

## Prevalence of Fissured Tongue in a South Indian Population - A Cross-Sectional Study

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### Abstract

**Background:** Tongue is an indicator of oral and general health. Fissured tongue is a common normal variant which does not require any treatment. Clinically, fissures are of varying depth up from 2 mm to 6 mm usually on the dorsal aspect at times extending onto the margins.

**Objectives:** The objectives of the study are: 1. To determine the prevalence of fissured tongue, 2. To assess the most prevalent pattern of fissured tongue in patients visiting a dental school, 3. To assess the possible association between the occurrence of fissured tongue with age, sex, habits, symptoms and medical illness.

**Methods:** A cross sectional study was conducted among 500 patients, who visited the OPD of a dental school in South India. Fissured tongue was diagnosed clinically based on the presence of grooves on the dorsal and lateral aspects of the tongue and also the pattern of fissure. The subjects were interviewed for their habit history, symptoms related to tongue lesions and medical history.

**Statistical analysis:** Chi square test was done to assess the relation between fissured tongue with age, sex, habits, symptoms and medical illness.

**Results:** Out of the 500 patients screened, fissured tongue was present in 65 cases. 44 were males and 21 were females. Overall tongue fissures were present in 13%. The fissures were found to be least in the 10-20 year age group, 2 (3.07%) and it was most prevalent in the 21-40 age group, 25 (38.46%), followed by 41-60, 22 (33.84%) and 61-80, 16 (24.61%) years of age. The most prevalent pattern of fissure was found to be central longitudinal fissuring, 32 (49.23%), followed by transverse fissures arising from a central fissure 10 (15.38%), then type I, 9 (13.84%) type V, 9 (13.84%), type VI, 4 (6.15%) and type III, 1 (1.53%). The least prevalent pattern was type III, double fissures. In our study 100% of our patients were asymptomatic. In our study 20% and 13.8% of fissured tongue was found in patients with diabetes mellitus and hypertension. There was no significant association of fissured tongue with systemic conditions. Prevalence of fissured tongue in patients with tobacco chewing, tobacco smoking and alcohol intake were 4.6%, 1.5%, and 1.5% respectively.

**Conclusion:** The prevalence was seen more in the elderly age group and in the males. Central longitudinal fissuring was the most prevalent pattern seen. The fissured tongue was asymptomatic in all our patients. The occurrence of fissured tongue showed no association with any systemic conditions and habits.

**Keywords:** Tongue; Fissured tongue; Central longitudinal fissuring; Prevalence

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## Introduction

Tongue has been believed to be an indicator of health for several decades. Tongue is known as the mirror of oral and general health. Fissured tongue is an inherited disorder manifested with grooves that can vary in depth [1]. Fissure tongue is a commonly encountered tongue disorder in dental practice, it is also termed as scrotal tongue or lingua plicata often presents as groove oriented anteroposteriorly with multiple branch fissures extending laterally, which does not require treatment. The depth of the fissures ranges from 2 millimeters up to 6 mm [2].

Diagnosis of fissured tongue is based on clinical examination. The tongue has to be protruded to unfold the fissures so that the fissures are visible [2]. Variable range of prevalence rates has been reported in different parts of the world. A definite etiology does not exist but a polygenic mode of inheritance is postulated. In general fissured tongue occurs more frequently in males as compared to females [3,4] and it increases with age in both genders [5-7]. The aims of the present study were to determine the prevalence of fissured tongue, to assess the most prevalent pattern of fissured and also to assess the possible association between the occurrence of fissured tongue with age, gender, systemic conditions and habits among patients visiting the Pushpagiri College of Dental Sciences, Thiruvalla, Kerala, South India.

## Methodology

A Cross sectional study was conducted in the Department of Oral Medicine and Radiology, Pushpagiri College of Dental sciences, Thiruvalla, Kerala, South India, among 500 patients, who visited the department for various treatments. All patients who were willing to participate in the study were included in the study. Patients with limited mouth opening and patients with limited tongue protrusion were excluded from the study. Informed consent was obtained from the patient prior to the examination and was examined by a trained oral medicine specialist. Medical history of the subjects was confirmed after evaluating their recent medical records. All the participants were interviewed regarding their habits of smoking and use of smokeless tobacco and also regarding abuse of alcohol. Subjects were also interviewed regarding any symptoms like burning sensation and altered taste. The patients were divided into four groups based on their ages from birth to 80 years. The patients were seated on the dental chair and were examined using mouth mirror, straight probe and under illumination with dental chair light. They were asked to swish their mouth with sterile water before performing the intraoral examination of the tongue. The patients were asked to open the mouth and protrude the tongue as much as possible and were examined with sterile gloves. Sterile gloves were used

to hold the tip of the tongue to ease complete examination of the tongue.

