

## GEOGRAPHIC TONGUE: PATTERN OF PRESENTATION IN A SOUTH WESTERN NIGERIAN TEACHING HOSPITAL

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### ABSTRACT

**Background:** Geographic tongue (GT) is one of the commonly seen lesions in Oral Medicine Clinic. It tends to show varying pattern of presentation. Excessive immune response and immune modulation has been implicated in the pathogenesis and this justified the use of steroid in the management.

**Objective:** This study describes the epidemiology, clinical presentations and treatment outcomes of the 21 cases of GT seen at the Oral Medicine Clinic of Obafemi Awolowo University Teaching Hospitals' Complex, Ile Ife (OAUTHC) over a period of 10 years and compared the findings with the results from other parts of the world.

**Methods:** This was a retrospective cohort review of cases of geographic tongue seen in the Oral Medicine of OAUTHC over the period of 10 years of Oral Medicine practice in the center from May 2007 to May 2017. The diagnosis of GT was made based on its typical clinical presentation. Information retrieved from the case notes included age, sex, presenting complaints, clinical findings, treatment and treatment outcomes.

**Results:** Only 21 cases of GT were diagnosed during the study period, giving a prevalence of 2.1% consisting of 11males and 10 females with mean age of 29.5 ±13.9 years. About half (10 cases) were diagnosed following routine oral examinations while burning tongue sensation, itchy sensation and taste impairment accounted for the presenting complaints among the symptomatic cases. Lesions were mostly seen in the anterior two-third of the tongue (9 cases). All patients responded well to topical steroids.

**Conclusion:** This study had shown that GT was more prevalent in younger age group with slight male predilection. More than half of patients presented with symptoms. Successes were recorded with topical steroids.

### INTRODUCTION

Geographic tongue (GT) also known as benign migratory glossitis, erythema migrans and annulus migrans is a benign disorder of the tongue characterized with multiple, well-demarcated, erythematous, depapillated patches surrounded by a slightly elevated whitish border, and usually restricted to the dorsum of the tongue.<sup>1,2</sup> Geographic tongue was first described by Rayer in 1831 as wandering rash of the tongue.<sup>3</sup> These lesions may change in location, pattern and size, hence the name 'migratory'.<sup>4</sup> Lesion can occur in other sites apart from the tongue, then the term ectopic geographic tongue or erythema circinata migrans is employed as first coined by Crooke in 1955.<sup>3,5</sup>

It is usually a transient and recurrent lesion of the tongue and may heal without treatment.<sup>3</sup> GT is found in 1-2.5% of the population, and it appears to be commoner among females in middle age group.<sup>3</sup> The suggested etiology include emotional stress, Immunological factors, genetic factors, atopic or

allergic tendency, emotional stress, tobacco consumption, hormonal disturbances, zinc deficiency, fissured tongue, psoriasis and diabetes mellitus.<sup>1,6,7</sup>

The common symptoms associated with symptomatic GT are burning sensation, taste impairment, tongue pain, cancer phobia or aesthetic concerns.<sup>2</sup> In many cases, geographic tongue is asymptomatic. Treatment is usually required only in the symptomatic cases. There is no definitive treatment protocol or cure for this lesion but topical steroids (such as triamcinolone acetomide), retinoic acid, cyclosporine, antihistamine, tacrolimus and immune system regulators have been used in proposed treatment plans.<sup>2,6,8</sup> Treatment is, however, not curative but modulate inflammatory and immunological responses, which is their chief mechanism of action.<sup>5</sup>

Although usually asymptomatic, the symptomatic cases could be quite disturbing and has been found to be associated with mental illness, stress and

reduction in the quality of life of the affected patients.<sup>4,9</sup> The pattern of presentation of GT, like any other lesion, shows variations especially as it relates to causative factors which will ultimately determine the specific management approach in each environment. Allergy has been implicated in the etiology, the allergens differ depending on the environment.<sup>6</sup> Very few studies have documented associated clinical features and pattern of presentation of GT in the African population. The purpose of this study is to add to the body of knowledge of the research subject in the Nigerian population.

## METHODOLOGY

### Study Design

This was a retrospective cohort review of all the cases of geographic tongue seen in the Oral Medicine of OAUTHC over the period of 10 years of Oral Medicine practice in the center from May 2007 to May 2017.

### Study Setting

The Obafemi Awolowo University Teaching Hospital sees on the average 72,415 new patients per annum. The Dental Hospital Unit from which this study was conducted also sees an average of 3000 patients per annum. All patients recruited for this study were diagnosed and managed by residents and trained specialists in Oral Medicine.

### Study Protocol

Clinical records (case notes) of all patients diagnosed with geographic tongue within the study period were retrieved and reviewed. The clinical diagnosis of geographic tongue was made based on clinical appearances of multiple, well-demarcated, erythematous, depapillated patches surrounded by a slightly elevated whitish border on the dorsum of the tongue as reported by Kramer *et al*, 1980.<sup>10</sup> The above mentioned protocol describes our routine method of clinical diagnosis of GT in our clinic. Other information retrieved from the case notes included age, sex, presenting complaints, clinical findings, results of laboratory investigations, treatment and treatment outcomes.

