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Research Article

ASSESSMENT OF PERIODONTAL STATUS OF ONCOLOGY PATIENTS VISITING CANCER TREATMENT INSTITUTES IN UDAIPUR CITY. A DESCRIPTIVE CROSS-SECTIONAL STUDY

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ABSTRACT

Background- Oral diseases like gingivitis and periodontitis commonly remain undiagnosed in their earlier stages. Oral health is influenced by a number of general health diseases for e.g. Diabetes mellitus and Cancer. However the treatment modalities for cancer also negatively impact the normal structures along with the tumor. The present study was planned with an aim to access the periodontal health status of the oncology patients visiting cancer treatment institutes in Udaipur city. **Material and Method-** A descriptive cross-sectional study was conducted to assess the periodontal status of oncology patients visiting cancer treatment institutes in Udaipur city. 219 patients from the randomly selected institutes were included in the study. The periodontal status was recorded using the W.H.O 2013 C.P.I.T.N index and a questionnaire was recorded regarding oral health practices and adverse habits. Descriptive statistics included computation of percentages, means and standard deviations. The statistical tests applied for the analysis were Pearson's chi-square test (χ^2), One way Analysis of Variance and Stepwise multiple linear Regression analysis. For all tests, confidence interval and p-value were set at 95% and ≤ 0.05 respectively. **Results-** Among the 219 (138 males, 81 females) subjects with mean age of 47.29 ± 14.09 had a low oral hygiene awareness. Majority of the population which visited the dentist was due to pain i.e 70.77%. 79.90% were in habit of smoking cigarettes. Periodontal disease was confirmed in majority (63.47% $p < 0.05$) of the patients. A loss of attachment of 4-6 mm and 6-8 mm was demonstrated by 94 (42.92%) and 62(28.31%) of the study subjects respectively. **Conclusion-** Prevalence of periodontal disease was high. The unmet needs for treatment was also found to be high indicating a very poor awareness and availability of oral health care.

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INTRODUCTION

Background

Oral health is an important component of an individual's well-being, somehow it is not consensually defined in the literature. It is considered that a patient presents inadequate oral health only when inflammatory processes, infection, or trauma set in or poor hygiene is administered. (1)

Chronic periodontitis is known to be a multi-factorial, opportunistic inflammation of the periodontal tissue and is mostly caused by gram-negative, anaerobic bacteria.

The disease generally shows a slow progression with limited pathology at early stages. The clinical symptoms are the increase in gingival pocket depth with loss of gingival

attachment and also destruction of the underlying alveolar bone. Further clinical manifestations may include abscess formation and increased teeth mobility with subsequent teeth loss. (2)

Cancer is currently the cause of 12% of all deaths worldwide and is a significant global health problem with more than 10 million new cases and 6 million deaths each year worldwide. Among them, head and neck neoplasia (HNN) is a major form of cancer in India, accounting for 23% of all cancers in males and 6% in females. The three most common modalities used in cancer treatment are surgical resection, radio- and chemotherapy, either used singly or in combination. Although these modalities are effective in eradicating the tumor, they also negatively impact the normal head and neck structures

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surrounding the tumor. Radiation therapy has cytotoxic effects on both normal cells and malignant cells.(3)

The long-term effects include alteration in soft tissue vascularity and bone, salivary gland damage, reduction in cellularity of connective tissue, and risk of increased collagen synthesis resulting in fibrosis. The periodontium is sensitive to the effect of radiation at high doses. There is decreased vascularity thickening, and disorientation of Sharpey's fibers and widening of periodontal space have been observed. The overall effect of high-dose radiotherapy (RT) on the periodontium results in an increased risk of periodontal attachment loss and tooth loss. The rampant periodontal destruction may occur in the absence of good oral hygiene. (3) Due to the side effects upon the oral cavity, patient oral status prior to chemotherapy is important for the quality of life of these patients, because the possibilities for intervention after chemotherapy are limited.(4)

Careful clinical examination of the mouth must be performed in all visits to the medical doctor, even if the complaints are not located there. As very little progress has been observed in early diagnosis, the best approach is to reduce exposure to risk factors. Therefore, it is important to identify inflammatory disease and oral trauma in the population in general and in oral cancer patients.(1)

When antineoplastic therapy is implemented, consultation with a dental team experienced in caring for patients undergoing treatment for cancer should be recommended. Many oral conditions, such as poor oral hygiene, broken teeth, defective restorations and periodontal disease, are likely to precipitate complications during and after a course of therapy.(5)

The present descriptive study was planned with an aim to access the periodontal health status of the oncology patients visiting cancer treatment institutes in Udaipur city.

MATERIAL AND METHOD

Study Duration

This study was conducted during the months of June-August 2016 i.e a period of three months.

Study Population

The present study was conducted among the oncology patients visiting the cancer treatment institutes in Udaipur city, Rajasthan.

Study Design

The present study was a cross - sectional descriptive study design.

