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Original Research

A Comparative Study of Periodontal Health Status of Tibetan Refugees Settled in Karnataka and the Local Indian Population

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Abstract:

Background: The aim of the present study was to compare and evaluate the periodontal status between the Tibetan refugees settled in Karnataka and the local Indian population, i.e., Hubli-Dharwad.

Materials and Methods: In the present study, a total of 1000 subjects, 500 Indians and 500 Tibetans above the age of 18 years were examined. They were again grouped into 4 groups based on their age. Thus, oral hygiene and periodontal status were assessed by plaque index (PI) (Silness and Loe 1964), gingival index (GI) (Loe and Silness 1963), bleeding index (Muhlemann 1971), simplified oral hygiene index (OHI-S) index (Greene and Vermillion 1964), and community periodontal index of treatment needs (CPITN) index (Animo *et al*., for WHO 1982).

Results: Indian males and females exhibited better oral hygiene than the Tibetan's. Tibetan and Indian population with regard to various age groups, it was found that Indian population had significantly better periodontal status in all the groups. Gingival recession was seen more commonly among the Indian population when compared Tibetan population, whereas oral lesions were a more prevalent among Tibetans than Indians. Comparing various indices for periodontal status GI, sulcus bleeding index and CPITN index for the overall population between Indians and Tibetans did not show any statistically significant difference, whereas PI and OHI were statistically significant ($P < 0.005$).

Conclusion: The Indian population which visited the dental college for treatment purposes had better oral hygiene and periodontal status as compared to the Tibetan population.

Key Words: Gingival recession, oral hygiene, periodontal status

Introduction

Periodontal diseases are chronic and widely prevalent. Ever since the day of Hippocrates, periodontal diseases have crippled the survival of human dentition. Human remains from the early Christian era show clear evidence of the same.[1] Periodontal disease has been considered as multifactorial diseases with the primary initiating etiology being plaque bacteria, but subsequent tissue damage is amplified by associated factors such as medical conditions, environmental factors and genetic background.[2]

When attempts are made to understand the causes of disease, there are two general approaches which may be taken. The first approach deals with the identification and tracing of the causative agent after it has entered or affected the individual. The second approach looks further ahead, where the patient is seen set in his environment and as part of a group of similar patients. This broader field of study involves consideration of many predisposing factors to disease as well as the apparent cause and is thus concerned with the frequency of the disease in the group.[3]

The entire world population can be divided into several subcategories based on their geographical location, diet, culture, and the structure of society, among other factors. As these groups were geographically isolated, they all have their own distinctive traits in terms of color, physique, physiognomy and culture. All these traits can influence the health status of individuals in general and oral health status in particular.[4]

Tibetans belong to the Mongoloid race and are considered to be a pure race. Tibetans came to India as refugees and settled down in different regions of Karnataka. There is extremely poor dental health situation among the Tibetans and their children in their new environment. Dental treatment has been unavailable except the prescription of antibiotics for acute infections or the extraction of teeth by Indian dentists when available.[5]

Hubli-Dharwad population, on the other hand, which is more than 786,000 as per the 2001 census, boasts of adequate health service facilities.

This population becomes a suitable faction for comparison with Tibetan population regarding their oral health status.

In the past few decades, there have been striking differences in the disease patterns for these sub-categories of people. The present study has been undertaken with a view to assess and compare the periodontal health status of Tibetan refugees settled in Karnataka and the local Indian population, i.e., Hubli-Dharwad.

Materials and Methods

Ethical permission from Institutions Ethical Committee had been taken before the commencement of this study. In the present study, a total of 1000 subjects, 500 Indians and 500 Tibetans above the age of 18 years were examined. A consent of study participants had been taken and their inclusion in this study was explained to them. They were again grouped into 4 groups based on their age. Thus, oral hygiene and periodontal status were assessed by plaque index (PI) (Silness and Loe 1964), gingival index (GI) (Loe and Silness 1963), bleeding index (Muhlemann 1971), simplified oral hygiene index (OHI-S) index (Greene and Vermillion 1964), and community periodontal index of treatment needs (CPITN) index (Animo *et al*., for WHO 1982).

The Indian population which visited the dental college for treatment purposes had better oral hygiene and periodontal status as compared to the Tibetan population.

Both Tibetan and Indians were divided into four groups depending on age.