### Data Analysis

Data analysis was done using STATA 12 statistical software (Statacorp, College Station, Texas, USA). Descriptive statistics was used to characterize socio-demographic variables such as age, sex, marital status and occupation. For descriptive continuous variable such as age, the mean, median, minimum value, maximum value and appropriate measures of variability were determined. For descriptive variables that are categorical such as sex and the clinical

presentation of geographic tongue, simple frequency and percentages were determined. Bivariate analysis such as *t*-test, Fisher's exact and chi-square statistics or their non-parametric equivalents were used as appropriate to compare between two variables as may require. Statistical significance was inferred at  $p < 0.05$  and confidence interval was set at 95% for all the analysis.

## RESULTS

### Sociodemographic of the Patients

A total of 21 cases were seen and reviewed, 11 (52%) were males and 10(48%) females. Their mean age was  $29.7 \pm 13.5$  years. (Table 1)

**Table 1:** Socio-demographics of the Patients with Geographic Tongue

Variable	Frequency(%)
<b>Age Category</b>	
<20	5 (23.8)
21-30	8 (38.1)
31-40	3 (14.3)
41-50	3 (14.3)
51-60	2 (9.5)
<b>Sex</b>	
Male	11 (52.4)
Female	10 (47.6)
<b>Occupation</b>	
Schooling	15 (71.4)
Trading	6 (28.5)

### Age, Sex, Etiology, Presenting Complaints and Relevant History

Twelve patients presented on account of symptoms ranging from itchy sensation on the tongue to the presence of white patch on the tongue while seven patients were asymptomatic as the oral lesions were noticed during routine clinical examination.

None of the patients volunteered positive history of smoking; only one patient takes alcohol. Many of the patients presented before two weeks of having the lesion. Physical stress and recent episode of malaria were some of the common clinically identified predisposing factors/etiologies. (Table 2)

### Presentation of the Lesion

Lesions generally appear as de-papillated/erythematous area surrounded by raised white lesion on various locations on the tongue (Fig. 1 and 2)

### Clinical Findings, Investigations, Treatment and Treatment Outcomes

Anterior two third of the tongue was the most affected part of the tongue, seen in 10 patients. Skin involvement (Psoriasis) was only present in one patient who was actually referred from Dermatology Unit of the same hospital. Results of hematological

**Table 2:** Clinical features of subjects

Variables	Frequency (%)
Presenting Complaints	
Itchy tongue	5 (23.8)
Painful and burning tongue	6 (28.5)
White patch on the tongue	2 (9.5)
Incidental findings	7 (33.3)
Referred from Dermatology Clinic	1 (4.8)
Duration before Presentation	
1-2 Week	7 (33.3)
>2 week	14 (66.7)
Alcohol	
Present	1 (4.8)
Absent	20 (95.2)
Smoking	
Present	0 (0)
Absent	20 (100)
Suspected etiology/ predisposing factors	
Malaria	7 (33.3)
Emotional stress	1 (4.8)
Nutritional deficiency	2 (9.5)
Physical stress	4 (19.0)
Allergy	2 (9.5)
Not specific	5 (23.8)

**Table 3:** Tongue findings, investigation results, treatment and treatment outcomes

Variable	Frequency (%)
Location of lesion on the Tongue	
Anterior two-third	10 (47.6)
Anterior one-third	2 (9.5)
Middle one third	1 (4.8)
Dorsum and lateral surface	8 (38.1)
Skin Involvement	
Present	1 (4.8)
Absent	20 (95.2)
Fissured tongue	
Present	5 (23.8)
Absent	16 (76.2)
Full blood count	
Within normal range	20 (95.2)
Increased	0 (0)
Reduced	1 (4.8)
Treatment given	
Regimen A	7 (33.3)
Regimen B	14 (66.7)
Treatment outcome	
Satisfactory	21 (100)
Not satisfactory	0 (0)

*Regimen A: Kenalog in oral base to be applied 8 hourly for 2 weeks*

*Tabs Vit Bco 1 tab 8 hourly for 2 weeks*

*Tabs Folic acid 1 tab daily*

*Regimen B: Topical lignocaine gel when necessary*

*10% dexamethasone mouth rinse 12 hourly for one week*

*Tabs Vit Bco 1 tab tds for 2 weeks*

*Tabs Folic acid 1 tab daily*



**Fig 1:** Clinical Pictures of GT on the dorsum of the tongue

*Note the multifocal, circinate, irregular erythematous patches bounded by a slightly elevated keratotic band or line on the anterolateral dorsum of the tongue*



**Fig 2:** Clinical picture of GT tongue (Ventral)

*Note the multifocal, circinate, irregular erythematous patches bounded by a slightly elevated keratotic band or line on the ventral surface of the tongue*

investigations were normal for most patients except one patient who had reduced white blood cell count of 2000cell/ml. All the patients responded satisfactorily to topical local anesthetic agent (for symptomatic cases) steroid and multivitamins. (Table 3)

## DISCUSSION

The prevalence of GT in this study was 2.1%, which is within the global normal range of 0.6 – 4.8% as reported by Picciani *et al.*<sup>11</sup> Though a higher prevalence of GT up to 10% has been documented among psoriasis patients.<sup>11,12</sup> Only one case of GT associated with Psoriasis was seen in this study.