The information regarding the cancer treatment institutes in Udaipur was obtained and it was found that there were three cancer treatment institutes which could be included in the study on grounds of feasibility in the district.

Sample size

A sample size of 207 was calculated using the required sample size calculator. Among all the oncology patients among the randomly selected institutes, who gave informed consent and

fulfilled the eligibility criteria were included in the study. Therefore the sample size achieved was 219.

Pilot Survey

A pilot study was carried out among 30 oncology patients to determine the feasibility and practicability of the study and the time required for examination of each subject. It helped to know the practical difficulties while conducting the survey. It took around 20-25 minutes to assess each subject.

Official Permission and Ethical clearance

The study protocol was reviewed by the Ethical Committee of Pacific Dental College and Hospital and was granted ethical clearance.

An official permission to conduct the study was obtained from the administrative office of the respective cancer treatment institutes in Udaipur city.

Informed consent

After explaining the purpose and details of the study, a written informed consent was obtained from all the subjects who were willing to participate.

Training and Calibration

Before the commencement of the study, the examiner was standardized and calibrated in the Department of Public Health Dentistry by the senior faculty member to ensure uniform interpretations, understanding, and application of the codes and criteria for the diseases to be observed and recorded and to ensure consistent examination. The examiner first practiced the examination on a group of 10 subjects with a wide range of levels of disease conditions. Then the examiner and senior faculty members applied the diagnostic criteria by examining a group of 15 subjects, with a full range of disease conditions, twice on successive days. The inter examiner reliability for CPI (Community Periodontal Index) were assessed using Kappa statistics.

Eligibility criteria

Inclusion criteria

1. Voluntary participation.
2. Patients diagnosed with any type of malignancy.
3. Those who will be willing to participate and in a condition to allow for the evaluation of periodontal status without any complication

Exclusion criteria

1. Those not willing to participate in the study.
2. Edentulous patients.
3. Those unable to open their mouth.

Proforma details

A survey proforma was designed with the help of WHO Oral Health Assessment (2013) consisted of three sections:

1. General information: Demographic data including name, age, gender, date of birth, education.
2. Questionnaire assessing information regarding oral health practices and adverse habits.

- Clinical parameters: Clinical parameters assessed were Community periodontal status, Loss of attachment.

In the preformed the periodontal status of the study population was registered and scored according to advanced who 2013 guidelines.

METHODOLOGY

Before the commencement of the study, information regarding the cancer treatment institutes in Udaipur was obtained and it was found that there were three cancer treatment institutes which could be included in the study on grounds of feasibility in the district. Among them, all the oncology patients who gave informed consent and fulfilled the eligibility criteria were included in the study. Thus, the sample size was achieved to be 219.

Schedule of the survey

A survey was systematically scheduled as per the convenience of the office authorities. A detailed schedule was prepared well in advance in harmony with the office authorities. The examination was conducted during June-August 2016.

On an average, 6-7 subjects were examined each day. Although a detailed schedule plan was prepared meticulously, few adjustments and changes were called for while working it out practically.

Infection control

Disposable mouth masks and gloves were used during examination. For instruments chemical method of disinfection was followed using Korsolex (Glutaraldehyde-7 gms, 1, 6 Dihydroxy 2, 5 Dioxahexane - 9.2 gm and Polymethylol urea derivative-7.6 gm) diluted by adding 1 part to 9 parts of potable water.

Clinical assessment and data collection

The examiner visited the site on the predetermined dates according to the schedule. Authorities were requested to provide an area for examination with adequate illumination along with a table and two chairs. Table with properly arranged instruments was placed within the easy reach of the examiner. A supervisor from among the workers was requested to send the workers for examination in a controlled way. The recording assistant was allowed to sit close enough to the examiner, so that instructions and codes could be easily heard and the

Table 1 Percentage of subjects by frequency of tooth cleaning

Variables	Frequency of tooth cleaning n(%)							p- value
	Never	Once a month	2-3 times a month	Once a week	2-6 times a week	Once a day	Twice or more a day	
Age group(years)								
>45 (n=103)	0	0	0	3(3)	9(8.73)	91(88.37)	0	0.004*
45-64 (n=94)	3(3.19)	0	0	0	3(3.19)	88(93.62)	0	
65-85 (n=14)	0	0	0	0	0	14(100)	0	
< 85 (n=8)	0	0	0	0	0	8(100)	0	
Gender								
Male (n=138)	3(2.17)	0	0	0	6(4.34)	129(93.4)	0	0.0012*
Female (n=81)	0	0	0	3(3.70)	6(7.40)	72(88.9)	0	
Total (n=219)	3	0	0	3	12	201	0	

Test applied: Chi square test. *p ≤ 0.05 statistically significant.