Group I: 18-28 years; Group II: 29-39 years; Group III: 40-50 years; Group IV: >51 years.

Results

In the Tibetan group, there were 304 (60.8%) males and 196 (39.2%) females, whereas the Indian group consisted of 342 (68.4%) males and 158 (31.6%) females.

The oral hygiene of females was better than the males in both the populations. When the oral hygiene was compared between males of both populations and females of both populations, it was found that Indian males had better oral hygiene which was statistically significant. Indian females also exhibited better oral hygiene than the Tibetan females (Tables 1-3).

Similarly, when the comparison was done among the Tibetan and Indian population with regard to various age groups it was found that Indian population had significantly better periodontal status in all the groups, i.e. Groups I, II, III, and IV (Tables 4-7).

The mean age of the Indian population who were included in the study was 31.03 years and for Tibetan population was 40.05 years. Among the Indian population maximum were Hindus, whereas Tibetan's solely followed Buddhism.

Table 1: Comparison of Indian and Tibetan population with respect to various indices in males.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	0.9625	0.5624	−5.8185	0.0000	S
	Tibetan	1.2377	0.6399			
GI	Indian	1.4950	7.8629	1.5591	0.1195	NS
	Tibetan	0.7896	0.6522			
SBI	Indian	0.7626	0.5508	−5.1128	0.0000	S
	Tibetan	1.0482	0.8520			
OHI-S	Indian	1.7340	1.0428	−0.7025	0.4826	NS
	Tibetan	1.7958	1.1960			
CPITN	Indian	1.2661	0.9042	−8.7802	0.0000	S
	Tibetan	1.9938	1.1956			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

Table 2: Comparison of Indian and Tibetan population with respect to various indices in females.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	0.7485	0.4886	−3.1658	0.0017	S
	Tibetan	0.9304	0.5738			
GI	Indian	0.6906	0.5525	−2.1047	0.0360	S
	Tibetan	0.8245	0.6273			
SBI	Indian	0.5689	0.4685	−4.6659	0.0000	S
	Tibetan	0.8637	0.6734			
OHI-S	Indian	1.5197	0.9476	0.8910	0.3736	NS
	Tibetan	1.4244	1.0406			
CPITN	Indian	1.0337	0.8064	−4.7228	0.0000	S
	Tibetan	1.4573	0.8640			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

Table 3: Comparison of Indian and Tibetan population with respect to various variables.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	0.9556	0.6238	−2.6550	0.0081	S
	Tibetan	1.0565	0.5759			
GI	Indian	0.9361	4.6167	−0.5860	0.5580	NS
	Tibetan	1.1079	4.6546			
SBI	Indian	0.8044	0.7110	−1.5742	0.1158	NS
	Tibetan	0.8729	0.6637			
OHI-S	Indian	1.5292	1.0433	−3.7836	0.0002	S
	Tibetan	1.7873	1.1129			
CPITN	Indian	1.4306	1.1542	−1.7433	0.0816	NS
	Tibetan	1.5455	0.9162			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

Table 4: Comparison of Indian and Tibetan population with respect to various variables in 18-28 years age group.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	0.5292	0.4483	−5.3175	0.0000	S
	Tibetan	0.9061	0.6484			
GI	Indian	0.4044	0.4701	−2.1578	0.0319	S
	Tibetan	0.5444	0.5472			
SBI	Indian	0.3465	0.4389	−4.5010	0.0000	S
	Tibetan	0.6616	0.6431			
OHI-S	Indian	0.9199	0.7547	−1.6287	0.1047	NS
	Tibetan	1.1091	1.0485			
CPITN	Indian	0.3750	0.6036	−9.8418	0.0000	S
	Tibetan	1.5109	1.1333			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

When comparing the education status, it was noticed that most of the Indians (primary 204 and secondary 200) and the Tibetans (primary 255 and secondary 213) had got their primary and secondary education. A higher education was a more prevalent among the Indian population.

Subjects in the study comprised 385 married and 115 unmarried Indians and 143 married and 357 unmarried Tibetan individuals. When comparing the diet maximum Indians where vegetarians (223), whereas maximum Tibetans preferred mixed diet (390).

