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Original Research Article

Oral Hygiene Status and Gingival Among Persons Living with Epilepsy: A Case-Control Study-Cameroon

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Abstract: ***Background*:** Persons living with epilepsy (PWE) may present with poorer oral health outcomes compared to the general population, partly due to the effects of anti-seizure medications (ASM) and challenges related to oral hygiene practices. Gingival enlargement resulting from medication poses a clinically significant threat to oral health and treatment adherence. This study aims; to determine the prevalence of gingival enlargement among PWE compared with healthy controls, to evaluate periodontal status and oral hygiene practices, and to identify factors associated with gingival enlargement. ***Materials and Methods*:** We conducted a hospital-based case-control study at Yaoundé Central Hospital and Yaoundé General Hospital, Cameroon. Thirty-five PWE receiving ASM were enrolled and matched by age and sex with 35 healthy controls. Gingival enlargement (MB index), calculus index, plaque index, and gingival bleeding index were tools utilized in oral hygiene status assessment. A structured questionnaire was developed to aid in the collection of data on oral hygiene practices and ASM regimens. Bivariate and multivariate analyses permitted the identification of associations between gingival enlargement and clinical variables. ***Results*:** Seventy participants were included in the study (mean age 32.44±11.43 years; 64% male). Out of the 70 participants, 10.0% of participants had gingival enlargement, with an increased frequency among PWE compared with controls (17.1% vs 2.9%, p=0.046). All cases were classified as grade 1 enlargement. PWE had a significantly worse periodontal status, as evidenced by a higher plaque index (p=0.009), gingival bleeding index (p=0.003), calculus index (p=0.027), as well as a worse overall oral hygiene status (p=0.012). Gingival enlargement occurred exclusively among participants with the highest plaque index scores and was significantly associated with periodontal indices (p<0.001). No statistically significant associations were observed between gingival enlargement and ASM regimen type, daily drug dose, or treatment duration, although all affected participants were receiving carbamazepine-containing regimens. ***Conclusion*:** Gingival enlargement in PWE appears to reflect an interaction between periodontal inflammation and ASM exposure rather than pharmacological factors alone. Poor periodontal status may represent an important modifiable risk factor. Integration of oral health evaluation into routine neurological care, alongside reinforcement of preventive oral hygiene practices and interdisciplinary collaboration, may help reduce oral complications.

Keywords: Epilepsy, Gingival Enlargement, Anti-Seizure Medications, Periodontal Disease, Oral Hygiene, Cameroon.

INTRODUCTION

Epilepsy is a chronic neurological disorder characterized by recurrent epileptic seizures and associated neurobiological, cognitive, psychological, and social consequences [1]. It remains one of the most common neurological non-communicable conditions worldwide, affecting approximately 50 million people [3]. The burden is disproportionately higher in low- and middle-income countries, where preventable causes,

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delayed diagnosis, stigma, and limited access to effective treatment contribute to a large treatment gap [3]. In Europe, reported prevalence estimates of active epilepsy range from 5.57 to 7.30 per 1000 inhabitants, while lifetime epilepsy ranges from 6.17 to 9.38 per 1000 [13]. In sub-Saharan Africa, prevalence estimates are consistently higher, with active epilepsy reported at 8.0–9.9 per 1000 and lifetime epilepsy at 12.3–19.7 per 1000 [5]. In Cameroon, prevalence varies widely (5.5–136 per 1000 inhabitants), reflecting heterogeneity in study populations and methods [7]. Geographical variations influence incidence data, with yearly incidence estimates of 50.75 –74.38 per 100,000 in Europe and about 81.7 per 100,000 in sub-Saharan Africa [6-13].

