

Therapeutic and Prognostic Aspects of Vascular Epilepsy in Neurology Departments: A 4-Year Descriptive Study Conducted at the Treichville University Hospital and a Private Medical Center in Abidjan

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Abstract

Introduction: Vascular epilepsy, defined as the recurrence of epileptic seizures following a stroke, is the leading cause of late-onset epilepsy in adults. In sub-Saharan Africa, its incidence is rising in parallel with that of cardiovascular diseases, posing a major therapeutic challenge. **Objective:** To analyze the therapeutic aspects and clinical course of vascular epilepsy at Treichville University Hospital and at a private medical center in Abidjan (Ivory Coast). **Materials and Methods:** This is a retrospective descriptive study conducted over a 4-year period from January 2022 to December 2025 at Treichville University Hospital and a private medical center in Abidjan. The study examined the medical records of patients followed for vascular epilepsy. Patients with acute symptomatic seizures (seizures occurring within the first 7 days following a stroke and not persisting beyond 7 days) were excluded, as were incomplete records that did not allow for a definitive diagnosis of vascular epilepsy. Data collection and analysis were performed using the KoboToolbox application. Quantitative variables (age) were expressed as means and standard deviations, and other qualitative variables as frequencies and percentages. Verbal consent was obtained from patients or their families, guaranteeing anonymity and confidentiality. **Results:** A total of 53 patients were included, including 31 patients at Treichville University Hospital. The mean age was 58.45 years $\pm$ 14.03 years, with a predominance of males (male-to-female ratio of 1.65). Ischemic stroke

accounted for 83.02% of cases ($n = 44$) and hemorrhagic stroke for 16.98% ($n = 9$). The strokes presented with a focal onset in 71% of cases ($n = 38$). The most frequently prescribed antiepileptic drugs were levetiracetam (28.30%, $n = 15$), sodium valproate (16.98%, $n = 9$), carbamazepine (15.09%, $n = 8$), and phenobarbital (13.21%, $n = 7$). Therapeutic efficacy (defined as a >50% reduction in seizures for more than 6 months) was observed in 60.38% of patients ($n = 32$), and seizure remission (absence of seizures) in 62.26% ($n = 33$), of whom 36.36% ($n = 12$ out of 33) experienced remission lasting up to 24 months. Reported adverse effects included drowsiness (7.55%, $n = 4$) and psychiatric disorders (3.77%, $n = 2$). The persistence of seizures was mainly due to poor adherence (18.87%, $n = 10$), loss to follow-up (7.54%, $n = 4$), and the high cost of treatment (3.77%, $n = 2$), with some patients having multiple overlapping causes. **Conclusion:** The management of vascular epilepsy in Abidjan illustrates a therapeutic transition marked by the emergence of new-generation medications (levetiracetam) alongside conventional treatments. Although overall efficacy is satisfactory, non-adherence and financial cost remain the main obstacles to long-term seizure control.

Keywords

Vascular Epilepsy, Stroke, Levetiracetam, Antiepileptic Treatment, Ivory Coast

1. Introduction

Vascular epilepsy is characterized by the recurrence of epileptic seizures following a stroke [1].

In developed countries, early and appropriate management results in a high rate of seizure control [2].

Across the African continent, the incidence of this condition is rising in parallel with the epidemiological transition and the increase in cardiovascular diseases [3] [4]; reducing the burden of the disease requires greater availability of effective antiepileptic treatments in the face of significant barriers to access [2]. In West Africa, the management of post-stroke epilepsy requires striking a balance between seizure control, tolerance of drug interactions, and affordability [3] [5].

In Côte d'Ivoire, data on the management of vascular epilepsy are insufficient. It is against this backdrop that the present study was conducted, with the objective of analyzing the therapeutic and clinical aspects of vascular epilepsy at the Treichville University Hospital and at a private medical center in Abidjan, with a view to contributing to the improvement of its management.

2. Materials and Methods

This retrospective descriptive study was conducted over a four-year period, from January 2022 to December 2025, within the neurology department of the Treich-

ville University Hospital and the epilepsy clinic of a private medical center in Abidjan.

2.1. Selection Criteria and Case Distribution

Medical records of patients diagnosed with vascular epilepsy were included. Specifically, the study included patients who experienced unprovoked epileptic seizures occurring or persisting for more than 7 days after a stroke.

Exclusion criteria: patients with acute symptomatic seizures (seizures occurring within the first 7 days following a stroke and not persisting beyond 7 days) and those whose incomplete medical records did not allow for a definitive diagnosis of vascular epilepsy.

2.2. Definitions of Outcome Measures

- **Seizure remission:** defined as the complete absence of seizures based on medical record data (date of the last seizure).
- **Treatment efficacy:** defined as a reduction in seizure frequency of more than 50% maintained for more than 6 months.

2.3. Data Collection and Analysis

Data were collected using KoboToolbox via its KoboCollect application. Quantitative data (age) were expressed as means and standard deviations, while qualitative data (occupation, seizure type, stroke type, type of antiepileptic treatment, adverse effects, treatment efficacy, seizure remission, seizure-free duration, and reasons for persistent seizures) were expressed as frequencies and percentages. Data were collected after obtaining verbal consent from patients or a family member, ensuring absolute anonymity and confidentiality.

3. Results

This study included 53 patients, 31 of whom were at Treichville University Hospital. Men accounted for 62.3% of the patients, with a male-to-female ratio of 1.65. The mean age of the patients was 58.45 years $\pm$ 14.03 years. Ischemic and hemorrhagic strokes accounted for 83.02% and 16.98% of cases, respectively. Strokes with focal onset accounted for 71% of cases. Treatment characteristics are presented in **Table 1**. Clinical course characteristics are presented in **Table 2**.

