

# Prevalence of oral mucosal lesions among Pre-University students of Kodava population in Coorg District

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## ABSTRACT

**Background:** To know the prevalence of oral mucosal lesions among Pre-University students of Kodava population in Coorg District. This survey also aims to find out tobacco or other habits among students and related changes in the oral environment.

**Materials & Methods:** 900 PU students of Kodava population were included. 300 students from each taluk were randomly selected, after the consent. Questions were asked to reveal the systemic diseases, abnormal oral habits, use of tobacco & alcohol. Each student was examined for oral mucosal lesions and recording was based on WHO oral health assessment form.

**Results:** Oral mucosal lesions were similar to studies done in other population but with a slightly higher frequency of few lesions. Incidence of substance use was noted, but with no signs of significant changes in the oral mucosa.

**Conclusion:** Prevalence of oral mucosal lesions varies among each population indicating the need for study in each population to format health policy. Substance use was noted among 16-17 yr age group indicates the need for early preventive measures among adolescents to avoid future serious health problems.

**Key words:** Adolescents, Coorg, Kodava, PU students, Tobacco.

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## Introduction

Adolescents and young adults constitute a complex group in continuous biological & emotional changes, which may present various types of alterations involving the orofacial regions. Epidemiological studies can provide an important vision for understanding the prevalence, extent and severity of oral disease in population. There are relatively few systematic studies of the prevalence of such lesions in children & youth.

The developmental stages of adolescents are divided into early, middle, and late stages. Middle adolescence of 15-17 yrs commonly experiment with substances and from this early experimentation there is an increased chance that life time dependence will happen.<sup>1</sup>

Adolescents and young adults may be particularly susceptible to exposures to oral carcinogens.<sup>2</sup> In young adults, also of importance are various soft

tissue lesions of the oromaxillofacial area, indicating a wide variety of local and systemic disorders, thus stressing the importance of correct diagnosis and prompt treatment of oral lesions.<sup>3</sup> Common oral lesions found among adolescents in studies outside the country were angular cheilitis, fissured tongue, linea alba, recurrent stomatitis, herpes labialis, and tobacco and non tobacco related white lesions. Lichen planus, pemphigus vulgaris, cyst and tumours also are reported.

Till now, in India, very little epidemiologic research has been conducted into oral mucosal disorder focusing only the adolescents, though many studies have been conducted in a wide age range group concentrating more on the old adults. There is no data available on the prevalence of oral lesions among age group population of 16-17 year pre university students of mid adolescence group, in Kodava population of Coorg district.

The Kodavas are a community of about 1, 00,000 inhabiting the Coorg district in Karnataka. They are of unknown origin, are ethnically distinct, have unique facial and physical characteristics, distinct language, dress, unique lifestyle and culture of their own.

This epidemiological study is an effort to study the oral mucosal lesions in this distinct population with particular interest towards today's adolescent's future.

### Materials & Methods

The study is approved by the Institutional ethical committee of Coorg Institute of Dental Sciences.

Study population included 900 PU students of 16-17 yr age group of Kodava population in Coorg District. Coorg is divided into three taluks, 300 students from each taluk were randomly selected constituting a total of 900, after the consent from the Principal and students. Both males and females were included.

Exclusion criteria were students who refused or absent on the day of examination and who were

mentally challenged. Materials used were Sterile Mouth mirror and probe, Latex disposable examination gloves, disposable mouth mask, artificial light and digital camera.

Students who belong to Coorg population were selected and case history was taken. Questions were asked to reveal the systemic diseases, abnormal oral habits, use of tobacco and alcohol. Each student was examined using mouth mirror, probe under artificial light. Findings were recorded with help of an assistant. Intra oral photographs were taken using digital camera to support the findings. Chronic inflammatory diseases of periodontal origin were not recorded in this survey. Oral lesions with recurrent nature were recorded only if observed at the time of examination. History and lesions were recorded in a specially designed case history formats. Mucosal lesions were recorded based on WHO Oral Health Assessment Form (1997) given in Oral Health Surveys basic methods 4th edition.<sup>4</sup>

SPSS for windows (version 16.0) was employed for statistical analysis. Statistical analysis was done by Chi-Square Test and Contingency coefficient analysis (Cross tabs)

### Results

Out of 900 students, 380 had atleast one mucosal lesions at the time of the study (42.2%). Difference in oral mucosal lesions noted among males and females. Statistically significant difference was noted in few lesions. Linea alba, fissured tongue, aphthous ulcer were common in females, whereas tongue tie and traumatic ulcer was common in males.(shown in Table1).16 different mucosal lesions were diagnosed, most common were Linea alba (26.3%), followed by aphthous ulcer (16.6%), fissured tongue (15.8%), tongue tie (10.5%), frictional keratosis (8.9%), geographic tongue (6.6%), fordyces granules (5%), traumatic purpura (2.1%), traumatic ulcer (2.6%), mucocele (1.6%). (Table2, Graph 1).

