

## Benign Migratory Glossitis Prevalence and Its Association with Other Tongue Lesions and Systemic Conditions: A Cross-Sectional Study in a Population of Tripoli, Libya

Abeer Hussein Elsagali<sup>1</sup>, Abdurahman Musbah Elmezwghi<sup>2\*</sup>, Naima M El-kakalli<sup>3</sup>, Ahmed Mustafa Keshlaf<sup>4</sup>

<sup>1</sup>Associated Professor, Oral and Maxillofacial Surgery Department, Faculty Dentistry, University of Tripoli, Tripoli-Libya

<sup>2</sup>Assistant Professor, Oral Pathology Department, Faculty of Dentistry, University of Tripoli, Tripoli, Libya

<sup>3</sup>Lecturer Oral Pathology, Oral Pathology Department, Faculty of Dentistry, University of Tripoli, Tripoli, Libya

<sup>4</sup>Assistant Professor, Oral Medicine, Diagnosis and Radiology Department, Faculty Dentistry, University of Tripoli, Tripoli, Libya

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\*Corresponding author: Abdurahman Musbah Elmezwghi

Associated Professor, Oral and Maxillofacial Surgery Department, Faculty Dentistry, University of Tripoli, Tripoli-Libya

### Abstract

**Background:** Benign migratory glossitis (BMG) is an inflammatory disorder, usually asymptomatic, of unknown aetiology, which regularly happens at the dorsum of the tongue and may sometimes involve its lateral borders. BMG prevalence among adults ranges from 0.28% to 2.4%. It appears to become more females in the middle age group. **Aim:** This study aimed to determine the prevalence of BMG and evaluate the possible correlation between the occurrence of BMG with age, gender, burning symptoms and some systemic conditions. **Materials and Methods:** The present cross-sectional study was conducted at the Dar Alfordous dental facility, Tripoli – Libya. A random sample of 577 patients attended the dental clinics over nine months. The patients were examined for the presence of BMG over one year. **Statistical analysis:** A chi-square test was done to assess the correlation of BMG with age, gender, burning sensation and some systemic conditions. **Result:** The prevalence of BMG among Tripoli city, Libya's population was as high as (10%). Fissured tongue (FT) (35.7%) revealed a high association with BMG followed by the hairy tongue (HT) (3.5%). Prevalence of BMG was found to be significantly higher in the < 20 (3-19) years old (13%) (P = 0.004). **Conclusion:** BMG among this study sample of the population showed a higher prevalence rate. BMG was more frequently observed in children and young adults and most prevalent in females. Based on our results, there was a significant association between BMG and FT.

**Keywords:** Benign migratory glossitis, prevalence, Tripoli population, associated other tongue lesions, associated systemic conditions.

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### INTRODUCTION

Diagnosis of various developmental disorders of the tongue is an important part of daily dental practice [1]. Geographic tongue is one of the most commonly reported tongue disorders in most studies worldwide [2]. BMG is an inflammatory condition usually asymptomatic, of unknown etiology, frequently occurring on the dorsum of the tongue and sometimes involving its lateral border [3]. BMG was first identified in 1831 by French physician Dr Rayer as an intermittent rash on the tongue [4]. BMG is a condition that goes by various names in the literature, such as geographic tongue, erythema migrans, line migration, and rash migration of the tongue [5]. The prevalence of

GMB ranges from 0.28% to 2.4% in adults and from approximately 0.6 to 9% in children [6]. It seems to develop more in middle-aged women [7].

