

## Original Research Article

# Assessment of periodontal health status among Koraga tribes residing in Mangalore taluk: a cross sectional study

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## ABSTRACT

**Background:** To assess the periodontal health status among Koraga tribal community residing in Mangalore Taluk.

**Methods:** The study subjects comprised of 400 Koraga tribal's in the age range of 20-55 years living in Mangalore Taluk. The data regarding oral hygiene practices prevalent in the tribal population was collected by interviewing. Intra oral examination was carried out by using mouth mirror and CPI probe and included simplified oral hygiene index (OHI-S), community periodontal index (CPI), loss of attachment and dental aesthetic index (DAI).

**Results:** Of the total population examined, 81% brushed once daily with 34% of the subjects using tooth paste and brush as oral hygiene aid while, the rest of them used a combination, with other indigenous methods. Majority of them used tobacco in the smokeless form (36%). The oral hygiene status was poor in 56% of the subjects. The present study showed that majority of the Koragas suffered from various gingival and periodontal diseases as assessed by community periodontal index. The dental aesthetic index indicated that 37.5 % of study subjects had very severe malocclusion.

**Conclusions:** This group of people has a poor oral hygiene and periodontal status because they are deprived of the awareness and availability of treatment facilities. Their inappropriate oral hygiene practices, inadequate dental health resources and low socio-economic status are the major factors in this population to cause increased prevalence of periodontal disease.

**Keywords:** Dental aesthetic index, Koraga tribes, Oral hygiene practices, Periodontal health

## INTRODUCTION

Health is a pre-requisite for human development and is an essential component for the well-being of human race.<sup>1</sup> Oral health is considered as an integral element of general health and well-being.<sup>2</sup> The health problems of any community are influenced by the interplay of various factors like social, economic and political ones. The common beliefs, customs and practices related to health and disease in turn influence the health seeking behaviour of a community.<sup>3</sup> Despite remarkable world-wide

progress in the field of diagnostics, curative and preventive health, there are people still living in isolation in natural and unpolluted surroundings far away from civilization with their traditional values, customs, beliefs and myth intact. They are commonly known as "tribals" and are the autochthonous people of the land.<sup>4,5</sup>

Adivasis literally means "Original people of the forest" comprise a substantial indigenous minority of the population of India. India is one of the few nations in the world with a thriving tribal population. There are 537

different tribal communities spread all over India. According to the census taken in 2011 the tribal population constitute about 9.01% of the total population of the country.<sup>6</sup>

The Koragas are perhaps the poorest among the scheduled tribes in Karnataka and Kerala. Koraga is an aboriginal tribe at Dakshina Kannada and Udupi Districts in Karnataka. "Kora" the first part of their name refers to the sun and the name may have originated from their conventional worship of the sun. There is a possibility that their name is a corruption of Koruvar which in Tulu means the people of the hills.<sup>7</sup>

Though the Koragas are tribal's, they are regarded as ceremonially impure and unclean in the local Hindu Society and were considered untouchables by the main stream of social group. The Koragas are the most backward among the tribes of Karnataka State in every aspect. They speak a language close to Tulu and Kannada. A great majority of them lead on hard life and good proportion are engaged in their traditional occupations like basket making. Koragas are, a very quiet and inoffensive race, small and slight, the men seldom exceeding five feet six inches, black skinned, thick lipped, noses broad and flat, high-check bones and sloping foreheads, and with bushy rough hairs. Their principal occupation was basket making and food gathering. At present, they are engaged with many other occupations. Most of them are labourers.<sup>8</sup>

Lack of health care system is one of the serious problems among the Koragas. Some of them suffer from fatal diseases. It was reported that they are also affected by T.B, fever, typhoid, cold, skin diseases, leprosy, malaria, jaundice, typhoid, back pain, stomach pain etc.<sup>7</sup> Their access to medical and dental health care is limited because of large distance and poor transportation between the health centres. Moreover, they had an ignorant attitude regarding the oral health.

However, there are only limited literature and base line information available on the oral health status of these communities. Hence, this study is aimed to assess the periodontal health status among Koraga Tribes residing in Mangalore Taluk.

## METHODS

This cross-sectional study was conducted in 400 subjects in the age range of 20-55 years who belonged to Koraga tribal community. The list of tribal colonies in Mangalore Taluk was obtained from the tribal developing office, Kottarachowki, Mangalore. Identified tribal group was included in the study. Convenient sampling technique was adopted. Informed consent was obtained from all participants and ethical approval was obtained from the research and ethical committee at A.J institute of medical sciences, Mangalore, Karnataka, India.