**Table 1: Distribution of the Lesions According to Gender (p<0.05)**

			GENDER		Total
			Male	Female	
FINDINGS	Linea alba	Count	44	56	100
		% within GENDER	23.4%	29.2%	26.3%
	Frictional keratosis	Count	21	13	34
		% within GENDER	11.2%	6.8%	8.9%
	Tongue tie	Count	23	17	40
		% within GENDER	12.2%	8.9%	10.5%
	Aphthous ulcer	Count	28	35	63
		% within GENDER	14.9%	18.2%	16.6%
	Fissured tongue	Count	25	35	60
		% within GENDER	13.3%	18.2%	15.8%
	Melanotic macule	Count	3	2	5
		% within GENDER	1.6%	1.0%	1.3%
	Fordyce granules	Count	11	8	19
		% within GENDER	5.9%	4.2%	5.0%
	Geographic tongue	Count	7	18	25
		% within GENDER	3.7%	9.4%	6.6%
	Traumatic purpura	Count	5	3	8
		% within GENDER	2.7%	1.6%	2.1%
	Traumatic ulcer	Count	9	1	10
		% within GENDER	4.8%	.5%	2.6%
	Fibroma	Count	5	0	5
		% within GENDER	2.7%	.0%	1.3%
	Mucocele	Count	4	2	6
		% within GENDER	2.1%	1.0%	1.6%
	Oronasal fistula	Count	1	0	1
		% within GENDER	.5%	.0%	.3%
	Epithelial desquamation	Count	0	2	2
		% within GENDER	.0%	1.0%	.5%
	Stomatitis areata migrans	Count	1	0	1
		% within GENDER	.5%	.0%	.3%
	Epithelial hyperplasia	Count	1	0	1
		% within GENDER	.5%	.0%	.3%
Total		Count	188	192	380
		% within GENDER	100.0%	100.0%	100.0%

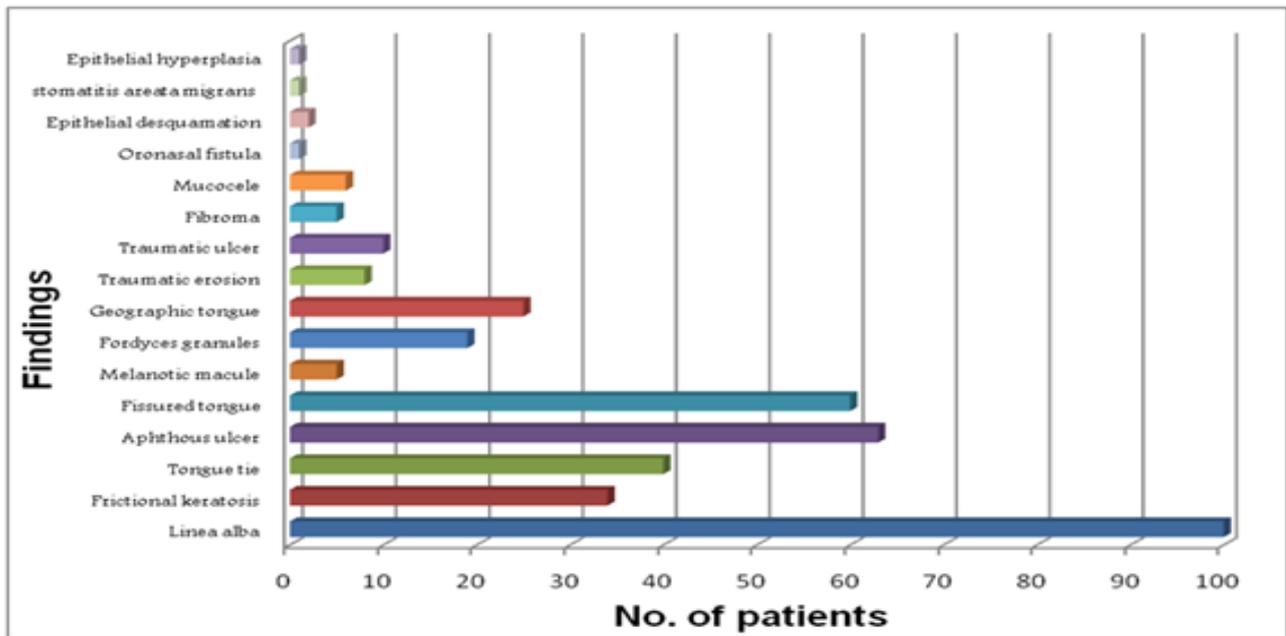
In 900 students, 32 students were found to have tobacco use in the form of cigarette (8.4%). No