Anti-seizure medications (ASM) form the basis of epilepsy management, with the main aim of improving quality of life by ensuring seizure control while minimizing drug toxicity [19]. Approximately two-thirds of persons living with epilepsy can become seizure-free with ASM therapy, and about half may achieve seizure freedom with the first ASM, often at low-to-moderate doses [19-21]. Treatment is typically initiated as monotherapy with gradual dose titration to the lowest effective maintenance dose; polytherapy is generally considered after failure of sequential monotherapies, although it may be introduced earlier when prognostic indicators suggest difficult-to-treat epilepsy [19–21]. In routine practice, therefore, long-term ASM exposure is common, making medication-related adverse effects clinically relevant.

Oral health is increasingly recognized as an important yet frequently neglected dimension of chronic neurological care. Across multiple aspects of oral health and dental status, persons living with epilepsy tend to have worse outcomes than non-epileptic populations, including poorer periodontal indices, higher levels of dental wear and tooth loss, and fewer restored or replaced teeth [41, 42]. Worse oral health outcomes were associated with poorly controlled epilepsy, with a remarkably higher incidence of generalized tonic-clonic seizures, as compared to better-controlled disease. This may be attributed to a constellation of seizure-related trauma, functional deficits, and lack of attention to routine oral care [41]. Despite seizure-related mechanisms, ASM-related adverse effects also compromise oral health and periodontal status.

Among oral complications potentially linked to ASM therapy, gingival enlargement is particularly important. Gingival enlargement is defined as abnormal overgrowth of periodontal tissues and may cause clinically significant morbidity, including pain, tenderness, bleeding, speech disturbance, malocclusion, abnormal tooth movement, enhanced caries development, and periodontal complications [46]. Phenytoin-associated gingival enlargement is a well-described adverse effect, with reported incidence ranging from 16% to 94%, and approximately half of patients on long-term phenytoin therapy developing clinically significant enlargement [9-55]. Although phenytoin is most strongly implicated, gingival enlargement has also been reported with other ASM, including valproic acid and phenobarbital, though prevalence estimates are less well characterized [11–58]. Clinically, gingival enlargement may become apparent within months after treatment initiation and often begins at interdental papillae, with a predilection for the labial gingiva of anterior teeth [60]. The expression and severity of gingival enlargement are thought to be influenced by interacting factors such as drug-related variables, plaque-induced inflammatory changes, and host susceptibility, including genetically determined fibroblast responsiveness; however, the relationships between severity and dose, duration, or drug concentrations remain inconsistent across reports [53].

Despite the likely clinical and quality-of-life implications, factors associated with gingival enlargement and oral hygiene status among persons living with epilepsy have not been previously assessed in Cameroon [7]. Local evidence is needed to inform integrated neuro-dental care approaches, particularly within settings where barriers to oral healthcare access and epilepsy-related stigma may compound risk. Therefore, this study aimed to determine the prevalence of gingival enlargement and to assess oral hygiene status among persons living with epilepsy receiving ASM therapy compared with age- and sex-matched healthy controls, as well as to identify factors associated with gingival enlargement in the Cameroonian context.

METHODS

Study Design and Setting

We conducted a hospital-based case–control study between February and May 2021 at the neurology departments of Yaoundé Central Hospital and Yaoundé General Hospital, two tertiary referral centers providing specialized neurological care in Yaoundé, Cameroon. The study aimed to evaluate gingival enlargement and oral hygiene status among persons living with epilepsy receiving anti-seizure medications compared with age- and sex-matched healthy controls.

Participant Recruitment and Data Collection

Participants were recruited consecutively during routine neurology consultations. Eligible cases consisted of persons living with epilepsy diagnosed by a physician according to International League against Epilepsy (ILAE) criteria and receiving anti-seizure medication therapy for at least one month. Controls were healthy individuals matched for age and sex, recruited from the general population accompanying patients or attending outpatient services

Participants were included based on the eligibility criteria. The latter included participants who provided informed consent, those without a history of dental scaling within the previous six months.

Individuals receiving medications known to affect periodontal tissues or presenting with cormobidities capable of altering periodontal status were excluded.