Subjects for the study were selected from the following inclusion and exclusion criteria. The Pilot study was conducted on 30 subjects to determine the sample size. Sample size was calculated based on the following formulae:

$$n = \frac{Z\alpha^2 PQ}{E^2}$$

$Z\alpha^2 = 1.96$ , P is prevalence, Q is 1- P, E is percentage of P, n = 400. The level of significance will be set as < 0.05.

### Inclusion criteria

Subjects belonging to the Koraga tribal community and residing in Mangalore Taluk who were willing to participate were included.

### Exclusion criteria

Subjects residing in same geographic area but not belonging to Koraga tribal community.

The survey performa included recording of demographic data, oral hygiene practices and intra-oral examination. The sociodemographic data consist of information on age, sex, geographic location and occupation. The oral hygiene practices include brushing technique and material used. Any deleterious habits were recorded.

Intra oral examination was carried out by using mouth mirror and CPITN probe on an ordinary chair under adequate natural light by a single examiner. Oral hygiene status was assessed using simplified oral hygiene index (OHI-S), community periodontal index (CPI), to assess bleeding, calculus, periodontal pocket and Loss of attachment and dental aesthetic index (DAI), to assess the occlusal relation.

### Statistical analysis

Statistical analysis was done by using SPSS (statistical package for social sciences) version 17. All the collected data of survey was analyzed by descriptive statistical analysis.

## RESULTS

The total study population was 400 comprising of 208 females and 192 males in the age group of 20-50 years with the mean age of 38.84.

Considering the oral hygiene practices, majority of them used tooth brush and paste (34%), 27% used a combination of tooth brush and paste with mango leaves, 19% used tooth brush and paste with tooth powder, 10% used a combination of mango leaves, charcoal and powdered coconut shell and 9% used a combination of tooth powder, mango leaves, charcoal and twigs.

Of the total study subjects examined 81% brushed once daily followed by 18% who brushed twice daily, and 1% brushed more than twice.

36% of the Koragas used tobacco in the smokeless form, 34% had no habits, and 10% of them smoked beedi and 19% used tobacco in smoking and smokeless forms (Table 1).

**Table 1: Distribution of prevalence of tobacco use among study subjects.**

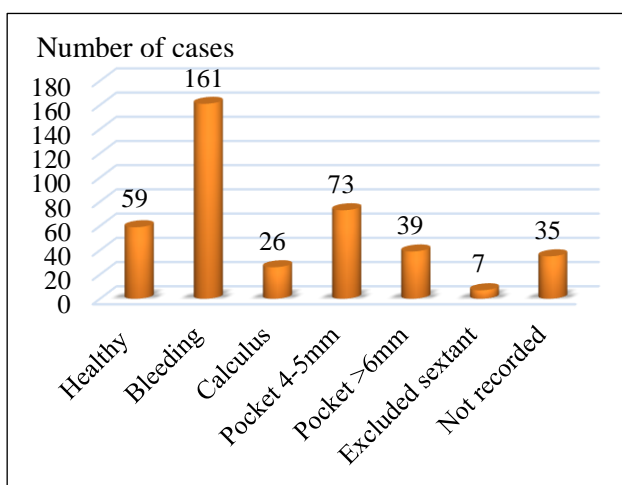
Tobacco used	Frequency	Percent
No Habit	136	34.0
Smokeless	146	36.5
Smoking	42	10.5
Smoking and smokeless	76	19.0
Total	400	100.0

The oral hygiene index scores indicated that 56% had poor oral hygiene, 41% had fair and 3% had good oral hygiene (Table 2).

**Table 2: Distribution of study subjects according to the OHI scores.**

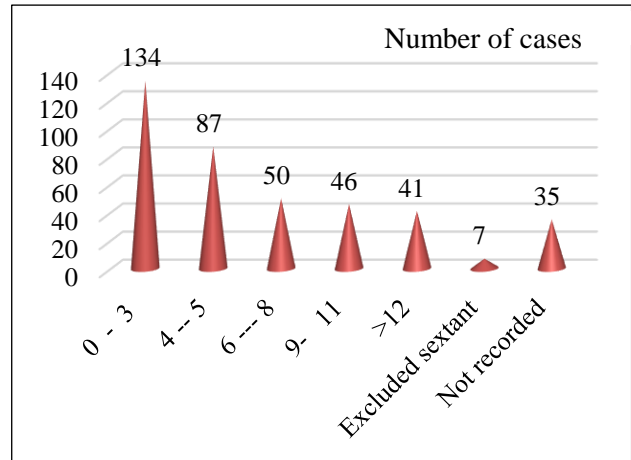
OHI-S scores	Frequency	Percent
Good	12	3
Fair	164	41
Poor	224	56
Total	400	100

Periodontal health status was assessed by community periodontal index and loss of attachment. 40.3% had bleeding gums, 18.3% had 4-5mm pockets, 9.8% had pockets which were more than 6mm and 6.5% had calculus. 14.8% of the total subjects had healthy gums (Figure 1).