BMG usually manifests itself in infancy between 6 and 12 months, most commonly at 4 years of age [8]. No researches have so far been able to pinpoint the precise cause of BMG. Nonetheless, a number of factors have been identified as contributors, including emotional stress, nutritional deficiencies, allergies, heredity and genetics, and immunosuppression [9]. BMG is usually an isolated disease, but has been associated with psoriasis, atopic diathesis, diabetes, reactive bronchitis, anemia, stress, hormonal imbalance,

Reiter's and Down's syndromes, and lithium treatment [10]. BMG is often associated with fissured tongue (FT) [11]. Clinically, BMG is characterized by erythematous areas of atrophic filiform papillae on the tongue that render their surface texture uneven and illdefined, sometimes causing irritation and burning [12]. This developmental anomaly is characterized by periods of exacerbations and remissions, with the severity of symptoms depending on disease activity [13]. BMG was diagnosed based on history and clinical presentation [14]. The central area of erythema and the peripheral whitish band were consistent with histology, showing focal atrophy of filiform papillae and squamous epithelium with infiltration of neutrophils and subepithelial lymphoplasmacytic cells [15]. However, histopathological confirmation is rarely required [16]. If necessary, histo-pathological examination can help confirm the final diagnosis [17].

In atypical lesions, the differential diagnosis of BMG includes atrophic candidiasis, neutropenia, psoriasis, Reiter's syndrome, leukoplakia, lichen planus, systemic lupus erythematosus, herpes simplex, and drug reactions [18].

Patients with BMG typically don't need therapy because the condition is benign and has an essentially asymptomatic course. If symptoms such as pain and/or burning sensation are present, mouth washes containing local anesthetics or topical corticosteroids are prescribed [19].

## MATERIALS AND METHODS

The present cross-sectional study was conducted at Tripoli Dar Alfarouds dental facility, Tripoli – Libya. A random sample of 577 patients attended the dental clinics over nine months from March 2022 to December 2022. Permission from the ethics committee and written typed consent were obtained before the study. Personal history: age, gender and detailed dental, as well as medical history, were registered. Examination of the oral cavity particularly the presence of BMG and associated other tongue lesions according to world health organization guidelines was done by the co-authors who were specialists in oral pathology, oral medicine and oral and maxillofacial surgery. The collected data was then tabulated and sent for statistical analysis using Microsoft Excel (Microsoft Office 2013) and SPSS® 21 (IBM, USA) to describe the quantitative data, mean and standard deviation were used. The cross-tabulation

tables, bar and pie charts were used to describe the qualitative data. A chi-square test was done to assess the correlation of BMG with age, gender, burning symptoms and some systemic conditions. A *P* value < 0.05 was considered to be statistically significant.

## RESULTS

Among the randomly collected study sample of 577 patients, 56 cases of the patients showed to have BMG lesions, most commonly observed on the anterior two-thirds of the dorsum of the tongue. The prevalent rate of BMG was (10%) (Fig 1) and (Fig 2).

The age range of patients was (3 to 102 years) with an average age of about 36.5 years and a standard deviation of  $\pm 16.6$ . The ages of the patients were categorized into four groups (< 20, 20- 39, 40-59, and  $\geq 60$ ) Overall, the prevalence of BMG was found significantly higher in the < 20 (3-19) years old (13%) (*P* = 0.004). On the other hand, BMG was found to be the least in the  $\geq 60$  years (4.9%) (Fig 3).

Out of 577 patients considered for this study showed 43 cases (7.4%) were females and 13 cases (2.2%) were males and was thus considerably higher in females. The difference was found to be statistically significant (*P* < 0.05) (Table 1). Overall male to female ratio was approximately (1:3.3).