Data collection entailed administration of a structured questionnaire and conducting a standardized oral examination. The questionnaire included socio-demographic information, medical history, use of anti-seizure medication (including drug combinations, daily dosage, and duration of therapy), and oral hygiene practices. Oral examinations were conducted with the help of a periodontal probe and a dental mirror under standardized clinical conditions.

Estimation of the sample size was based on standard formulas for case–control studies. Measurements utilized gingival enlargement prevalence of 64% among exposed participants and 4% among controls, with 80% statistical power and a 5% level of significance.

Study Instruments

Assessment of Gingival Enlargement

Gingival enlargement was assessed using the Miranda-Brunet index, which evaluates horizontal gingival overgrowth. Measurements were obtained using a UNC-15 periodontal probe positioned in the buccolingual direction at interdental papillae. The increase in papillary thickness was measured from the enamel surface at the interdental contact point to the external papillary surface. Gingival enlargement was stratified into three grades: grade 0 (papillary thickness <1 mm), grade 1 (1–2 mm), and grade 2 (>2 mm). This standardized approach allowed for objective quantification of gingival enlargement among participants.

Gingival Inflammation

Gingival inflammation was assessed using the Gingival Index described by Löe and Silness. This index assesses tissue inflammation and bleeding response on probing and is scored from 0 to 3, representing absence of inflammation, mild inflammation without bleeding, moderate inflammation with bleeding on probing, and severe inflammation, respectively.

Dental Plaque Accumulation

Plaque levels were assessed using the Plaque Index (Silness and Löe), which is based on the thickness of plaque deposits at the gingival margin, not the total surface coverage. Each tooth surface was scored on a scale from 0 (absence of plaque) to 3 (abundant plaque accumulation), and mean scores were calculated to classify oral hygiene status.

Oral Hygiene Status

The Simplified Oral Hygiene Index (OHI-S) proposed by Greene and Vermillion was used to evaluate overall oral hygiene. This composite index includes a Debris Index Simplified (DI-S) and Calculus Index Simplified (CI-S), assessing soft debris and calculus accumulation on tooth surfaces. Summation of scores from both indexes derived a global oral hygiene score categorized as good, fair, or poor according to established thresholds.

Data Analysis

Data were analyzed using SPSS Statistics version 26.0. Continuous variables were summarized using means and compared between groups using Student's t-test. Categorical variables were expressed as frequencies and percentages and compared using chi-square tests. Associations between gingival enlargement and potential risk factors were evaluated using odds ratios with 95% confidence intervals. All tests were two-sided, and statistical significance was defined as $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of the Faculty of Medicine and Biomedical Sciences, University of Yaoundé I. Administrative authorization was granted by the participating hospitals. All participants provided written informed consent prior to inclusion, and collected data were handled confidentially in accordance with ethical research standards.

RESULTS

Participant Recruitment and Study Population

A total of 70 participants were included in the study, comprising 35 persons living with epilepsy (cases) receiving anti-seizure medications and 35 age- and sex-matched healthy controls. Participants were recruited from the neurology departments and dental clinics of Yaoundé Central Hospital and Yaoundé General Hospital. Among 75 eligible persons living with epilepsy initially screened, 40 were excluded due to comorbidities (n=10), refusal to participate (n=25), or anti-seizure medication use for less than one month (n=5). Among 50 potential controls screened, 15 were excluded due to comorbidities (n=5) or recent dental scaling within six months (n=10). The final study population, therefore, consisted of 70 participants.

Socio-Demographic Characteristics

The socio-demographic characteristics of cases and controls are summarized in Table 1. The average age of the overall study population was 32.44 ± 11.43 years, with comparable mean ages between cases (32.43 ± 11.43 years) and controls (32.46 ± 11.43 years), signifying successful age matching (p=0.224). Most participants were males (64%), corresponding to a male-to-female ratio of 1.78, with no significant difference in sex distribution between groups (p=0.803). Marital status was also comparable between cases and controls (p=0.601).

Educational level differed significantly between groups (p<0.001), with a higher proportion of university-level education among controls compared with cases.

Profession did not differ significantly between groups (p=0.071).

