	68,5

Age Distribution

Regarding age distribution, the majority of subjects belonged to the adult group (77 subjects, 69.4%), followed by the children's group (30 subjects, 27.0%) and the elderly group (4 subjects, 3.6%). The sex distribution showed a slight male predominance, with 62 male subjects (55.9%) and 49 female subjects (44.1%).

Seizure Classification and Etiology

The most frequent seizure type recorded was focal seizures, observed in 59 subjects (53.2%), while generalized seizures were found in 47 subjects (42.3%). This pattern was mirrored in the epilepsy classification, with focal epilepsy being the most common type (59 subjects, 53.2%), followed by generalized epilepsy (47 subjects, 42.3%). No cases of focal to generalized epilepsy were recorded.

Analysis of epilepsy syndromes indicated that the majority of patients (65 subjects, 58.6%) did not receive a specific syndromic diagnosis. Among those with a syndromic diagnosis, Temporal Lobe Syndrome was the most common (24 subjects, 21.6%).

Regarding etiology, unknown or idiopathic etiology was the most frequent, present in 72 subjects (64.9%). Structural etiologies were identified in 31 subjects (27.9%) and infection-related etiologies in 8 subjects (7.2%). Genetic, metabolic and immune etiologies were not recorded in this sample.

Treatment and Diagnostic Findings

The majority of subjects received monotherapy (72 subjects, 64.9%), while 39 subjects (35.1%) received polytherapy. The most commonly prescribed Anti-Epileptic Drugs (AEDs) were Phenytoin (58 subjects, 52.3%) and Valproic Acid (53 subjects, 47.7%).

Neurodiagnostic findings showed:

1. EEG Results: The proportion of subjects with normal EEG findings was 55 (49.5%). Abnormal findings were split between those showing epileptiform discharges (35 subjects, 31.5%) and those with non-epileptiform abnormalities (21 subjects, 18.9%).
2. Neuroimaging Data: A significant portion of the sample lacked neuroimaging data (CT scan: 77.5% missing; MRI: 68.5% missing). However, among the available data, abnormal structural findings were more frequent than normal findings (Abnormal CT scan: 18.0%; Abnormal MRI: 21.6%).

Cross-Tabulation Results

Cross-tabulation between Epilepsy Type and EEG Findings [Table 2] showed that among focal epilepsy patients, 40.7% had abnormal EEG with epileptiform discharges, while 32.2% had normal EEG results. For generalized epilepsy patients, 66.0% had normal EEG results. Patients

with unknown onset epilepsy universally showed normal EEG findings (100%).

Table 3. Epilepsy Type and EEG Findings.

Var	EEG Findings (%)			
	Abnormal without epileptiform discharges	Abnormal without epileptiform discharges	Normal	**Total (%)**
Epilepsy Type (%)				
Focal	24 (40,7%)	16 (27,1%)	19 (32,2%)	59 (100%)
Generalized	11 (23,4%)	5 (10,9%)	31 (66,0%)	47 (100%)
Focal to generalized	-	-	-	-
Unknown onset	-	-	5 (100%)	5 (100%)
Total (%)	35 (31,5%)	21 (18,9%)	55 (49,5%)	111 (100%)

The cross-tabulation of Epilepsy Type and AED Regimen [Table 3] demonstrated that monotherapy was dominant across all epilepsy types: 72.3% for generalized epilepsy, 55.9% for focal epilepsy and 100% for unknown onset epilepsy.

Table 4. Epilepsy type and AED Regimen.

Var	AED Regimen		
	Mono therapy (%)	**Poly therapy (%)**	**Total (%)**
Epilepsy type (%)			
Focal	33 (55,9%)	26 (44,1%)	59 (100%)
Generalized	34 (72,3%)	13 (27,7%)	47 (100%)
Focal to generalized	-	-	-
Unknown onset	5 (100%)	-	5 (100%)
Total (%)	72 (64,9%)	39 (35,1%)	111 (100%)

Discussion

This study aimed to describe the demographic and clinical characteristics of epilepsy patients attending the Neurology Outpatient Clinic of Siloam Hospital Lippo Village. The analysis of 111 medical records revealed several key epidemiological and clinical patterns, many of which align with, while others contrast with, existing regional and international literature.

Patient Demographics and Seizure Profile

The study found that the majority of patients were adults (69.4%) and male (55.9%). The finding regarding sex is consistent with previous studies by Maryam and Saraswati in Indonesia, which also reported a male predominance (55.7% and 51.0%, respectively), suggesting a minor demographic trend in the Indonesian population. However, the prevalence amongst adults contrasts with Saraswati's finding, where children (57.0%) were the most affected group. This difference may reflect a selection bias, as the current study focuses solely on a hospital outpatient clinic which often sees more stable adult patients requiring long-term follow-up rather than acute pediatric cases typically managed through dedicated pediatric or emergency services.

