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Prevalence of Tongue Lesions Among Dental outpatients Attended in Dental College and Hospital: An Observational Study

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## Abstract

**Introduction:** The tongue is the most accessible and mobile organ in the oral cavity. Data on the prevalence of tongue lesions are scarce, so with this background the present study was designed to observe the prevalence of tongue lesions.

**Method:** An observational study was conducted in the Department of Oral Medicine and Radiology in dental college and hospital. Clinical examination of the oral cavity and tongue was performed under artificial illumination on a dental chair using Mouth mirror, following WHO guidelines.

**Results:** The total number of patients enrolled was 1000, out of these patients, 71 patients had a clinical diagnosis of tongue lesions. The prevalence of tongue lesions was

7.1%. The study sample consisted of 19 females and 52 males. Tongue lesions were more common in males than females. Among the 71 patients, the most prevalent lesion was the fissured tongue for 55.3%, followed by geographic tongue.

**Conclusion:** Subject interviews revealed as none of the subjects were aware of their tongue lesions or relatively low awareness of the existence of tongue lesions.

**Keywords:** Fissured tongue, Benign migratory glossitis, Ankyloglossia, Tongue.

### Introduction

The human tongue is a mobile organ and the most accessible part of the oral cavity. The tongue is essentially a muscular organ covered by epithelium that performs functions such as sucking, swallowing,

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articulating and perception of sensations including taste characteristics, thermal changes, pain stimuli, general sensations and aids in the development of the jaw. <sup>[1]</sup>The tongue is a part of the oral tissue with a very dense, complex structure which is anatomically located in the oral cavity. <sup>[2,3]</sup> The occurrence of various tongue lesions has been extensively studied previously where it has been reported that the tongue can be targeted by a wide range of pathology. <sup>[1,4]</sup> The tongue is usually characterized by progressive growths that can be either benign or malignant and can be affected by nonneoplastic and neoplastic lesions. <sup>[5]</sup> The extent of subject experiences and knowledge of these common lesions of the tongue have not been inspected, nor has treatment attempted by the general dentist for the management of these lesions. Worldwide surveys on the prevalence of tongue lesions, reviewing the literature, revealed a lack of studies exploring that affected subjects were not aware about existence of their tongue lesions. The aim of this study was to assess the prevalence of common tongue lesions as well as assess the frequency of tongue lesions in different age groups with symptoms and awareness of tongue lesions in the studied population.

## **Materials and Methods**

An observational study was conducted in the Department of Oral Medicine and Radiology. 1000 patients reporting to the outpatient department were included in the study. Ethical clearance obtained, study is not experimental or harming to patient, only clinical examination was done and also written informed consent was obtained from the patient. A proper questionnaire includes a detailed family, habit history, medical history, age, gender were recorded. Clinical examination of the oral cavity and tongue was performed on the dental chair under artificial light, using a mouth mirror. The tongue was examined for any surface changes, specific lesions, size, movement and tongue abnormalities. After clinical examination, subjects with tongue lesions were asked whether they were aware about the existence of the lesion or experienced any symptoms related to the lesion. Only those patients who were aware about the existence of their lesions were interviewed regarding their knowledge of the cause of their condition. The data obtained was tabulated and statistical tests were applied to obtain meaningful findings.

#### **Statistical Analysis**

Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 20). Chi-square test of association was used to compare proportions. A p-value of  $\leq 0.05$  was considered statistically significant.

#### Result

A total 1000 outpatients examined in the study, out of those 71 patients found with tongue lesions. They were divided into 52 males and 19 females for inclusion in the study. The subject's age ranged from 15 to 80 years. [Graph 1] describes the prevalence of tongue lesions diagnosed in the study subjects and the proportion of those reporting symptoms. Fissured tongue was the most common lesion and was diagnosed in 40 (55.3%) subjects, while black hairy tongue and coated tongue were the least common lesions. In general, the prevalence of tongue lesions was significantly higher in males than in females.

[Graph 2] shows that the prevalence of benign migratory glossitis decreases significantly with age, while the prevalence of fissured tongue increases significantly with age. Also subject interviews revealed low awareness about existence of tongue lesions as well as none of the subjects were aware of their tongue lesions.