Table 1: Sociodemographic characteristics of study participants

	Variable	Cases	Controls	P value
Age	18-28	17	23	0.224
	29-45	13	7	
	46-62	3	1	
	63-80	2	4	
Sex	Male	22	23	0.803
	Female	13	12	
Matrimonial status	Married	8	8	0.601
	Single	27	26	
	Widow/widower	0	1	
Educational level	Non scolarised	2	0	<0.001
	Primary	8	4	
	Secondary	14	2	
	University	11	29	
Profession	Student	12	19	0.071
	Private sector	18	11	

Gingival Enlargement and Periodontal Findings

Gingival enlargement was observed in 7 participants (10.0%) overall. Out of the 7 participant, 6 were persons living with epilepsy (17.1%) and 1 a control participant, (2.9%), hence a statistically significant difference between groups (p=0.046). All observed cases of gingival enlargement were classified as grade 1. There were no participants presenting grade 2 enlargement.

Significant differences were observed in indexes between groups. Higher plague index scores were characteristic of cases. A larger proportion of cases presented with scores of 3 compared to controls (54.3% vs 20.0%, p=0.009). Gingival enlargement was observed exclusively among participants with plaque index score 3. Calculus index scores were similarly higher among cases (p=0.027). Gingival bleeding index differed significantly between groups, with higher scores among persons living with epilepsy (p=0.003).

Overall oral hygiene status was significantly poorer among cases compared to controls, with a higher proportion classified as having poor oral hygiene (71.4% vs 37.2%, p=0.012).

Table 2: Periodontal evaluation and oral hygiene status

Oral indices	Cases N (%)	Controls N (%)	P value
Gingival enlargement index			**0.046**
Score 0	29(82.9)	34(97.1)	
Score 1	6(17.1)	1(2.9)	
Score 2	0(0)	0(0)	
Plaque index			**0.009**
Score 1	9(25.7)	19(54.3)	
Score 2	7(20.0)	9(25.7)	
Score 3	19(54.3)	7(20.0)	
Calculus index			**0.027**
Score 1	10(28.6)	21(60.0)	
Score 2	14(40.0)	9(25.7)	
Score 3	11(31.4)	5(14.3)	
Gingival bleeding index			**0.003**
Score 0	14(40.0)	28 (80.0)	
Score 1	14(40.0)	6(17.1)	
Score 2	6(17.1)	0(0)	
Score 3	1(2.9)	1(2.9)	
Oral hygiene status			**0.012**
Good	7(20.0)	20(57.1)	
Fair	3(8.6)	2(5.7)	
Poor	25(71.4)	13(37.2)	

Oral Hygiene Practices and Dental Care Behavior

Oral hygiene practices were broadly comparable between groups in terms of brushing frequency (p=0.564), brushing timing (p=0.199), brushing complement used (p=0.242), and brushing technique (p=0.323). However, a significantly higher proportion of controls reported visiting a dentist compared with persons living with epilepsy (57.1% vs 17.2%, p=0.001). Frequency of dental visits did not differ significantly between groups (p=0.072). Notably, floss use was significantly lower among cases, with all participants in the epilepsy group reporting no floss use compared to controls (p=0.041).

Table 3: Oral hygiene practices in study population

	Variable	Cases N (%)	Controls N (%)	P value
Brushing per day	Ones	18(51.4)	17(48.6)	0.564
	Twice	16(45.7)	18(51.4)	
	Thrice	1(2.9)	0(0)	
Time of brushing	Before meals	17(48.6)	15(42.9)	0.199
	After meals	1(2.9)	6(17.1)	
	Before bed	0(0)	1(2.9)	
	Before and after meals	17(48.6)	13(37.1)	
Brushing complement	Toothpaste	32(91.4)	33(94.2)	0.242
	Salt	0(0)	1(2.9)	
	Bicarbonate	2(5.7)	1(2.9)	
	Soap	1(2.9)	0(0)	
	Charcoal	0(0)	0(0)	
Brushing technique	Poor	7(20.0)	3(8.6)	0.323
	Good	3(8.6)	5(14.3)	
	Satisfactory	25(71.4)	27(77.1)	
Visit to dentist	Yes	6(17.2)	20(57.1)	**0.001**
	No	28(82.8)	15(42.9)	
Frequency of visit to dentist	Annually	4(11.5)	18(51.4)	0.072
	More than ones per year	2(5.7)	2(5.7)	
	Never	28(82.8))	15(42.9)	
Frequency of use of dental floss/month	Ones	0(0)	2(5.7)	**0.041**
	Twice	0(0)	4(11.4)	
	Never	35(100)	29(82.9)	