The present study showed a wide age range from 7 to 60 years with more of the subjects seen at younger age group below 30 years. In fact, majority of the

subjects were seen in 21-30 years age group. This is in agreement with Jainkittivong *et al*<sup>13</sup> that reported a wide age range from 9 to 79 years. According to Jainkittivong *et al*<sup>13</sup> the highest incidence of GT is in the 20-19 age group, a gradual reduction prevalence as the age increases was also reported by them, this was consistent with the results of this study, probably because exposure to the commonly implicated predisposing factors are more frequent at this age group.<sup>11</sup> Like other reports in the literature,<sup>11,13</sup> slight female predilection was also observed in this study with female to male ration of 1.1:1. Sex hormonal changes have been reported to be an etiologic factor in females and hence may be responsible for the slight female predilection.<sup>14</sup>

Many studies had earlier reported that most cases of GT are asymptomatic<sup>6,11,13</sup> this study, however, showed that more than half of the subjects (12) presented with complaints ranging from burning sensation, pain and itchy sensation on their tongue. This is not unexpected since most people who come to the clinic come on account of pain or other complaints, this study was a clinic based study and that will most likely be responsible for the higher prevalence of symptoms among GT patients in this study. As shown in this study, anterior two third of the tongue is the most affected part of the tongue, seen in 10 patients, followed by the lateral surface of the tongue. These findings are consistent with the reports of Ghalayani *et al*<sup>14</sup>, Jainkittivong *et al*<sup>13</sup> and Najafi *et al.*<sup>6</sup> Jainkittivong *et al*, after examining 188 cases of GT in Thailand, however, reported lateral margin of the tongue as well as the tip of the tongue as the commonest tongue sites. In addition Jainkittivong *et al* reported that 62.8% of their patients had GT in multiple tongue sites unlike this study where multiple tongue site involvement was observed in less than half<sup>8</sup> of the cases. The present study was a retrospective study which only assessed the stored data unlike the Jainkittivong's study which was a prospective study. Also, their sample size (188 GT patients) was larger than ours. Moreso, the role of genetic influences on clinical presentation of GT in each environment may play some roles. Fissured tongue was not frequently associated with GT in this study. It was only recorded in 5 (23.8%) cases. Jainkittivong *et al*<sup>13</sup>, Zarqari *et al*<sup>12</sup> and Picciani *et al*<sup>11</sup> had earlier reported close association between GT and fissure tongue as high as 8%. Fenerli *et al* reported the roles of genetics in establishing an association between GT and fissured tongue. In their study, they postulated a polygenic mode of inheritance for GT and fissured tongue.<sup>15</sup> Certain human leukocyte antigens such as (HLA)-DR5, HLA-DRW6, and HLA-Cw6 have been associated with GT.<sup>15</sup> Also the fissure may provide a stagnation where the glossitis may begin.<sup>3</sup> GT has been associated with

many predisposing factors such as psychological stress, allergy and genetic influences.<sup>5</sup> In this study malaria and stress were the major predisposing factors identified. The study was conducted in the tropics where malaria is a major public health problem. The treatment of GT has been challenging as the disease has no definitive cure.<sup>5</sup> Understanding the inflammatory nature with genetic and immunological influence on the pathogenesis has been the basis for the use of steroid as first line treatment with considerable relief of symptoms. Some researchers had tried the combination of triamcinolone and retinoic acid as well as tacrolimus with some considerable improvement.<sup>6,8</sup> In this study, our patients were treated with topical steroid in form of 10% dexamethazone mouth rinse and haematinics. For symptomatic cases we introduced topical anaesthetic agents (lignocaine gel) to provide immediate relief of symptoms. All our patients responded satisfactorily to this regimen with no symptoms after 3 weeks of treatment. Najaf *et al*<sup>6</sup> introduced a combination of 0.1% triamcinolone with 0.05% retinoic acid in oral base which gives similar results as using topical steroid alone. The retinoic acid was expected to boost the immunity. In this clinic haematinics is routinely prescribed, which we believe it is to perform the function of boosting the patient's immunity and hence, this might explain the similar satisfactory results obtained.

## CONCLUSION

The prevalence of GT found in this study (2.1%) is within the normal range of GT prevalence reported worldwide. The condition affects a wide age range (but was most commonly seen in the third decade of life), with a slight male preponderance. Commonly associated symptoms were pain, burning sensation and itching sensation on the tongue. Five patients with GT in this study had fissured tongue. Subjects responded well to topical steroid and haematinics. Topical lignocaine helped in the local control of pain for those that were symptomatic.

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