### Discussion

The tongue is considered as a good reflection of the general health of the human body. Tongue disorders can

result as a manifestation of systemic disease or local causes. <sup>[6]</sup> Early identification and diagnosis can be done thorough clinical examination, history of lesions, previous symptoms. Most tongue lesions can present a diagnostic tool for dentists. The tongue is a diagnostic indicator of various systemic diseases and reflects the body. Due to its easy accessibility compared to other parts of the oral cavity, patients can easily survey their tongue. Thus, the oral therapist can do a great service to human kind by thoroughly examining the tongue as it provides valuable clues for diagnosis. <sup>[7]</sup>

## **Fissured Tongue (Lingua Plicata):**

Fissured tongue [Figure 1] is a tongue deformity commonly encountered in dental practice, often presenting as an anterio-posteriorly oriented groove and multiple branch fissures extending laterally, which do not require treatment. The depth of cracks ranges from 2mm to 6 mm. [8] The exact etiology is unknown but a polygenic mode of inheritance is believed. A fissured tongue is usually asymptomatic, but may become symptomatic if the fissures contain food debris. Fissured tongue is generally more common in males than females and increases with age in both sexes. <sup>[9,10]</sup> A diagnosis of fissured tongue is made on clinical examination. To expose the fissures, the tongue has to be protruded so that the fissures can be seen properly.<sup>[8]</sup> The present study was conducted to ascertain the most prevalent pattern of fissured tongue and to evaluate the possible association between the occurrence of fissured tongue with age, sex, systemic disease. The Libyan population had higher prevalence of 48.4%, which was same as present study. The Brazilian population also reported the prevalence to be 27.3%, which was less than the results of the present study. <sup>[29]</sup>

# Geographic Tongue (Benign Migratory Glossitis, Glossitis Areata Migrans, Exfoliativa or Erythema Migrans or Wandering Rash):

Geographic tongue [Figure 1] is a benign, usually asymptomatic, inflammatory condition of unknown origin. Geographic tongue is an idiopathic inflammatory disorder resulting in localized loss of filiform papillae, which present as erythematous patches with map-like wavy edges. <sup>[11,12]</sup> Geographic tongue affects the dorsal surface and margins of the tongue. The etiology of geographic tongue is unknown. <sup>[12]</sup> The condition is common in young and middle-aged people. Males are less affected than females. The disorder is usually asymptomatic, but some patients experience a sensitive, burning or painful sensation, especially when exposed to acidic or spicy foods. <sup>[11,12,13]</sup> Geographic tongue is diagnosed on clinical examination. The differential diagnosis of a patient with benign migratory glossitis may be erythematous candidiasis. This condition requires identification of candidal hyphae. <sup>[13]</sup> The present study was conducted for the most comprehensive conclusion of geographic tongue and to evaluate the possible association between the occurrence of geographic tongue with age, gender, systemic disease. The prevalence of geographic tongue in the present study was 23.9%. This was in line with the findings in the Brazilian population and Libyan population which showed a prevalence of 21% and 17.4% respectively.<sup>[29]</sup>

### Median Rhomboid Glossitis:

Median rhomboid glossitis (MRG) [Figure 2] is defined as central papillary atrophy of the tongue. <sup>[14]</sup> It was first described by Brocq in 1914 and occurs in less than 1% of the general population. <sup>[18]</sup> Males are more prevalent than females. Its etiology is unknown, although it has been suggested that it may arise from chronic candidiasis, or may be embryological, inflammatory or

even immunological in origin. The MRG is usually located around the midline of the dorsum of the tongue. as a well-demarcated, symmetrical, It occurs depapillated area arising anterior to the circumflex papillae. The surface of the lesion may be smooth or [15] lobulated. While most cases are usually asymptomatic, some patients may present with persistent pain, inflammation, or itching. <sup>[14,15]</sup> There are some precipitating factors associated with MRG such as smoking, wearing dentures, diabetes mellitus and candidal infections. <sup>[16,17]</sup> The present study was conducted to find out the prevalence and to evaluate the possible association between the incidence of MRG with age, sex, systemic conditions. The prevalence of median rhomboid glossitis in the present study was reported to be 4.2%. A prevalence of 0.6% has been reported in Jordanian and Libyan population.<sup>[29]</sup>

### **Coated Tongue (Tongue Coating):**

Tongue coating (TC), [Figure 2] a gray-white deposit on the tongue. There is unknown etiology of TC formation. TC consists of dead epithelial cells, bacteria, blood metabolites, secretions from the nasal area and mucus. <sup>[19]</sup> Tongue papillae, particularly filiform papillae have specific structures involved in TC formation. <sup>[20]</sup> Between these filiform papillae food particles, mucus and bacteria can trap, resulting in the formation of a dense coating.<sup>[21]</sup> TC is common in healthy people. Normal TC is characterized by a thin, slightly moist, white substance, vary in color, thickness and distribution depending on the patient's health. [22] Diagnosis of tongue coating is made on clinical examination. The present study was undertaken to achieve the most comprehensive level of tongue coating and to assess the possible association between age, sex, systemic conditions and the occurrence of tongue coating. The prevalence of in the present study was reported to be