Out of 500 subjects in each group 30 Indians and 110 Tibetans used tobacco in smoke form. 29 Indians and 34 Tibetans were tobacco chewers among the 500 each subject included in the study. Alcohol consumption was more prevalent in Tibetans than among the Indian populations. 51 among the Tibetan population and 17 among the Indian population where pan and betel nut chewers.

Gingival recession was seen more commonly among the Indian population when compared Tibetan population, whereas oral lesions where more prevalent among Tibetans than Indians (Table 8).

Most of the Tibetans used Colgate tooth brush, whereas Colgate and Pepsodent tooth brushes were equally prevalent among the Indian population. Tooth paste was preferred over powder among both the populations. Brushing once daily was more common among both the populations. Most of the Indians brushed their teeth for a period of 5-min, whereas maximum Tibetans brushed their teeth for the period of 2-min. Brushing horizontally was preferred over vertical and mixed strokes among both the population. Indian population showed more frequent changing of brush every 6 months.

The frequency of brushing among the Indians and Tibetans population was almost similar and its comparison was statistically insignificant. Indians brushed their teeth for a much longer duration (mean - 3.8 min) when compared to Tibetans (mean - 2.98 min). Indians changed their tooth brush more frequently (mean - 5.2 months) than Tibetans (mean - 7.7 months) (Table 9).

Comparing various indices for periodontal status GI, sulcus bleeding index and CPITN index for the overall population between Indians and Tibetans did not show any statistically significant difference, whereas PI and OHI were statistically significant ($P < 0.005$).

PI, GI, CPITN were significantly higher in Tibetan population using the tooth paste for oral hygiene maintenance when compared to the Indian population. No significant differences were found in subjects using powder in two different populations (Indian and Tibetans) (Tables 1-3).

Table 5: Comparison of Indian and Tibetan population with respect to various variables in 29-39 years age group.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	0.6925	0.4040	−5.1283	0.0000	S
	Tibetan	1.0046	0.5522			
GI	Indian	0.6201	0.6261	−1.9321	0.0545	NS
	Tibetan	0.7731	0.6333			
SBI	Indian	0.4935	0.4393	−4.1208	0.0001	S
	Tibetan	0.8058	0.7297			
OHI-S	Indian	1.2831	0.7483	−1.4022	0.1621	NS
	Tibetan	1.4473	1.0828			
CPITN	Indian	1.0939	0.8528	−2.4979	0.0131	S
	Tibetan	1.3694	0.9010			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

Table 6: Comparison of Indian and Tibetan population with respect to various variables in 40-50 years age group.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	1.0109	0.4910	−1.3497	0.1783	NS
	Tibetan	1.1055	0.6434			
GI	Indian	1.6877	8.7033	1.1463	0.2527	NS
	Tibetan	0.7965	0.6515			
SBI	Indian	0.8447	0.4870	−1.6819	0.0938	NS
	Tibetan	0.9833	0.8226			
OHI-S	Indian	1.8839	0.8464	1.9131	0.0568	NS
	Tibetan	1.6432	1.1840			
CPITN	Indian	1.4203	0.7527	−2.3390	0.0201	S
	Tibetan	1.6825	1.0557			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

Table 7: Comparison of Indian and Tibetan population with respect to various variables in 51+ years age group.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
PI	Indian	1.3844	0.4422	0.3047	0.7608	NS
	Tibetan	1.3641	0.5907			
GI	Indian	2.3144	9.7049	1.6112	0.1083	NS
	Tibetan	1.0432	0.6419			
SBI	Indian	1.1517	0.3681	−2.4733	0.0140	S
	Tibetan	1.3496	0.7854			
OHI-S	Indian	2.6554	0.8214	3.6472	0.0003	S
	Tibetan	2.2271	1.0232			
CPITN	Indian	1.9286	0.4394	−4.2299	0.0000	S
	Tibetan	2.3551	0.9978			

SD: Standard deviation, PI: Plaque index, GI: Gingival index, SBI: Sulcular bleeding index, OHI-S: Simplified oral hygiene index, CPITN: Community periodontal index of treatment needs

Table 8: Distribution of study subjects in Indians (*n*=500) and Tibetans (*n*=500) according to gingival recession and oral lesions.

Clinical parameter	Indian	Tibetan	Grand total
Gingival recession			
No	474	488	962
Oral lesions	26	12	38
No	493	490	983
Yes	7	10	17

It was observed that with increase in age periodontal disease increased and oral hygiene was poor in both the groups. Tibetan population had increased periodontal disease when compared to the Indian population.