Regarding seizure classification, focal seizures were the most frequent type, accounting for 53.2% of cases. This is a significant deviation from several other Indonesian studies by Maryam and Saraswati, as well as an Indian study by Panagariya, all of which reported generalized seizures as the most common type (47.1% to 75.0% prevalence). The high rate of focal epilepsy in our study may be attributed to a more detailed and accurate diagnostic work-up available at the urban tertiary outpatient clinic setting, which includes access to better neuroimaging

(MRI/CT scan) and EEG, facilitating the differentiation of subtle focal onset seizures often misclassified as generalized in settings with limited resources.

Etiology and Treatment Regimen

The most frequent etiology identified was idiopathic/unknown (64.9%), followed by structural etiology (27.9%). This finding is consistent with Saraswati's research (65.8% idiopathic) but sharply contrasts with Maryam's findings, where the majority of cases were symptomatic (84.3%). The high idiopathic rate in our study suggests that even with adequate clinical tools, the precise underlying cause remains elusive for most patients, or it may reflect incomplete documentation regarding subtle genetic or metabolic factors.

Monotherapy was the dominant treatment approach (64.9%), which aligns with the global clinical guidelines (PERDOSSI) emphasizing starting treatment with a single Anti-Epileptic Drug (AED) at the lowest effective dose to minimize side effects. The two most frequently used AEDs were Phenytoin (52.3%) and Valproic Acid (47.7%), consistent with Maryam's study where Phenytoin was also the most utilized drug. This high usage of older-generation AEDs suggests that these drugs remain highly effective, cost-efficient and widely prescribed in this specific clinic setting.[4]

Diagnostic Findings (EEG and Neuroimaging)

The study included detailed findings on diagnostic procedures, a variable often lacking in previous local descriptive studies. The EEG results were almost equally distributed between normal (49.5%) and abnormal findings (50.4%). Furthermore, the cross-tabulation showed that 66.0% of patients with generalized epilepsy still presented with a normal EEG. This highlights that a normal EEG does not definitively exclude an epilepsy diagnosis, especially in the context of clinical certainty, as per PERDOSSI guidelines.[4]

Crucially, a high percentage of medical records lacked neuroimaging data (77.5% for CT scan, 68.5% for MRI). However, among the records where imaging was available, structural abnormalities were frequently observed (18.0% for CT scan, 21.6% for MRI). This strong presence of structural findings in available data underscores the clinical importance of neuroimaging, particularly MRI, in identifying underlying structural etiologies. The lack of data in most records suggests a need for standardized protocols to ensure complete documentation and comprehensive diagnostic work-up, especially in non-emergency settings.

Conclusion and Future Directions

In summary, the most frequent patient profile was male adults, focal epilepsy, unknown etiology, monotherapy AED regimen and using Phenytoin. This study provides valuable epidemiological data for the Tangerang area and highlights the clinical trend toward focal epilepsy when supported by comprehensive diagnostic input.

Future research should focus on analytic studies to explore associations between specific neuroimaging findings (e.g., mesial temporal sclerosis) and clinical

characteristics, particularly in patients with focal epilepsy. Furthermore, an audit of the data completion rate for neuroimaging is warranted to improve documentation standards and ensure comprehensive patient care.

Conclusion

Based on the data analysis regarding the characteristics of epilepsy patients at the Neurology Outpatient Clinic of Siloam Hospital Lippo Village between 2022 and 2024, the following conclusions were drawn:

1. The largest proportion of epilepsy patients fell into the adult age group (69.4%), with a slight predominance of males (55.9%).
2. The most frequent seizure type and epilepsy type was focal epilepsy (53.2%).
3. The most frequently identified epilepsy syndrome was temporal lobe syndrome (21.6%).
4. The most common etiology found was idiopathic/unknown (64.9%), followed by structural etiology (27.9%).
5. Monotherapy (64.9%) was the dominant treatment approach, with Phenytoin (52.3%) and Valproic Acid (47.7%) being the most frequently prescribed Anti-Epileptic Drugs (AEDs).
6. Regarding supporting diagnostics, EEG results showed a near-equal distribution between normal (49.5%) and abnormal findings (50.4%). Furthermore, where neuroimaging data was available, structural abnormalities were observed in 18.0% of CT scans and 21.6% of MRI scans.

Conflict of Interest

The authors declared no conflict of interest related to the research, analysis, writing, or publication of this paper.

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Ethical Clearance

This study involved the use of human data (secondary medical records). A statement on ethics approval and consent was obtained prior to data collection. The study protocol was reviewed and approved

by the Ethics Committee of the Faculty of Medicine, Pelita Harapan University. The ethical reference number for this approval is No. 308/K-I.KJ/ETIK/II/2024. Given the retrospective nature of this study using anonymized secondary data, informed consent from individual patients was waived by the committee.

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