Tongue examination was performed according to the guidelines by WHO and no cytology or biopsy was performed. All the participants were examined for the presence or absence of fissure and also regarding the type of fissured tongue. When fissures were present, depending on the pattern of fissure, they are classified into the following types based on the classification given by AG Farman in 1976.

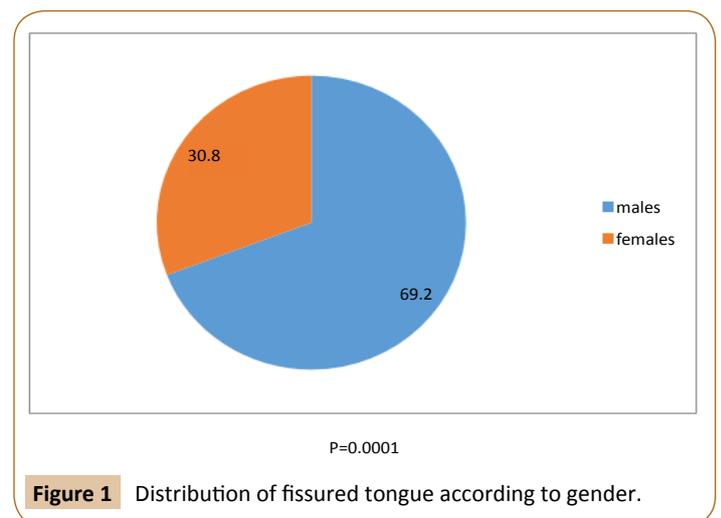
- Type I - Placation
- Type II - Central longitudinal fissure
- Type III - Double fissure
- Type IV - Transverse fissure from a central fissure
- Type V - Transverse fissure without a central fissure
- Type VI - Lateral longitudinal fissure

## Results

Chi-square test was used to associate the occurrence of fissured tongue with age, gender, habits, symptoms and medical illness. The level of significance was set at  $P < 0.05$ .

A total of 500 patients whose age ranged from 0-80 years, with a mean age of  $41 \pm 17.0$  were examined. Of these, 55.6% were females and 44.4% were males. Only 13.0% of the patients had fissured tongue.

The fissures were found to be least in the 0-20 year age group, 2(3.07%) and it was most prevalent in the 21-40 age group, 25(38.46%), followed by 41-60, 22(33.84%) and 61-80, 16(24.61%) years of age as shown in **Table 1**. The prevalence of fissured



**Table 1** Distribution of type of fissures (%) according to age group (in years).

Age group (years)	Type I	Type II	Type III	Type IV	Type V	Type VI	Total
0-20	0	1.5	0	0	1.5	0	3.0
21-40	1.5	23.1	1.5	4.6	6.3	0	37.0
41-60	3.0	17.0	0	9.3	1.5	4.6	35.4
61-80	7.7	9.3	0	1.5	4.6	1.5	24.6
Total	12.2	50.9	1.5	15.4	13.9	6.1	100

tongue was higher among males 44(67.69%) as compared to females, 21(32.30%) and was found to be statistically significant ( $P<0.0001$ ) (**Figure 1**). Most common site of occurrence was anterior and middle portions of the tongue. The most prevalent pattern of fissure was found to be central longitudinal fissuring, 33(50.76%), and the double fissuring was found to have the least prevalence. In our study all the patients were asymptomatic. There was significant association of fissured tongue with systemic conditions like diabetes and hypertension ( $p=0.0001$ ) (**Table 2**). Only 1.1% of the patients having fissured tongue had habits of tobacco smoking, chewing tobacco and alcohol intake and had no significant association with fissured tongue.