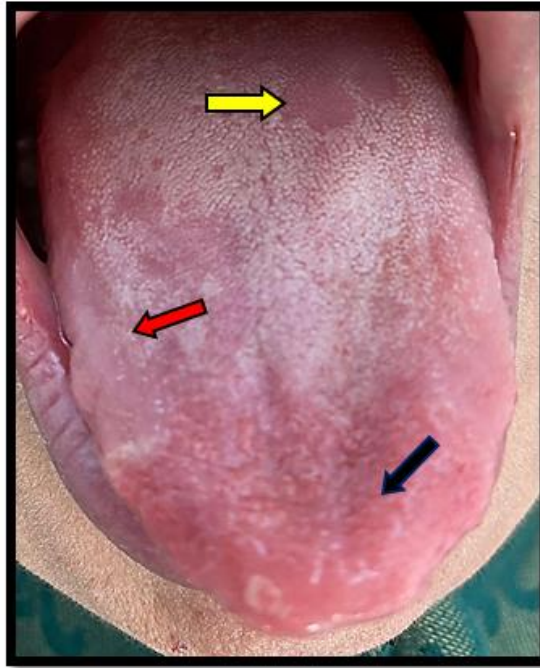
Among 65 patients with BMG 54 were asymptomatic (96.4%) and only 2 cases were symptomatic (3.5%), therefore the majority of subjects with BMG had no burning sensation symptom. This made the burning sensation not significantly associated with BMG (Fig 4).

The most frequent other tongue lesions detected in the studied sample were (FT) 20 cases (35.7%) followed by median rhomboid glossitis (MRG) 2 cases (3.5%), hairy tongue (HT) only 1 case (1.7%) and also lichen planus (LP) 1 case (1.7%) (Fig 5).

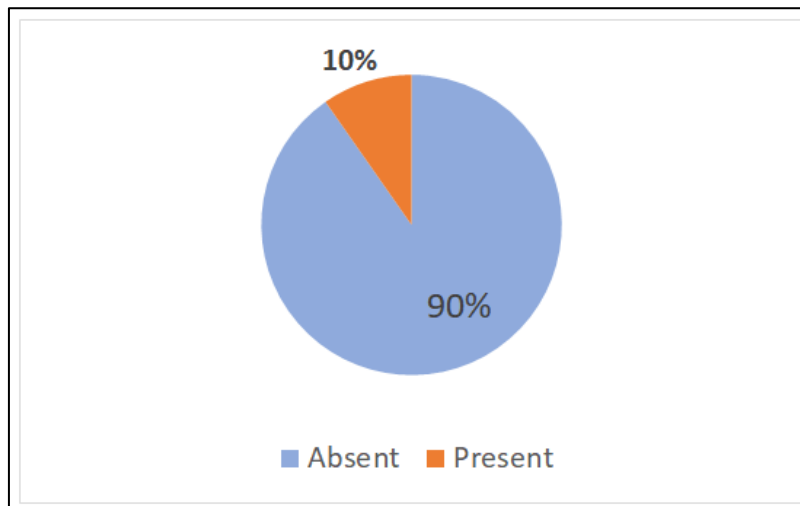
All of these cases had BMG which revealed a high association with FT. The majority of patients with BMG did not have systemic conditions 52 (92.8%). DM 2 cases (3.5%) was the most frequent systemic condition in subjects with BMG, followed by hypertension 1 case (1.7%), and also asthma 1 case (1.7%) (Table 2).

**Table 1: Distribution and frequency of BMG according to the gender**

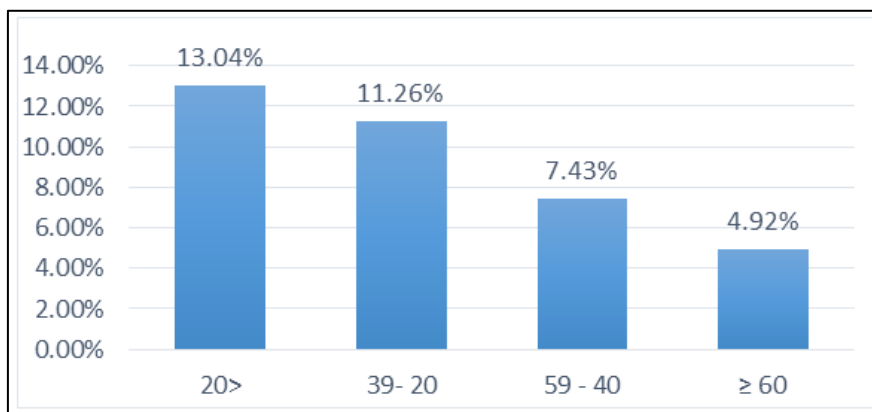
Gender	Absent		Present		Total %	Total no.
	%	no.	%	no.		
Female	62.91%	363	7.45%	43	70%	406
Male	27.38%	158	2.25%	13	30%	171
Grand Total	90.29%	521	9.71%	56	100%	577