**Figure 1: Bar diagram showing distribution of study subjects according to the CPI scores.**

33.5% had 0-3mm loss of attachment, 21% had 4-5mm, 12.5% had 6-8mm, 11.5% had 9-12mm, and 10.3% had 12mm or more of Loss of attachment (Figure 2).



**Figure 2: Bar diagram showing distribution of study subjects according to loss of attachment score.**

The dental aesthetic index helps in determining the severity of malocclusion. The DAI scores revealed that 37.5% had very severe or handicapping malocclusion which requires mandatory treatment, 33.8% had no abnormality or minor malocclusion which had no or slight need for treatment, 15.8% had severe malocclusion where orthodontic correction was highly desirable and 13% had definite malocclusion where treatment indication was elective.

**DISCUSSION**

Good health is crucial for socio-economic development of the people. Health is defined as “complete physical and mental fitness of an individual”. But health is one of the serious problems among the Koragas. Many of them die due to malnutrition, ignorance and superstitious beliefs. Accessibility to proper health facilities is very rare. Though there are primary health centres, its services are very limited and not easily reachable. Advanced check-up and treatments are not available and affordable to the majority of them. Health education and proper sanitary amenities are far from them.<sup>7</sup>

Epidemiological surveys have been conducted among tribal groups in many parts of the world to assess their periodontal health. In India, indigenous populations, known as Adivasi or scheduled tribes (ST), are among the poorest and most marginalized groups. The Koraga’s are also considered as the scheduled tribes and they tend to display high levels of resignation and lack the capacity to aspire; consequently, their health perceptions often do not adequately correspond to their real oral and general health needs.

Hence, this study was carried out to assess the prevalence of periodontitis among Koraga tribes aged between 20-55

years, residing in Mangalore Taluk. Koraga's represent a typical example for an aboriginal lifestyle and culture, which has recently seen the effect of civilization. They are isolated in their culture and religion. This was in accordance with a study conducted by Bhat PK and Kadanakuppe S, on Iruliga tribes residing at Ramanagar District, Karnataka, India.<sup>9</sup> A total of 400 subjects (192 males and 208 females) were examined. The subjects were selected based on inclusion and exclusion criteria.

A majority of the Koragas (34%) used tooth brush and paste for maintaining their oral hygiene, which is indicative of their change in attitude towards oral hygiene. This was in accordance with the study conducted by Khadir et al, in aborigines of Selangor, West Malaysia who reported that the majority of the population used toothbrush with toothpaste followed by other indigenous methods.<sup>10</sup>

But however, the remaining subjects continued to use other combinations of indigenous methods like 27% used a combination of tooth brush and paste with mango leaves, 19% used tooth brush and paste with tooth powder, 10% used a combination of mango leaves, charcoal and powdered coconut shell and 9% used a combination of tooth powder, mango leaves, charcoal and twigs. This practice is comparable to other populations and cultures around the world. Bhat PK and Kadanakuppe S, has reported that the chew sticks (79.8%) were more commonly used than toothbrushes as an oral hygiene aid in Iruliga tribes in Karnataka, India.<sup>9</sup> Also, Naheeda S who conducted a study among Konda Reddy tribal population, a majority of 93.60% of them cleaned, their teeth using twigs followed by only 6.20% of them cleaned their teeth with combination of toothbrush, finger and twig with toothpaste and charcoal.<sup>11</sup>

81% of the subjects brushed once daily followed by 18% who brushed twice daily, and 1% who brushed more than twice. This can be attributed to the lack of dental health care awareness. This was in accordance with the study conducted by Smith K et al, among the Western Australian indigenous communities, where 40.4% of the subjects brushed once daily.<sup>12</sup> Contrastingly, this was not in accordance with the study conducted by Vivek S et al, among the Paniyan tribal's of Wayanad District, Kerala where 57.2 % of the subjects brushed their teeth twice daily, 33.9% of the subjects brushed once daily and 8.9% of the subjects brushed once a week.<sup>13</sup>

The Koragas mainly used tobacco in the smokeless form (36%). It was observed that they always carry a small pouch which had beetel leaves and aracanut powder. 34% had no habits, and 10% of them smoked beedi and 19% used tobacco in smoking and smokeless forms. This was in accordance to the study conducted by Bhat N, in Kadukurubas where 38.50% used a combination of tobacco and pan chewing, 33.20% smoked tobacco, and 13.20% used only pan.<sup>14</sup> In contrast, another study conducted in Western Australian indigenous communities

by Smith K, 52.4% of the patients were smokers of tobacco products.<sup>12</sup> Past smokers accounted for 10.5% of the participants. Cigarettes were used by 89.1% of the smokers and past smokers, with rolled tobacco used by 11.4%. A small number of patients 'chewed' tobacco (1.3%) though did not identify themselves as smokers.

