Assessment of Prevalence of Periodontal Disease and Treatment Needs in a Factory Population in Trivandrum by CPITN System

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Abstract

Periodontal Diseases have a universal prevalence since ancient times. There are relatively few data regarding the prevalence and severity of periodontal diseases in Kerala. In the present study we aim to provide a broad insight into the prevalence rates of periodontal needs and treatment needs of a population of factory workers in Trivandrum, Kerala, by using the CPITN system. The data showed that only 0.6% of the population were free of periodontal disease, 86% exhibited calculus and shallow pathologic pockets as their worst scores, while only about 9% presented deep pathologic pockets. Treatment need requirements indicate that 95% of the sample population needed professional scaling and curettage; while only 9% needed advanced surgical care necessitating the services of a Periodontist.

Keywords: periodontal diseases, treatment needs, CPITN, Kerala

Introduction

Human beings have suffered from periodontal diseases since ancient times. The high prevalence of the periodontal disease reflects a lack of priority given to oral health by the society, and the dental profession. The CPITN system helps integrate community and professional programs to reduce the incidence of periodontal disease.[1] The CPITN system is simple, easy to use and helps international conformity. In the present study we aim to assess the prevalence rates of periodontal disease and treatment needs of a population of Government employees in Trivandrum district of Kerala, by using the CPITN system.

Methodology

An oral health survey was conducted based on the CPITN system in a Government run Press in Trivandrum, to

estimate the prevalence of periodontal disease and assess treatment needs.

Study Design: Cross sectional study

Study Location: The Government Press has a total worker population of about 600. The major chemicals encountered in the Press are carbon and allied minerals. The Press is located in the heart of the city with the majority of the workers residing within the city limits.

Study Duration: 4 months

Subjects & selection method: Subjects were selected by random sampling. Among the randomly selected subjects those who were willing to participate and had given written consent were considered for the study. A total of 265 subjects were examined by a single examiner. Questionnaires were based on predesigned proforma assessing details like age, sex, religion, income, educational status, personal habits, oral hygiene measures and past visits to dentists.

The observations were recorded based on the CPITN system using the CPITN probes. The mouth was divided into sextants. The CPITN data was tabulated according to:

1] Distribution of highest CPITN scores with age and sex. The sample population was divided into 3 age groups: 20-29 years, 30-44 years and 45-55 years age groups. Male–female comparison was done in all age groups except in the 20-29 years age group due to insufficient number of female subjects.

2] Distribution of mean number of sextants per person having individual CPITN scores.

3] Periodontal Treatment Needs – The distribution of adults by their treatment needs as derived from the CPITN scores was also tabulated. Adults with all sextants scored 0 and X were designated as not requiring periodontal treatment [TN0]. Adults with a score not exceeding 1 were designated as requiring improving oral hygiene [TN1]. Those with scores of 2 and 3 were designated as requiring calculus removal and oral hygiene improvement [TN2]; these adults were also added to those requiring TN1. But the mean no of sextants requiring TN1 were not included because a need for oral hygiene implied whole mouth care. A score of 4 indicated a need for complex periodontal care [TN3]; these adults would also need TN2 and TN1. The percentage of adults and mean number of sextants requiring treatment were thus given in the table.

4] Mean edentulousness of the population according to age – The mean number of missing teeth out of a maximum of 28 teeth was recorded for each age group. The cause for tooth loss could not be ascertained to periodontal disease alone.

5] Percentage of population who had previous visits to dentists – subjects who had consulted a dentist in the past exhibit better self-motivation to oral care and should exhibit better periodontal health. Hence the proportion of subjects who had previous visits to dentists were also recorded.

Results

The following basic information was obtained from the CPITN data regarding the prevalence and severity of periodontal disease and treatment needs of the sampled population. The data was analyzed and tabulated in the tables and graphs given below.

Table 1: Percentage distribution of subjects by age according to highest CPITN scores

Age group (years)	CPITN Code 0	CPITN Code 1	CPITN Code 2	CPITN Code 3	CPITN Code 4	CPITN Code X
20-29	1.6	6.5	72.6	17.7	1.6	0
30-44	1.1	4.4	57.8	31.1	5.6	0
45-55	0	0	27.3	54.5	15.9	2.3

Table 2: Percentage of people who have highest score & mean number of sextants per person

		Percentage of persons who have as highest score						Mean number of sextants per person					
Age Group	N	0 Healthy	1 Bleeding	2 Calculus	3 Shallow Pockets	4 Deep Pockets	X Excluded	0 Healthy	1 Bleeding	2 Calculus	3 Shallow Pockets	4 Deep Pockets	X Excluded
20-29	14	7.1	7.1	71.5	14.3	0	0	0.86	1	3.85	0.29	0	0
30-44	141	0	2.8	51.1	39.7	6.4	0	0.57	0.76	3.54	0.93	0.17	0.03
45-55	110	0	0.9	29.1	49.1	17.3	3.6	0.16	0.4	2.92	1.73	0.33	0.46

Table 3: Male: Female comparison of severity scores of Government Press population

Age Group	Sex	CPITN Codes						p-value
		0	1	2	3	4	x	
30-44	M	0.52	0.87	3.38	1	0.23	0	0.02*
	F	0.5	0.4	3.9	0.7	0.4	0.1	
45-55	M	0.1	0.3	3	1.8	0.4	0.4	0.000*
	F	0.4	0.6	2.5	1.6	0.2	0.7	

*p value <0.05 is significant (Chi square test)

According to table 2 & 3 in the young age group only 7.1% reported with fully healthy periodontium, while none had deep pathologic pockets. In the 30-44 years age group, none presented with completely heathy periodontium. Deep pathologic pockets were significantly more prevalent in males than in females. No patient was fully edentulous in this age group. The 45-55 years age group showed some significant findings in that fully edentulous sextants made their first appearance [2.6% in males and 6.1% in females]. None presented with fully edentulous jaws.