Table 9: Comparison of Indian and Tibetan population with respect to tooth brushing habits.

Variable	Group	Mean	SD	*t* value	*P* value	Significant
Frequency	Indian	1.3060	0.4699	−0.9912	0.3218	NS
	Tibetan	1.3380	0.5480			
Duration	Indian	3.8760	1.6030	9.2363	0.0000	S
	Tibetan	2.9880	1.4325			
Brush changed once in	Indian	5.2440	2.2411	−6.2154	0.0000	S
	Tibetan	7.7100	8.5840			

SD: Standard deviation

When comparing various indices for periodontal status PI, GI, sulcus bleeding index, CPITN showed statistically significant results in 18-28 years of age group, where OHI-S index showed no significance. Tibetan young adults showed marked increased values in this age group of 18-28 (Table 4).

When comparing various indices for the periodontal status of Indian and Tibetan population PI, sulcus bleeding index, CPITN, showed statistically significant results in 29-39 years of age group, where GI, OHI-S showed no significance as shown in Table 5.

In the age group from 40 to 50 years, it was seen that PI, GI, sulcus bleeding index and OHI-S index, there was no much statistically significant difference, whereas only the CPITN was statistically significant, and was higher in the Tibetan population when compared with the Indian population (Table 6).

And in the age group of 51 and above, sulcus bleeding index, OHI-S index, CPITN were significantly higher in Tibetan population when compared with the Indian population, whereas the PI and GI did not show any significance (Table 7).

Discussion

Periodontal disease is a multifactorial disease resulting in tooth loss eventually if not identified and treated at an early stage. The affliction of the disease in the population at large varies and depends on numerous factors. It is now a well-established fact that periodontal diseases result from the accumulation of microbial plaque biofilm on the tooth surfaces along the gingival margins resulting in gingivitis in the early stages and leading to attachment loss.[6]

The severity of the clinical condition depends upon various demographic factors and also the availability of dental health services. In the present study, we made an attempt to evaluate the periodontal health status of two distinct populations comprising of migrated/refugee Tibetans (Mongoloid race) and the local population of Hubli-Dharwad (Australoid race). Both the samples of populations have their own distinct identity with regards to race, religion, socio-economics, education, beliefs, oral hygiene habits and availability of dental services.

The study sample comprised 1000 subjects - 500 Indians and 500 Tibetans above the age of 18 years. The Tibetan population was selected by simple random sampling because this sampling methodology can be applied to a small population staying in a localized area and under similar living conditions. This methodology is similar to that of Olsson,[7] Cutress *et al.*, and Franz *et al.*

Löe 2000 *et al.*,[8] found that in a Norwegian population gingival recession had begun in early life and more that 60% of 20-year olds suffered from recession on the buccal surfaces of their teeth. Moreover, it had increased to 70% by age 30 and by age 50 was >90%. Whereas, in the Sri Lankan population by the age of 30 years 90% had recession and by 40 years 100% of the population had a recession. In contrast, in our study, both the study populations had a lower incidence of recession. From this data, it can be hypothesized that there is more than one type of gingival recession and can be due to various causes and the progression of which has to be ascertained further.

The overall poor level of oral hygiene prevalence, the severity of periodontal disease was higher in the Tibetan population about 93% as compared to 73% in the Indian population. The 73% affected in the Indian population may be a higher number than the actual prevalence. This maybe because the data collected was from patients who were visiting the dental college for treatment purposes and not from a sampling procedure that was carried out for the Tibetan population. The Tibetan population at Mundgod being refugees for the last 41 years (1966) has problems such as change in the environment, surroundings, way of life, culture and on support from an external agency (Government of India). A study by Robertson *et al.*,[5] on Tibetan children in Dharmashala reported a high level of plaque and calculus in all the sextants at the age of 15. The Tibetans having moved away from their natural habitat for the last 40 years has brought a dramatic change to their culture and health. The lower degree of availability of health care and especially dental treatment awareness may along with poor dental care may be the contributing factor for a poor periodontal status. Further studies have to be conducted evaluate the specific factors that influence the disease process in both of the population.

Conclusion

The prevalence and severity of periodontal disease are more in Tibetans than Indians.

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