Factors Associated with Gingival Enlargement

- **Oral Indices**

The relationship between periodontal parameters and gingival enlargement is presented in Table 4. Plaque index, calculus index, and gingival bleeding index were significantly associated with gingival enlargement (all p<0.001 for primary comparisons). Adjusted odds ratios indicated increased likelihood of gingival enlargement among participants with poorer periodontal status.

Table 4: Relationship between oral indices and gingival enlargement

Oral Indices	Gingival enlargement index					
	Score 0	Score 1	Score 2	P value	OR (CI 95%)	AOR (CI 95%)
Plaque Index						
Score 1	28(44.4)	0(0)	0(0)	<0.001	164.3 (18.68-1445.39)	3.64 (1.45-5.64)
Score 2	16(25.4)	0(0)	0(0)	<0.001	28.6 (3.5- 233.08)	1.34 (0.84-2.52)
Score 3	19(30.2)	7(100)	0(0)	<0.001	4.7 (1.64-13.74)	0.67 (0.02-1.23)
Calculus Index						
Score 1	31(49.2)	0(0)	0(0)	<0.001	263(27.9- 2486.93)	18.45 (4.67-26.65)
Score 2	19(30.2)	4(57.1)	0(0)	<0.001	9.21 (2.68- 31.66)	1.23 (1.11-2.56)
Score 3	13(20.6)	3(42.9)	0(0)	0.008	6.30 (1.60-24.74)	1.03 (0.83-1.45)
Gingival Bleeding Index						
Score 0	42(66.7)	0(0)	0(0)	<0.001	476.01 (47.34-4785.55)	4.98 (3.93- 6.76)
Score 1	19(30.2)	1(14.3)	0(0)	<0.001	40.37 (4.95-328.67)	2.78 (1.19- 3.45)
Score 2	2(3.2)	4(57.1)	0(0)	0.401	0.47 (0.08-2.74)	
Score 3	0(0)	2(28.6)	0(0)	0.563	0.49 (0.04- 5.61)	

- **Anti-Seizure Medication Regimen**

Among persons living with epilepsy, 22 participants were receiving monotherapy, 8 biotherapy, and 5 tritherapy. Gingival enlargement was observed exclusively among participants receiving carbamazepine-containing regimens; however, no statistically significant association was found between treatment regimen and gingival enlargement (p=0.375).

Table 5: Relationship between ASM and gingival enlargement

	Gingival enlargement index			
Drug combination	**Score 0**	**Score 1**	**Score 2**	**P value**
Carbamazepine + sodium valproate	1(3.4)	1(16.7)	0(0)	
Carbamazepine	8(27.6)	2(33.3)	0(0)	
Lamotrigine	2(6.9)	0(0)	0(0)	
Sodium valproate	7(24.1)	0(0)	0(0)	0.375
Phenobarbital	3(10.3)	0(0)	0(0)	
Carbamazepine + phenobarbital	2(6.9)	2(33.3)	0(0)	
Carbamazepine + sodium valproate + phenobarbital	4(13.8)	1(16.7)	0(0)	
Phenobarbital + sodium valproate	2(6.9)	0(0)	0(0)	

- **Anti-Seizure Medication Dose**

No statistically significant association was observed between daily dosage of carbamazepine (p=0.081), sodium valproate (p=0.540), or phenobarbital (p=0.895) and gingival enlargement.

