



## PREVALENCE OF GEOGRAPHIC TONGUE, FISSURED TONGUE AND MEDIAN RHOMBOID GLOSSITIS AMONG THE POPULATION OF DHARWAD DISTRICT, KARNATAKA.

### Dental Science

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### ABSTRACT

**Aim:** The purpose of this study was to determine the prevalence of geographic tongue (GT), fissured tongue (FT) and median rhomboid glossitis (MRG) and to find out the possible association of these lesions with any of the underlying diseases and habits.

**Materials and Methods:** A prevalence study was conducted for one year among the general population attending the department of oral diagnostics & was more prevalent in smokers and chewers too.

**Results:** The prevalence of tongue lesions in the general population attending SDM Hospital was 0.12%. Geographic tongue was the most common tongue lesion found. Geographic tongue was present in subjects with Hypertension, Allergy/any skin related problems and Hormonal disorders & was more prevalent in smokers and chewers too.

**Conclusion:** The prevalence of tongue lesions GT, FT, MRG among the Dharwad population was 0.12%. No significant associations were found.

### KEYWORDS

Geographic tongue, Fissured tongue, Median Rhomboid Glossitis, tongue lesions.

### INTRODUCTION

Mouth is the mirror of health. Traditionally, tongue lesions have been considered disorders of primary concern regarding oral and general health.<sup>1</sup> Various epidemiological studies have shown the prevalence of tongue lesions in different parts of the world to be approximately upto 18.5%.<sup>2</sup> According to the National Health and Nutrition Examination Survey, the point prevalence of tongue lesions is 15.5% in U.S. adults.<sup>3</sup> The prevalence of tongue lesions was 12.07% in Indian population.<sup>2</sup> These variations can be attributed to differences in the race, sex and age of the sample population as well as differences in the diagnostic criteria, methodology and sampling procedures of various studies.<sup>4</sup> The most common tongue condition is geographic tongue, followed by fissured tongue and hairy tongue.<sup>2</sup> The oral cavity environment is dynamic and is easily influenced by oral hygiene and habits. Lesion prevalence is increased in those who wear dentures or use tobacco.<sup>3</sup>

Some of the tongue lesions show an association with underlying systemic disorders. Fissured tongue has been reported to be frequently associated with diabetes mellitus. Atrophic tongue is a sign in pernicious anaemia, iron deficiency anaemia and riboflavin deficiency.<sup>5</sup> Median Rhomboid Glossitis (MRG) is commonly associated with candidial infection. However, the presence of palatal inflammation may be indicative of immunosuppression, and Human Immunodeficiency Virus (HIV) infection.<sup>3</sup> Therefore early diagnosis can aid in identification of the underlying conditions.

The present study was designed to determine the prevalence of geographic tongue, fissured tongue and MRG in Dharwad district, Karnataka and to find out the possible association of these lesions with any of the underlying diseases and habits.

### MATERIALS AND METHODS

Patients attending the Department of Oral Medicine and Radiology, SDM college of dental sciences and Hospital, which is the only dental institute drawing majority of the patients in the district were examined for the presence of geographic tongue, fissured tongue and MRG over a period of one year. About 60,000 patients were screened ranging from 20-50+ years. After obtaining the ethical clearance from the Institutional Ethical Committee and written informed consent, clinical examination of the oral cavity and tongue was done under artificial illumination on a dental chair, using a mouth mirror. 72 subjects with either geographic tongue, geographic tongue with fissured tongue or MRG were identified. A detailed family and medical history and with any habits of tobacco/smoking/alcohol was recorded. Data was then tabulated and sent for statistical analysis.

### RESULTS

The total number of subjects screened for the study was 60,000 while 72 subjects were identified with age ranging from 20 to 50+ years (Table 1) to have either geographic tongue, geographic tongue with fissured tongue or MRG. The prevalence of tongue lesions in Dharwad district, Karnataka population as per our study was 0.12%.

**Table 1: Distribution of male and females by age groups**

Age groups	Male	%	Female	%	Total	%
20-29	9	37.50	15	62.50	24	33.33
30-39	5	41.67	7	58.33	12	16.67
40-49	9	60.00	6	40.00	15	20.83
50+	14	66.67	7	33.33	21	29.17
Total	37	51.39	35	48.61	72	100.00

Chi-square=4.7153 p=0.19394

Considering the presence/ absence of habits 66.67% subjects were chewers followed by 8.33% smokers and 4.17% alcohol consumers. 27.78% of the individuals reported no habit history (Table 2).

**Table 2: Distribution of male and females by habits**

Habits	Male	%	Female	%	Total	%
Smoking	5	13.51	1	2.86	6	8.33
Chewing habits	26	70.27	22	62.86	48	66.67
Alcohol	3	8.11	0	0.00	3	4.17
None	7	18.92	13	37.14	20	27.78

Chi-square= 7.5072 P = 0.0571

Studying their medical history revealed 44 subjects did not have history of underlying systemic diseases while 28 subjects suffered with one or more systemic diseases (Table 3).