**Fig 1:** Intra- oral Photograph showing benign migratory glossitis affecting anterior two third (black arrow) and posterior one third of the tongue (yellow arrow) as well as the right lateral border of the tongue (red arrow)



**Fig 2:** Pie chart representing the prevalence of BMG in the entire study sample



**Fig 3:** Bar graph demonstrating the percentage distribution of BMG present in different age groups

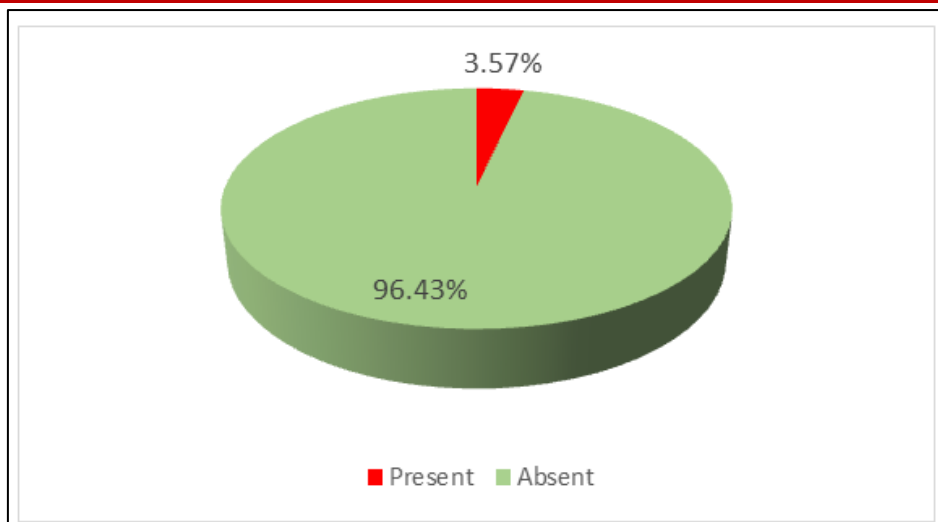


Fig 4: Pie chart showing the frequency of burning sensation among BMG subjects

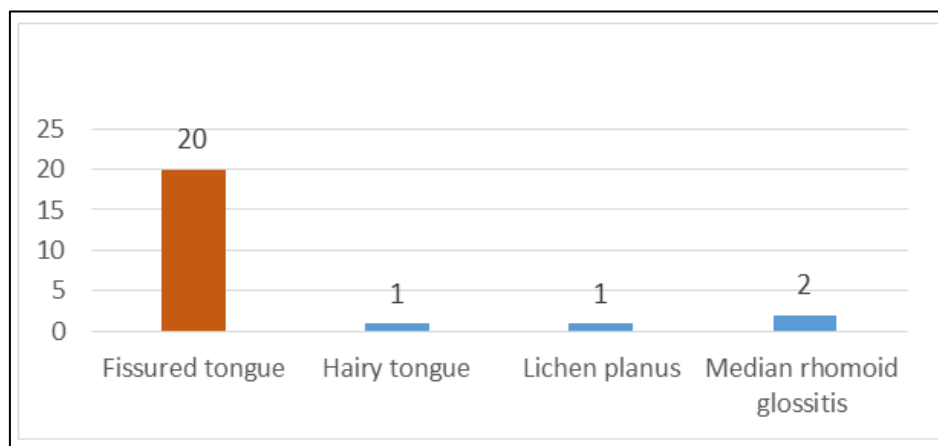


Fig 5: Bar graph demonstrating the most frequent systemic conditions associated with BMG subjects

Table 2: Association of systemic conditions with presence or absence of BMG

Systemic conditions	With systemic conditions		Without systemic condition	
	no	%	no	%
Diabetes Mellitus	2	3.5	52	92.8
Hypertension	1	1.7		
Asthma	1	1.7		
Total	4	6.9		

## DISCUSSION

This study aimed to determine the prevalence of BMG and also to evaluate the possible correlation between the occurrence of BMG with age, gender, burning symptoms and some systemic conditions.