Table 6: Relationship between ASM daily dose and gingival enlargement

	Gingival enlargement index			
Drug dose	**Score 0**	**Score 1**	**Score 2**	**P value**
Carbamazepine	373.33 ± 70.37	300 ± 109.54	0(0)	0.081
Sodium valproate	500 ± 0.0	500 ± 0.0	0(0)	0.540
Phenobarbital	100 ± 0.0	100 ±0.0	0(0)	0.895

- **Duration of Anti-Seizure Medication Therapy**

Duration of anti-seizure medication therapy was not significantly associated with gingival enlargement for carbamazepine (p=0.130), sodium valproate (p=0.519), phenobarbital (p=0.688), or lamotrigine (p=0.780). Gingival enlargement occurred across different treatment duration categories without a clear temporal pattern.

Table 7: Association between duration of ASM and gingival enlargement according to drug type

Drug	**Duration**	**Score 0 n (%)**	**Score 1 n (%)**	**Score 2 n (%)**	**P value**
Carbamazepine	<6 months	3 (20.0)	0 (0)	0 (0)	0.130
	6 months–<1 year	2 (13.3)	1 (16.7)	0 (0)	
	1–5 years	3 (20.0)	3 (50.0)	0 (0)	
	5–10 years	6 (40.0)	0 (0)	0 (0)	
	>10 years	1 (6.7)	2 (33.3)	0 (0)	
Sodium valproate	<6 months	4 (28.6)	1 (33.3)	0 (0)	0.519
	6 months–<1 year	1 (7.1)	0 (0)	0 (0)	
	1–5 years	3 (21.4)	2 (66.7)	0 (0)	
	5–10 years	3 (21.4)	0 (0)	0 (0)	
	>10 years	3 (21.4)	0 (0)	0 (0)	
Phenobarbital	<6 months	1 (11.1)	0 (0)	0 (0)	0.688
	1–5 years	3 (33.3)	4 (36.4)	0 (0)	
	5–10 years	3 (33.3)	3 (27.3)	0 (0)	
	>10 years	2 (22.2)	3 (27.3)	0 (0)	
Lamotrigine	<6 months	1 (50)	0 (0)	0 (0)	0.789
	1–5 years	1 (50)	0 (0)	0 (0)	
	5–10 years	0 (0)	0 (0)	0 (0)	
	>10 years	0 (0)	0 (0)	0 (0)	

DISCUSSION

The present study demonstrated that gingival enlargement was more frequent among persons living with epilepsy compared with matched healthy controls, although all observed cases were limited to mild (grade 1) enlargement. Participants with epilepsy also exhibited

poorer periodontal health indices, including higher plaque accumulation, calculus deposition, and gingival bleeding scores, together with reduced utilization of preventive dental care services. Gingival enlargement occurred only among participants receiving carbamazepine-containing regimens; however, treatment regimen, daily dose, and duration of therapy were not statistically associated with gingival enlargement.

Gingival Enlargement Prevalence and Severity

Drug-induced gingival enlargement is a well-recognized adverse effect associated with several classes of medications, including anticonvulsants [9]. Previous investigations have reported variability in the prevalence and severity of gingival enlargement depending on the specific anticonvulsant agent and patient-related factors such as oral hygiene and inflammatory status [65]. The exclusive presence of mild (grade 1) enlargement in our cohort suggests early or limited gingival tissue involvement rather than advanced fibrotic overgrowth. This observation may be related to the absence of phenytoin use among study participants, as phenytoin has historically been associated with more pronounced gingival enlargement [9-65].

Oral Hygiene Status and Behavioral Factors

Persons living with epilepsy in this study demonstrated poorer periodontal health compared with controls, characterized by higher plaque index, calculus index, and gingival bleeding scores. These findings are consistent with previous epidemiological studies reporting poorer oral health status among patients with epilepsy compared with the general population [41-68]. Reduced dental attendance and absence of floss use among persons living with epilepsy further suggest potential barriers to preventive oral care in this population. Prior studies have highlighted challenges such as reduced prioritization of oral health, psychosocial factors, or limited access to dental services as contributing factors to oral health disparities in epilepsy [41].