other forms of tobacco use were noted. All the 32 students were boys. Cheek biting habit was noted

in 4.2% population. Majority of the population having frictional keratosis and traumatic purpura noted to have abnormal oral habit like cheek biting.

**Discussion**

The narrow age group of 16-17 yr students selected in our study was not surveyed in any of the epidemiological study except by Parlak etal



**Graph 1:** Distribution of oral mucosal lesions

**Table 2:** Findings

	Frequency	Percent
Linea alba	100	26.3
Frictional keratosis	34	8.9
Tongue tie	40	10.5
Aphthous ulcer	63	16.6
Fissured tongue	60	15.8
Melanotic macule	5	1.3
Fordyce granules	19	5.0
Geographic tongue	25	6.6
Traumatic purpura	8	2.1
Traumatic ulcer	10	2.6
Fibroma	5	1.3
Mucocele	6	1.6
Oronasal fistula	1	.3
Epithelial desquamation	2	.5
Stomatitis areata migrans	1	.3
Epithelial hyperplasia	1	.3
Total	380	100.0

who conducted study in an age group of 13-16 yr population.<sup>5</sup>

The study included the Kodava population of Coorg district. Coorg or Kodagu as it is officially known, is one of the tiniest district in the southern part of Karnataka covering an area of 4,104 Sq Km. They are ethnically and culturally distinct from the other people of South India. Kodavas have a distinct appearance among the people of South India having different cephalic and nasal index.

There are several claims regarding the origin of the Kodavas.<sup>6</sup> One view is that they may be the descendants of the brachycephalic stock who entered into the Indus Valley during the Mohenjodaro period before the Aryans and later migrated. Kodava culture resembles the culture of the ancient trading stock of Arabia. Another view is that the Kodavas are descendants of Scythians. According to another but similar view, the Kodavas belong to the Indo-Scythian race. There is also a legend that during the conquest of Alexander the Great, many of his Indo-Greek soldiers, the Yavanas, stayed back in India. They migrated as warriors down south, married the natives and settled down in the hilly areas of the Western Ghats.

These are all theories, and there isn't any definite evidence to prefer one theory over another. However, historians agree that they have lived in Coorg over 1000 years. This epidemiological study was an attempt to know the oral mucosal lesions of this distinct population and to compare these with other studies done in other countries.

Out of 900 students, 380 had atleast one mucosal lesions at the time of the study (42.2%), comparable to study by Shulman<sup>7</sup> (42%), Balog et al,<sup>8</sup> (35.11%). On other hand, prevalence is slightly higher compared to studies by, Kleiman et al,<sup>9</sup>(4%), Bessa et al, (27%),<sup>10</sup> Parlak et al,<sup>5</sup> (26.2%). The most common lesion found was Linea Alba (26.3%), followed by aphthous ulcer (16.6%), fissured tongue (15.8%), tongue tie (10.5%),

frictional keratosis (8.9%), geographic tongue (6.6%), fordyces granules (5%). The study done by Banderas et al,<sup>11</sup> showed high frequency of the lesion in a small population of age group 12-17 yrs including lichen planus, focal epithelial hyperplasia and double lip. This could be due to the different ethnic population studied, where they may be genetically susceptible for these lesions. Bessa et al<sup>10</sup> showed mucosal changes like candidiasis, due to the use of antibiotic therapy and pacifiers. These findings were not present in our study. It may be due to fact that younger age group of 0-12 yrs was included.