2.8%. A prevalence of 9.2% has been reported by Darwazeh et al. in the Jordanian population.<sup>[29]</sup>

## **Black Hairy Tongue:**

Black hairy tongue (BHT) [Figure 3] is a benign clinical condition characterized by elongated filiform papillae with a characteristic carpet-like appearance. The name is a misnomer, derives from its classical presentation as a superficial black and hairy carpet-like linguistic enhancement.<sup>[23]</sup> Predisposing factors include smoking, excessive coffee, black tea consumption, poor oral hygiene, trigeminal neuralgia, weakness, xerostomia, drug use leading to an increased prevalence of BHT in both male & female patients. BHT commonly affects the dorsum of the tongue, which is lined anteriorly by complete keratinized epithelium and posteriorly by nonkeratinized stratified squamous epithelium. Lingual papillae are protrusions of the dorsal mucosa on the anterior part of the tongue. The underlying lamina propria is composed of dense fibrous connective tissue with numerous vessels and nerves supplying the papillae. <sup>[24]</sup> The differential diagnosis includes "pseudohairy tongue", oral hairy leukoplakia, pigmented fungiform papillae of the tongue and acanthosis nigricans.<sup>[25]</sup> The present study was conducted to achieve the highest prevalence of BHT and to assess the possible association between age, sex, systemic conditions and the occurrence of tongue BHT. The findings of the present study 2.8 % which was less with those reported in the Jordanian population (5.8%). However, also it is less when compared to the Libyan population, which reported a prevalence of 4.4% [29]

# Ankyloglossia (Tongue Tie)

Ankyloglossia (AG) [Figure 3] is a congenital oral disorder that can cause decreased mobility of the tip of the tongue. The etiology of AG includes both genetic

and environmental factors including an abnormally short, thick lingual frenulum, the membrane connecting the underside of the tongue to the floor of the mouth.<sup>[26]</sup> An inherited condition that has been reported to cause AG is epidermolysis bullosa (EB) and specifically the recessive dystrophic subtype. EB is characterized by soft tissue abscesses, which result in tissue separation and scarring. As a result, adhesions develop resulting in decreased tongue mobility. [27] Other syndromes are: Opitz, orofacial digital, Beckwith-Wiedemann, Simpson-Gollabiebehemel, van der Woud, and Pierre-Robin. <sup>[28]</sup> There are two types of surgical approaches, frenotomy and frenectomy. Frenotomy, frees the frenulum, while a frenectomy removes the frenum completely. The present study was conducted for the most comprehensive conclusion of tongue tie and to evaluate the possible association between the occurrence of tongue tie with age, sex, systemic disease. The prevalence of ankyloglossia in the present study was 9.8%. The prevalence of ankyloglossia in various studies has been estimated to be 0.1%-3.7%. which was higher in present study. [29]

### Limitations

- To confirm diagnosis of systemic disease requires additional examinations like laboratory investigations.
- Improper medical history or less awareness and knowledge may give false diagnosis.

#### **Future Prospects**

Patient with not or low aware about the tongue lesions are alarming situation for systemic diseases. Most of the tongue lesions are warning sign of systemic disease, which provides valuable clues for early recognition and diagnosis of systemic disease. In this study required information for diagnosis will be obtained from small budget, less time and with the help of advanced technology scan also.

## Conclusion

The prevalence of tongue lesions was higher in males than females. Fissured tongue was the most common lesion, while black hairy tongue and coated tongue were the least common lesions, but coated tongue was not at least one in some previous literature. The prevalence of benign migrating tongue was significantly decreasing with age, while the prevalence of fissured tongue was significantly increasing with age. Subject interviews revealed relatively low awareness about the existence of tongue lesions, as none of the subjects were aware of their tongue lesions.

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# Legend Graphs & Figures



Graph 1: Shows tongue lesions of male and female. **Note:** All patients were asymptomatic.



Graph 2: Shows age related to prevalence of the tongue lesions.

**Note:** All are asymptomatic and without systemic disease except one Black tongue (drug induced) with anemia.



Figure 1: Fissured tongue & geographic tongue







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Figure 3: Black hairy tongue& ankyloglossia