Table 1. Summary table of patients' treatment characteristics.

Variables		Patients (n = 53)
Type of treatment, n (%)	Levetiracetam	15 (28.3%)
	Sodium valproate	9 (16.98%)
	Carbamazepine	8 (15.09%)
	Phenobarbital	7 (13.21%)
	Lamotrigine	1 (1.89%)

Continued

	Pregabalin	1 (1.89%)
	None	4 (7.55%)
	Undetermined	8 (15.09%)
Adverse effects, n (%)	Drowsiness	4 (7.55%)
	Psychiatric disorders	2 (3.77%)
Treatment efficacy, n (%)	Yes	32 (60.38%)
	No	15 (28.3%)
	Undetermined	6 (11.32%)

Table 2. Summary table of patients' clinical characteristics.

Variables	Patients (n = 53)	
Remission of seizures, n (%)	Yes	33 (62.26%)
	No	4 (12.12%)
	Undetermined	3 (5.66%)
Seizure-free duration, n (%)*	<1 month	2 (6.06%)
	[1 - 3] months	4 (7.55%)
	[3 - 6] months	5 (15.15%)
	[6 - 12] months	5 (15.15%)
	[12 - 24] months	5 (15.15%)
	>24 months	12 (36.36%)
Causes of persistent seizures, n (%)	Poor adherence to treatment	10 (18.87%)
	Loss to follow-up	4 (7.54%)
	High cost of treatment	2 (3.77%)
	Anxiety	1 (1.89%)
	Under-dosed treatment	1 (1.89%)

*Seizure-free duration was assessed in patients in remission (33 patients). Note: The total number of reasons cited to explain persistence reflects the multiple contributing factors identified in patients who were not in remission.

4. Discussion

4.1. Type of Treatment

The most commonly used treatments in our study were levetiracetam, sodium valproate, carbamazepine, and phenobarbital, at 28.3%, 16.98%, 15.09%, and 13.21%, respectively. This distribution of antiepileptic drugs reflected a therapeutic transition in West Africa, balancing the rise of newer-generation medications with the continued use of older treatments.

Indeed, the predominance of levetiracetam was consistent with the results of stud-

ies conducted in Senegal and Nigeria [4] [5], which had highlighted a growing adoption of newer medications in urban areas of West Africa among the elderly and patients with vascular diseases. Levetiracetam's lack of enzyme induction prevents any interaction with antithrombotic and antihypertensive agents. However, its clinical use requires caution; in our series, observed adverse effects included drowsiness in 7.55% of patients and psychiatric disorders in 3.77%. Neuropsychiatric disorders were also reported in the West African cohort by Ogunjimi *et al.* as well as in the international SANAD II trial [6].

Sodium valproate has retained an important role due to its broad-spectrum efficacy, but regional data from West Africa and the EURAP registry [7] have highlighted its metabolic and teratogenic limitations in women, as well as the risks of bleeding interactions with post-stroke antiplatelet agents.

As for carbamazepine and phenobarbital, their frequent use in our series reflected prescribing practices in West Africa [4] [5]. In Benin, the study by Adoukonou *et al.* on the follow-up of stroke patients showed that, while carbamazepine is effective for focal seizures of vascular origin, its cost and interactions with cytochromes complicate the management of cardiovascular comorbidities. For its part, phenobarbital—promoted by the WHO's mhGAP program in sub-Saharan Africa—ensures immediate affordability but exacerbates sedation and cognitive decline in patients with cerebrovascular diseases.

4.2. Therapeutic Outcomes

In terms of long-term outcomes, the overall response rate of 60.38% and prolonged remission (>24 months) in 36.36% of patients (n = 12) were comparable to the rates of post-stroke seizure control reported in clinical series in sub-Saharan Africa [4]. Nevertheless, reasons for persistent seizures included poor adherence (18.87%, n = 10), loss to follow-up (7.54%, n = 4), financial cost (3.77%, n = 2), anxiety (1.89%, n = 1), and underdosing (1.89%, n = 1). These factors contributing to treatment failure echo the findings of Adoukonou *et al.* in Benin and Ogunjimi *et al.* in Nigeria, who identified financial barriers, the lack of long-term follow-up, and the lack of therapeutic education as the main causes of the subregional treatment “gap” [3] [5].

Finally, the study by Jost *et al.* [8] on the quality of antiepileptic drugs in West Africa (Togo) highlighted that thermal degradation and the instability of generic drugs in tropical climates constitute an additional factor explaining the persistence of seizures, regardless of patient adherence.

This local clinical experience thus reflects the realities of West Africa, where the safety of modern medications is pitted against socioeconomic barriers to adherence to conventional treatments.

5. Conclusion

Our study highlighted a therapeutic transition characterized by the rise of levetiracetam alongside traditional treatments. However, despite satisfactory overall

efficacy, long-term control remains hampered by non-adherence, financial costs, and patients lost to follow-up. Optimizing care requires facilitating access to safe and newer medications, as well as strengthening patient education.

Author Contributions

Broh NYC, Kouassi KL, Soro D, Abbé AS, Essoin-De Souza TN, Beuseize AMR, Yéo NS, and Diakité I: Data collection and analysis, bibliographic research, and writing. Doumbia-Ouattara M: Critical reading and approval of the final version.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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