The oral hygiene status was poor in 56% of the subjects. This can be attributed to the use of tobacco, lack of awareness on oral hygiene maintenance and treatment facilities. Cifcibasi et al, in a study suggested that the toothbrushes reduced plaque scores significantly compared to the baseline scores and the subjects who do not use a proper tooth cleaning aid show worse oral health.<sup>15</sup>

The present studies showed that majority of the Koragas suffer from various gingival and periodontal diseases as assessed by Community Periodontal Index. 40.3%, 6.5%, 18.3%, 9.8% had bleeding on probing, calculus, shallow pocket and deep pocket respectively. The findings of this study were not in accordance with the study done by Edean C and Wooley S in indigenous population of the Anangu, where bleeding, calculus, pocket depth of 4 -5 mm and 6 mm or more was found in 4.7 %, 63.9 %, 15.3 % and 14.9 % of the study subjects respectively.<sup>16</sup> Also, the results were not in concurrence with the study done by Kadanakuppe S and Bhat P, where bleeding, calculus, shallow and deep pockets were present in 4.22%, 57.9%, 22% and 3.6% respectively.<sup>17</sup> The relatively high prevalence of periodontal disease among these study subjects might be due to their desire to maintain primitive lifestyles and practices. Furthermore, they exhibit poor oral hygiene and high tobacco use placing them in high risk group for periodontal destruction.

Results showed that loss of attachment of 4-5mm, 6-8mm, 9-11 mm and more than 12 mm was present among 21 %, 12.5 %, 11.5% and 10.3 % of the study subjects respectively. This was in concordance to the study conducted by Kadanakuppe S and Bhat P, on Iruliga tribes, where 22.03 %, 3.8 %, and 0.04 % of the study subjects had loss of attachment of 4-5mm, 6-8mm, and 9-11 mm respectively.<sup>17</sup> This was in also in concordance to the study conducted by Naheeda S, on Konda Reddy tribes in Bhadrachalam, Khammam District, India.<sup>11</sup> In Konda reddy the mean number of sextants with loss of attachment of 4-5 mm loss of attachment as  $2.25 \pm 1.41$ ; mean number of sextants with loss of attachment of 6-8mm was  $0.40 \pm 0.89$ ; 9-11 mm loss of attachment was found in  $0.01 \pm 0.09$  sextants and loss of attachment of 12 mm or more was not seen in any of the sextants

The increased prevalence of periodontal disease seen in this tribe could be related to their isolation from the outside world due to lack of communication, inadequacy of modern transport and educational facilities. Their inappropriate oral hygiene practices, inadequate dental health resources and low socio-economic status are the major factors in this population to cause increased

prevalence of periodontal disease.<sup>17</sup> 13%, 15 % and 37.5 % of study subjects had definite, severe and very severe malocclusion respectively. This was in accordance with the study conducted by Bhat N among the aborigines of Mysore where, prevalence of malocclusion was 11.54%.<sup>14</sup>

Contrastingly, this was not in accordance with the study done by Kadanakuppe S and Bhat P in Iruliga tribes, where only 2.8 % of study subjects had very severe malocclusion status.<sup>17</sup> This may be due to lack of knowledge about the dentition during exfoliation period of the deciduous teeth.

## CONCLUSION

Oral diseases have been associated with mankind from time immemorial, but as they are rarely life threatening, their prevention or treatment is often accorded a low priority by health policy makers. It can be concluded from the present study that, the Koraga tribes have a higher prevalence of gingival and periodontal disease. Also, it is evident that they are living a hard life and are still under the clutches of superstitious beliefs. Their poverty coupled with illiteracy and ignorance is exploited by the society.

This group of people have a poor oral hygiene and periodontal status because they are deprived of the awareness and availability of treatment facilities. There is a consensus agreement that the periodontal health status of the tribal population is very poor and worst among the primitive tribes because of their isolation, remoteness and being largely unaffected by the developmental processes going on around them. Hence, attention should be focused on improving the oral health status. More community based oral health education programs emphasizing the importance of oral health are required among these populations.

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