The worldwide prevalence of BMG is between 1.0% and 2.5% [1]. Additional investigations found prevalence rates of 12.8%, 12.4%, 1.5%, and 1.8%, respectively. The discrepancy in these results could be attributed to variations in sample sizes and studied populations [13]. The prevalence rate of BMG in our study was (10%). This finding was within the range reported in other studies. However, the results of the present study was lower than (17.2%) previously reported in the Libyan population [2]. Such disparity in

reporting rates may appear due to contrast in study sample sizes and clinical standards.

BMG affecting people of all ages, it is most frequently diagnosed in the first and second decades of life [7]. The age of patients in our study showed that the prevalence of BMG was found significantly higher in the < 20 (3-19) age groups (13%) with a mean age of 36.5 years. This finding was in agreement with Oyetola (2018) [7] who reported that BMG was more common in younger subjects under 30 and also agreed with Ilankizha (2021) [1] who reported that the average age of the affected population was 36.5 years old, but disagreed with Lesan (2021) [20] Who found a higher incidence of BMG in the age group 20-29, the average age of patients was 44 years.

According to our study, as subjects get older, the prevalence of the BMG condition gradually declines.

BMG usually affect 1.5 times as many women as men [19]. In the present study, females (7.4%) were observed to have higher BMG than males (2.2%), with a male to female ratio of 1:3.3. Our results are supported by many previous studies, but disagree with Zargari (2006) (10), who conducted a study of 306 patients and found a higher incidence of MRG in men, and are also disagree with Khayamzadeh (2019) [9] who reported that MRG is equally prevalent among men and women.

BMG is usually asymptomatic but is sometimes accompanied by a burning sensation and sensitivity to spicy foods [8]. In this study, only two BMG patients had a burning sensation on the tongue, a finding consistent with Ilankizhai (2021) [1], who observed that even these lesions were accompanied by a burning sensation in rare cases. The finding of a burning sensation in our study is inconsistent with Oyetola (2018) [7] who found tongue burning in more than half of the subjects in a study of 21 cases.

BMG is frequently associated with FT [11]. In this study, the other tongue lesions most associated with BMG were FT (35.7%), followed by median rhomboid glossitis (MRG) (3.5%), hairy tongue (HT) (1.7%) and lichen planus (LP) (1.7%). Our results are consistent with Zargari (2006) [10], who found a close relationship between BMG and FT, but disagree with the study by Oyetola (2018) [7], who reported that FT and the MRG were rare. However, the association between FT and BMG indicates that these developmental anomalies have a genetic basis. It is thought that tongue lesions may reveal the existence of systemic diseases including diabetes and blood disorders [12]. DM (3.5%) was the most prevalent systemic condition in our study, followed by hypertension (1.7%) and asthma (1.7%). There was 92.8% of the patients with BMG in our study did not have any systemic diseases. Therefore, our data revealed no association between BMG and any other systemic conditions.

## CONCLUSION

This is the first study to be conducted in the western region, specifically in the city of Tripoli, Libya. BMG is a completely benign congenital condition of unknown etiology. BMG among this study sample in the population of Tripoli, Libya, showed a higher prevalence rate 10%. The BMG condition can afflict people of all ages but is most frequently observed in children and young adults and is most prevalent in women. The majority of subjects with BMG in the entire study sample were asymptomatic, however, there were a few symptomatic cases with burning sensation

of the tongue. Based on our results, there was a significant association between BMG and FT. There was no correlation between BMG and any other systemic diseases.

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