## Discussion

Fissured tongue is a benign condition which is asymptomatic, and is usually seen in general population. The exact etiology is not completely known; a polygenic or autosomal dominant hereditary component is presumed [2]. However, the difference in prevalence observed in different age groups suggests that fissured tongue is not of genetic origin [5]. It affects both genders, but some studies have shown a male predilection [8] which was similar to our study

The prevalence of fissured tongue varies and various authors have published data based on the study done in different parts of the world. In our study the prevalence was 13%. This is in accordance to the observation of the study conducted by Khozeimeh and Rasti among Iranian population where they observed a prevalence of 11.8% in 1540 subjects [9]. Darwazeh and Almelaiah also found a prevalence of 11.5% among 2000 Jordanian population [3]. The studies reported in Brazil (27.3%) by Dos Santos et al. [10] and among Lybian adults (48.4%) by Byahatti and Ingafou [11] were higher compared to our study. The variations in the prevalence can be attributed to the different diagnostic criteria used by the examiners, difference in the race, ethnicity age and sex of the subjects, in addition to the difference in the methodologies used by different researchers.

Among the various age groups the 21-40 year age group had a slightly more predilection (37.0%), of fissured tongue with least prevalence among the 0-20 year age group. This was also observed by Kovac-Kovacic and Skaleric [12] and Darwazeh and Almelaiah [3]. As the age advances the prevalence also increased this can be attributed to the reduced immune response, age related atrophy of oral tissues, salivary hypofunction, vitamin deficiencies and candidiasis.

Fissured tongue was more prevalent among men than in women

**Table 2** Distribution of fissured tongue according to medical condition of the patients.

Medical condition	Frequency (%)	p value
Diabetes mellitus	20	0.0001
Hypertension	10.8	0.0001
Hypothyroidism	1.5	0.13
Asthma	1.5	0.13
Epilepsy	1.5	0.13

in our study which is in accordance with the findings of Aboyons and Ghaemma Ghami in Ljubljana and Darwazeh and Almelaiah [3] and Pillai in Jordhan. Kelsch et al. [13] and Patil et al. [4] observed only slightly more frequent occurrences in males, whereas others found a strikingly increased frequency in females Darwazeh and Almelaiah [3]. In other studies females were more affected according to Vieira-Andrade et al. [14] and Banoczy et al. [15].

In our study the most prevalent pattern of fissured tongue was central longitudinal fissuring (50.9%). The distribution of other patterns were transverse fissures from a central fissure (15.38%), type I and type V (13.84%) and type III (1.53%). The distribution pattern in our study is in accordance to the studies conducted by Omal et al. [16] where the most common pattern was central longitudinal fissuring.

In our study, all the patients with fissured tongue were asymptomatic. Fissured tongue is usually asymptomatic, but may become symptomatic if fissures retain food debris. This finding is in accordance to the study by Maloth et al. [17] were 99% were asymptomatic and only 1% had burning sensation. This finding is in contrast to the study conducted by Darwazeh and Almelaiah et al. [3] who observed that 23% of the subjects with fissured tongue reported symptoms like soreness.

In our study 20% and 10.8% of fissured tongue was found in patients with diabetes mellitus and hypertension respectively. The result of our study is in accordance to the study by Maloth et al. [17] where they observed a 22% and 19.5% of fissured tongue in patients with diabetes and hypertension. There was significant association with diabetes and hypertension and fissured tongue according to the study by Koay et al. [18]. They found a significant association between fissured tongue and systemic diseases in Malaysian patients. Studies conducted by Albrecht et al. [19] also found significant association between fissured tongue and diabetes mellitus.

In our study, we did not find any association between fissured tongue and abusive habits like tobacco chewing, tobacco smoking and alcohol intake. This finding is in accordance to the findings of Maloth et al. [17] where the prevalence of fissured tongue with habits like tobacco smoking tobacco chewing, and alcohol intake were 4.6%, 1.5%, 1.5%, and Koay et al. [18] found that 81.5% of patients with fissured tongue were non-smokers.

## Conclusion

Among the tongue lesions, fissured tongue is the most prevalent tongue lesion. Dental practitioners and health workers should be familiar with the clinical appearance, etiology and diagnosis of fissured tongue. Patients should be advised to implement dental home care on a regular basis. Brushing of the tongue should be included in the oral hygiene habits.

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