Relationship between Periodontal Indices and Gingival Enlargement

Gingival enlargement occurred exclusively among participants presenting with the highest plaque index score, supporting the potential contribution of local inflammatory burden to gingival tissue changes. Previous research has emphasized the role of periodontal inflammation as an important cofactor in the development of drug-induced gingival overgrowth [9-70]. Gingival bleeding index showed the strongest statistical association among periodontal parameters in the present study, further supporting the hypothesis that inflammatory processes may interact with drug-related effects in the pathogenesis of gingival enlargement. However, given the small number of gingival enlargement cases and wide confidence intervals, these findings should be interpreted cautiously and cannot establish causal relationships.

The observed association between gingival enlargement and elevated periodontal indices supports a multifactorial model involving both local inflammatory processes and drug-related tissue responses. Drug-induced gingival enlargement is thought to result from altered fibroblast activity, extracellular matrix accumulation, and reduced collagen degradation, mechanisms that may be modulated by anticonvulsant therapy [9]. However, the expression of gingival overgrowth is widely recognized to depend on the presence of local inflammatory stimuli, particularly dental plaque accumulation and gingival inflammation. Increased plaque burden promotes cytokine-mediated inflammatory pathways that may enhance fibroblast proliferation and extracellular matrix deposition, thereby facilitating gingival enlargement in susceptible individuals [69, 70]. In this context, the exclusive occurrence of gingival enlargement among participants with the highest plaque index scores in the present study suggests that inflammation may act as a prerequisite or cofactor rather than a standalone cause. This interaction between medication exposure and local periodontal environment may explain why gingival enlargement develops only in a subset of treated patients despite widespread use of anti-seizure medications.

Anti-Seizure Medications and Gingival Enlargement

Although gingival enlargement occurred only among participants receiving carbamazepine-containing regimens, no statistically significant association was identified between drug regimen, daily dose, or duration of treatment and gingival enlargement. Previous studies have reported heterogeneous findings regarding the relationship between anticonvulsant therapy characteristics and gingival overgrowth. Some investigations have identified associations between specific medications or treatment parameters, while others have reported no clear relationship [11-75]. The clustering of cases among carbamazepine users in this study should therefore be considered hypothesis-generating rather than evidence of a causal relationship.

Pharmacovigilance data have identified anticonvulsants among drug classes implicated in drug-induced gingival overgrowth, although such databases do not provide prevalence estimates among treated populations [67].

Strengths and Limitations

This study benefits from the inclusion of age- and sex-matched controls and the use of standardized periodontal indices, providing a structured comparison between persons living with epilepsy and healthy individuals. Furthermore, the study contributes locally relevant data in a setting where oral health outcomes among patients with epilepsy remain insufficiently documented. However, several limitations must be acknowledged. The relatively small sample size and limited number of gingival enlargement cases reduce statistical power and may explain the wide confidence

intervals observed in regression analyses. Additionally, recruitment from hospital-based settings may limit generalizability to the broader community.

CONCLUSION

Gingival enlargement in persons living with epilepsy appears to result from a complex interaction between periodontal inflammation and exposure to anti-seizure medications rather than pharmacological factors alone. The absence of association with drug dose or treatment duration suggests that local inflammatory burden may be a key determinant of susceptibility to gingival tissue changes. Patients with poorer periodontal indices may therefore represent a higher-risk subgroup requiring closer monitoring. These findings support the integration of oral health evaluation into routine neurological care, emphasizing early identification of gingival inflammation and reinforcement of preventive oral hygiene practices. Targeted oral health monitoring may help mitigate complications without modification of effective anti-seizure therapy. Multidisciplinary collaboration between neurologists and dental professionals may further improve comprehensive management, particularly in settings where preventive dental services remain underutilized.

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