Study by Andrikopoulou et al<sup>3</sup> in Greek population, could find more of reactive hyperplasia lesions. This could be due to fact that study had evaluated the population over 32 yrs and wide age group. Ilker Cebeci et al<sup>12</sup> studied population including both adolescents and adults showed less number of lesions compared to our study. Most common lesions were aphthous ulcer, herpes labialis, abnormal habit related like morsicatio buccarum and frictional keratosis followed by tongue lesions. Parlak et al,<sup>3</sup> studied same number of population even though the all the lesions were of lower frequency and angular cheilitis and herpes labialis was not found in our study. These variations in the occurrence and frequency of each mucosal lesion in different studies could be due to the fact that each study was carried out in different countries and studies in one country may not produce valid estimators of prevalence in other countries. Also certain factors like age, race/ethnicity, and socioeconomic status will also account for the variation in the prevalence of each lesion.

When correlated with sex and prevalence of the lesions, there was an association in our study even though most of the studies could not correlate the gender and frequency of the lesion.

In our study, cheek biting habit was noted in 4.2% population. In a population having frictional

keratosis, 87.5% noted to have cheek biting habit while 5.5% of the population had frictional keratosis without any abnormal habit. Shulman, <sup>7</sup>(2.43%), Ilkber Cebeci et al <sup>12</sup> (4.68%), Wyk et al<sup>13</sup> studies showed lesions less than our study. Increased frequency of the lesion in our study may be related to arch form and reduced buccal corridor space.

First use of tobacco usually begins in adolescence, it is important that steps are taken to dissuade the adolescent population from initially trying tobacco products and from subsequently developing a lifetime addiction to nicotine. It was evaluated that if current tobacco use pattern continues in the US, approx 6 million youth under 18yrs of age can expect to die prematurely from a smoking related disease. Our study found that 32 students, out of 396 males with smoking habit (8.4% of population) with frequency of less than 5 cigarettes /day. Frequency was lower compared to study by Rigotti et al <sup>14</sup>(60%) and study by Centers for disease control and prevention (16%). <sup>15</sup>

Studies by Greer et al,<sup>16</sup> Tomar et al,<sup>17</sup> Offenbacher et al<sup>18</sup> Nelson et al<sup>19</sup> could find smokeless tobacco use among adolescents. This could be due to the difference in culture, ethnicity and higher economic status of the population included in our study. This study did not show similar result of the study by Poulson et al <sup>20</sup> who showed that snuff dipping is becoming increasingly popular in grade schools and on college campus (12.6%).

Our study in accordance with study by Rigotti et al<sup>14</sup> that showed that cigarettes accounted for most of the tobacco use. No girl gave a tobacco habit history in our survey. Study by Greer et al<sup>15</sup> showed use of smokeless tobacco among girls in the male to female ratio 1:0.04.

Our study did not show any similar result of survey done by Tomar et al<sup>16</sup> where he observed premalignant lesion in the oral cavity of 2.9% males and less than 0.1% of females. This could be due to large sample of 17,027 including

different nationality where he could find more of snuff use, which produced the lesions. This study is in accordance with Nelson et al<sup>18</sup> who showed that overall and demographic-specific data for adolescent boys indicate that smokeless tobacco use is increased for 12th-grade students from 1986 until the early 1990s, but has subsequently declined rapidly in all grades since then. Also tobacco use among adult and adolescent females was low and showed little change. As our study did not conclude the smokeless tobacco use from a long period of time like the former study, it is our limitation to say that whether use of tobacco use is declined in this population. But in case of smoking, various studies showed that smoking rate remain alarmingly high for adolescence of both genders eventhough our study showed comparatively lower frequency.

### Conclusion

This is the first epidemiological study conducted in Kodava population of Coorg district among 16-17 yr age group. A total of 900 PU students from each taluk were selected. Mucosal lesions were recorded based on WHO Oral Health Assessment Form (1997). The most common lesion found were Linea Alba followed by aphthous ulcer, fissured tongue, tongue tie, frictional keratosis, geographic tongue, fordyces granules, traumatic ulcer, traumatic purpura, mucocele. Specific gender predilection was noted in case of few lesions. 8.4% population was having smoking habit. There were no associated oral mucosal changes due to the tobacco use.

Study was conducted in a culturally and ethnically distinct population known as 'Kodavas' of South India and more concentrated on urban population, further studies are required to know the actual prevalence of oral mucosal lesions and substance abuse among the general population of our country. Substance use was noted among 16-

17 yr age group indicates the need for early preventive measures among adolescents to avoid future serious health problems.

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