Table 2 also shows the percentage distribution of mean number of sextants per person involved with CPITN Codes 0 through 4 and X for missing sextants with age and sex. For the young adult males, a mean of 0.86 sextant per person was free of periodontal disease while none had deep pockets, nor were excluded. For the middle age group both sexes had a similar mean healthy sextant per person. But the males had almost double the mean sextant per person with bleeding after probing compared to females. Males had a mean of 0.23 sextant with deep pocket and none were excluded. Females had a mean of 0.4 sextant with deep pockets, while 0.1 sextant was recorded as excluded or missing. The results were statistically significant.

For the early old age group, the males had a mean of 0.1 healthy sextants; while 0.3, 3.0, 1.8, 0.4 and 0.4 sextants scored codes 1, 2, 3, 4 and X respectively. The females had a mean of 0.4, 0.6, 2.5, 1.6, 0.2 and 0.7 mean sextants scoring codes 0, 1, 2, 3, 4 and X. Statistical analysis

showed that the males had a much worser periodontal disease conditions than females.

Table 4 : Periodontal Treatment Need Requirements Government Press

Age Group	TN0	TN1	TN2	TN3
20-29	7.1	92.9	85.7	0
30-44	0	100	96.7	5.9
45-55	4.3	95.7	95.5	15.9

According to table 4 in the young adult group, 7.1% presented with healthy periodontium and hence needed no treatment. 92.9% requires oral hygiene instructions; of which 85.7% required further scaling and curettage. None required complex periodontal treatment. In the middle age group, 100% of the population required oral hygiene instructions. 96.7% needed scaling and curettage; while 5.9% required further complex care. In the old age group, 4.3% were fully edentulous and hence required no periodontal treatment; 95.7% needed oral hygiene instructions; 95.5%, scaling and curettage; and 15.9% advanced treatment.

The mean edentulousness increased with age. The Government Press population had a mean of 2.8 missing teeth. Also 65.6% of population in the Government Press had past visits to dentist.

Discussion

Few epidemiological studies about periodontal diseases have been reported from Kerala.[2-5] Gupta et al in 1964 surveyed the general population of Trivandrum aged 11 - 80 years and found a 100% prevalence for gingivitis from the age of 31 years onwards.[2] He also reported that 55.6% bone resorption in the 21-30 years age group; which gradually increased to 100% in 71-80 years age group. In Trivandrum, Anil and Hari et al in 1990,[3] and Jayakrishnan R[4] in 2005 conducted epidemiological studies applying the CPITN system on urban and semiurban population. Anil et al in 1990[3] conducted a study on 2756 subjects from urban and semi urban population of Trivandrum District. 80% reported calculus and shallow pockets among 25-29 years aged subjects. In 33-44 years old subjects deep pockets were noted in 33% of them. Jayakrishnan et al in 2005[4] in their study among 504 adult population in rural Trivandrum district of Kerala state reported an overall prevalence of periodontal disease as 65.3%. The prevalence of periodontal disease was highest in the 45-50 year age group.

Contemporary data on the oral health status of various classes of Indians assessed by the CPITN system are limited.[6-12] While this investigation begins to address the problem, its sample size and sampling scheme restrict generalizations. Nevertheless, in our study since the Government Press population reflects the human society in Trivandrum, certain observations about the periodontal health status of the general population in Trivandrum can be extrapolated from this survey.

The overall picture of periodontal diseases that emerged from the CPITN data collected from this population in Trivandrum resembled the CPITN data obtained from other studies. The gradual worsening of the periodontal health with increasing age reflected the chronic progressive nature of periodontal disease. The typical pattern of endemic gingivitis and calculus, and low proportion of pathologic deep pockets were reflected in our study too. But our data contrasted with the previous study conducted by Anil et al[3] on Trivandrum population by CPITN system which showed a high proportion of subjects scoring code 4. It may be due to the sample population taken from urban and semi urban areas with a wider range of socioeconomic status.

Similar to our previous study conducted on a group of factory workers in Trivandrum, calculus predominated as the worst CPITN score in the young adult age group.[5] In the middle age group, there was predominance of calculus-shallow pocket complex. Compared to the young adult group, the middle agers showed a decrease in the number of healthy individuals and those presenting with calculus and bleeding on probing. But the proportion of those with shallow and deep pockets increased. The results were comparable to the studies by Skaleric U[13] and Anil S.[3] Even though the periodontal conditions worsened with age as evident in the increased incidence of shallow and deep pockets, the proportion of those with bleeding and calculus decreased; which is a drawback of the hierarchical method of scoring in the CPITN system.

The CPITN data for the older age group showed a predominance for shallow pockets. No subjects were found fully free of periodontal disease. We noted a progressive nature of the disease with increase in age. This was similar to previous studies conducted in this dictrict.[3-5]

The young age group showed that 7.1% of population needed no treatment, but this can be attributed to the low number of sample size in this age group in the Press. 99-100% of the population belonging to middle age group required some form of periodontal treatment, while only 5.6% needed advances surgical care. In the old age group 2.4% needed no periodontal treatment, not because they were free of disease, but due to them being completely edentulous. But 16% of the old age group needed advanced periodontal care requiring the services of a periodontist.

Conclusion

The present study was undertaken to evaluate the periodontal health status of a population of factory workers from the Government Press. The CPITN data may be analyzed and tabulated to formulate the Periodontal Treatment Need System which helps us to find out the proportion of primary health workers, dental hygienists and general dental practitioners, and specialist periodontists needed to expend periodontal care to the population studied.

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