**Table 3: Distribution of male and females by Medical history**

Medical history	Male	%	Female	%	Total	%
Diabetes Mellitus	6	16.22	3	8.57	9	12.50
Hypertension	3	8.11	5	14.29	8	11.11
Breathing problems	4	10.81	2	5.71	6	8.33
Allergy / any skin related	3	8.11	4	11.43	7	9.72
GIT problems	5	13.51	0	0.00	5	6.94
Hormones	0	0.00	4	11.43	4	5.56
None	23	62.16	21	60.00	44	61.11
Total	37	51.39	35	48.61	72	100.00

Chi-square=0.0374 P = 0.9983

Geographic tongue was the most common condition as it was found in 58.33% of subjects while Geographic tongue with fissured tongue was

found in 33.33% and MRG was found in 8.33% of subjects. (Table 4) Among these lesions, 66.67% subjects were asymptomatic while only 33.33% subjects were symptomatic. Majority (37.5%) of the symptomatic lesions were present in 50+ years age range. In our study Geographic tongue was commonly found in 20-29 years age range while Geographic tongue with fissured tongue and MRG was found in 50+ years age range. (Table 5)

**Table 4: Distribution of male and females by diagnosis**

Diagnosis	Male	%	Female	%	Total	%
Geographic tongue	19	45.24	23	54.76	42	58.33
Geographic tongue + fissured tongue	15	62.50	9	37.50	24	33.33
Median rhomboid glossitis	3	50.00	3	50.00	6	8.33
Total	37	51.39	35	48.61	72	100.00

Chi-square= 1.8272 p=0.4011

**Table 5: Association of age groups with diagnosis**

Diagnosis	20-29	%	30-39	%	40-49	%	50+	%	Total
Geographic tongue	18	42.86	8	19.05	7	16.67	9	21.43	42
Geographic tongue + fissured tongue	5	20.83	4	16.67	6	25.00	9	37.50	24

**Table 7: Association between medical histories with the diagnosis**

Medical history	Geographic tongue	%	Geographic tongue + fissured tongue	%	Median rhomboid glossitis	%	Total
Diabetes Mellitus	4	44.44	5	55.56	0	0.00	9
Hypertension	5	62.50	2	25.00	1	12.50	8
Breathing problems	2	33.33	4	66.67	0	0.00	6
Allergy / any skin related	6	85.71	1	14.29	0	0.00	7

Chi-square=7.4632 P = 0.1881

## DISCUSSION

Geographic tongue/ Benign migratory glossitis was first described by Rayer in 1831, is usually an asymptomatic inflammatory disorder of the tongue mucosa that is characterized by circinate, erythematous, ulcer-like lesions of the dorsum and lateral border of the tongue due to loss of filiform papillae of the tongue epithelium. Its prevalence varies between 0.28%-14.4%. It is more commonly found in children and in females and diminishes with age.<sup>6</sup> It has been associated with several conditions such as allergy, hormonal disturbances, juvenile diabetes, Reiters Syndrome, Down syndrome, nutritional deficiencies, psychological upsets, use of oral contraceptives, Pregnancy, fissured tongue, Lichen Planus etc.<sup>6,7</sup>

According to our study, Geographic tongue was the most common lesion in our subjects afflicted with tongue lesions and more prevalent in females and young age group. In our study Geographic tongue was more prevalent in smokers and chewers. Though majority of the subjects with tongue lesions reported with no underlying disease. Geographic tongue was commonly present in subjects with Allergy/any skin related problems followed by subjects with Hormonal disorders and Hypertension. Our observations were compatible with the observations of Miloglu et al.<sup>7</sup> in Turkish population. Jainkittivong et al.<sup>8</sup>, who concluded that Geographic tongue was more prevalent in young and atopic or allergic individuals but disagreed with prevalence of geographic tongue in nonsmokers.<sup>7,3</sup>

Fissured tongue is an inherited disorder where the tongue has deep grooves which can vary in size and depth. Although a definitive etiology is unknown, a polygenic mode of inheritance is suspected because the condition is seen clustering in families who are affected. Patients are usually asymptomatic, and the condition is noted on routine intraoral examination. According to Patil S et al.<sup>2</sup> the prevalence of fissured tongue in Indian population was 14.9% while the Libyan and Brazilian population reported a higher prevalence. Fissured tongue is usually asymptomatic unless debris is entrapped within or when it occurs in association with geographic tongue. The association between fissured tongue and Geographic Tongue supports a genetic basis for the development of the condition.<sup>8,9</sup> The fissures may act as stagnation areas on the tongue surface in which glossitis may begin.<sup>9</sup> Fissured tongue has been associated with Down syndrome, acromegaly, psoriasis, and Sjögren syndrome. Melkersson Rosenthal syndrome is a rare disorder of unclear etiology that is characterized by a triad of severe fissuring, relapsing orofacial edema, and facial nerve palsy.<sup>3</sup> According to Ching et al.<sup>10</sup> a higher than expected prevalence of

Median rhomboid glossitis	1	16.67	0	0.00	2	33.33	3	50.00	6
Total	24	33.33	12	16.67	15	20.83	21	29.17	72

Chi-square= 7.2376 p=0.2995

In our study, Geographic tongue was more prevalent in smokers and in chewers while all the three lesions were equally prevalent in alcoholics (33.33%) (Table 6). Majority of the subjects with tongue lesions reported with no underlying disease. Geographic tongue was present commonly in subjects with Hypertension, Allergy/any skin related problems and Hormonal disorders. Geographic tongue with Fissured tongue was commonly present in subjects with Diabetes Mellitus, Breathing problems and GIT problem. (Table 7).

**Table 6: Association between habits with the diagnosis**

Habits	Geographic tongue	%	Geographic tongue + fissured tongue	%	Median rhomboid glossitis	%	Total
Smoking	5	83.33	0	0.00	1	16.67	6
Chewing habits	31	64.58	13	27.08	4	8.33	48
Alcohol	1	33.33	1	33.33	1	33.33	3
None	9	45.00	10	50.00	1	5.00	20

Chi-square=4.5332 P = 0.2209

Geographic Tongue and Fissured Tongue was seen among patients with Burning Mouth Syndrome. In our study the second common tongue lesion prevalent in the subjects was geographic tongue with fissured tongue. It was found commonly in 50+ age group, more prevalent in males and subjects with chewing habit. It is found commonly in association with Breathing problems, GIT problem and Diabetes mellitus. The observations by Darwazah et al.<sup>11</sup> in Jordanian population, partially disagreed with our study that fissured tongue was more prevalent in their population and agreed with prevalence of the lesion in advanced age. The reason given for this variation was differences in ethnicity, diagnostic criteria and age groups examined while advanced age has been reported to be associated with hyposalivation, which is counted as a contributory factor to the development of fissured tongue.<sup>11</sup>

Median rhomboid glossitis is characterized by a smooth, shiny, erythematous, sharply circumscribed, asymptomatic, plaque-like lesion on the dorsal midline of the tongue. According to Patil S et al.<sup>2</sup> the prevalence of MRG was reported to be 3.7% while a prevalence of 0.6% has been reported in Jordanian and Libyan population. Men are affected three times more often than women. Most persons with the condition are asymptomatic, but burning or itching is possible.<sup>3</sup> Median rhomboid glossitis is commonly associated with a candidal infection and responds to antifungals.<sup>3</sup>

In a study conducted by Fuoad<sup>12</sup> in Iraqi population concluded that, tongue lesions were found predominantly in subjects with age range from 20-59 years. Tongue lesions had slightly higher female predilection mostly on the dorsal surface of the tongue and more prevalent in smokers. According to a study by Ghabanchi J et al.<sup>13</sup> MRG is commonly associated with Diabetes Mellitus. According to our study, MRG is found predominantly in subjects who are 50+ years of age, equally prevalent in both the genders and common in subjects with chewing habit. It is seen in subjects with Hypertension and GIT problems.

Therefore according to our study the prevalence of selected tongue lesions among Dharwad population was 0.12% while Patil S et al.<sup>2</sup> and Bhattacharya PT et al.<sup>14</sup> reported 12.07% and 13.75% of prevalence of tongue lesions in Indian population. The prevalence of tongue lesions in Libyan population was 9.2%<sup>1</sup>, Jordanian population was 29.9%<sup>11</sup>, Malaysian population was 30.2%<sup>15</sup>, Hungarian population was 22.76%<sup>16</sup> and Yemeni population was 76.5%<sup>17</sup>. Based on the report of

the National Health and Nutrition Examination Survey (NHANES III), out of 17,235 people in the United States, 27.9% had oral lesions, 15.5% of which were located on the tongue while in Iranian population in a study conducted by Shamloo N et al.<sup>18</sup> out of a total of 6011 files, 211 cases of tongue lesions were identified.

## CONCLUSION

The present study determined prevalence of selected tongue lesions in the Dharwad population simultaneously assessing their association with underlying systemic disorders and tobacco habits. Lack of detailed investigations about the laboratory findings of iron or vitamin deficiencies and prevalence of Candidal carriage in patients with tongue lesions were set back for this study.

Further it is recommended that a long term study performed on more positive patients would yield an appropriate conclusion on the association of these patients with underlying medical conditions.

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