Table 2 Percentage of subjects according to reason of last visit to dentist by age and gender

Variables	Reason of last visit to the dentist n (%)					p-value
	Consultation/ Advice	Pain or trouble with teeth, gums or mouth	Treatment/follow-up treatment	Routine check-up/treatment	Don't know/don't remember	
Age group(years)						
>45 (n=103)	10(9.70)	72(69.9)	14(13.59)	4(3.88)	3(2.93)	0.0003*
45-64 (n=94)	3(3.19)	66(70.21)	14(14.89)	6(6.38)	5(5.33)	
65-85 (n=14)	0	11(78.57)	3(21.43)	0	0	
< 85 (n=8)	0	6(75)	2(25)	0	0	
Gender						
Male (n=138)	13(6.52)	100(75.36)	25 (18.11)	0	0	0.143
Female (n=81)	0	55(61.72)	8(9.87)	10(12.34)	8(9.87)	
Total (n=219)	13(5.93)	155(70.77)	33(15.06)	10 (4.56)	8(3.68)	

Test applied: Chi square test. *p ≤ 0.05 statistically significant.

examiner could see that findings were recorded correctly. Subjects were made to sit on a chair in such a way that maximum illumination was obtained and oral cavity was examined by the examiner standing on the right side of the chair. The general information, information regarding oral hygiene practices, adverse habits and the clinical examination findings were recorded. The examination was made with the aid of a mouth mirror and CPI (Community Periodontal Index) probe according to Type III examination as described by WHO. On an average, examination of each subject took about 20-25 minutes. Duplicate examinations were conducted on 5% (n=50) of the population during the course of the study with a kappa statistic of 95%. Assessment of all the filled proforma's was done on the same day, for the completeness and accuracy of recordings. Survey findings were reported to concerned authorities after the examination on the last day of visit to site. A total of 95 subjects gave a written informed consent and were examined.

Data management and Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 17 (SPSS Inc., Chicago, Illinois, USA).

Descriptive statistics included computation of percentages, means and standard deviations. The statistical tests applied for the analysis were Pearson's chi-square test (χ^2), One way Analysis of Variance and Stepwise multiple linear Regression analysis. For all tests, confidence interval and p-value were set at 95% and ≤ 0.05 respectively.

RESULTS

Among the total of 219 subjects who participated in the survey 138(63.01) were males and 81(36.9) were females. The mean age of the study population was 47.29 ± 14.09 .

Table 1 Shows that a more than 93.62 % and 88.37 % of subjects of age group less than 45 and 45- 64, age respectively were in a habit of cleaning their teeth once daily. A significantly high number of subjects in age group 65-85 and more than 85 were in a habit of not cleaning their teeth. Majority of males and females were in habit of cleaning their teeth daily (89.1 % and 79 %). A total 17 subjects (7.7%) were in a habit of not cleaning their teeth.

Table 2 Depicts the oral hygiene awareness of the study population regarding visits to the dentist. 40 subjects (42.55%) of age group 45-64 never received dental care before. A majority of subjects 76 (34.70%) visited the dentist between 2 - 5 years. A total of 47 subjects (21.46) visited the dentist between 1-2 years. Whereas only 6 subjects (2.73%) visited the dentist in less than 6 months.

Table 3 Elicits the overall prevalence of adverse habits (tobacco products) among the study population. The consumption smoking tobacco i.e beedi and cigarette was seen among subjects 175 (79.90%). 26 (11.87%) of the subjects were in habit of smoking beedi whereas more subjects 149 (68.03%) were in the habit of smoking cigarettes. 111 (50.68%) of subjects smoked cigarettes several times a day. 38 (17.35%) subjects consumed smokeless tobacco with prevalence of subjects who were in a habit of chewing tobacco 30 (18.26%). The habit of using snuff was found in 8 (3.65%).

Table 3 Percentage of subjects using tobacco

Forms of tobacco	Frequency of consumption n (%)						Total 219 (100)
	Seldom/never	Several times a month	Once a week	Several times a week	Every day	Several times a day	
Cigarettes	20 (9.13)	0	3 (1.36)	0	15 (6.84)	111 (50.68)	149 (68.03)
Cigars	5 (2.28)	0	0	0	0	0	5 (2.28)
A pipe	1 (0.04)	0	0	0	0	0	1 (0.04)
Chewing tobacco	3 (1.36)	3 (1.36)	5 (2.28)	0	16(7.30)	3 (1.36)	30 (18.26)
Use snuff	8 (3.65)	0	0	0	0	0	8 (3.65)
Others (Beedi)	26 (11.87)	0	0	0	0	0	26 (11.87)

Table 4 Prevalence of periodontal disease among study population by age and gender

Variables	Modified Community Periodontal Index score n (%)					Prevalence of PDL disease	p-value
	Healthy gingiva	Bleeding	Pocket (4-5 mm)	Pocket (6 mm or more)	Excluded teeth		
Age group (years)							
> 45 (n=103)	0	44(42.71)	30 (29.12)	29 (28.15)	0	0	0.003
45-64 (n=94)	0	24 (25.53)	30 (31.91)	38 (40.42)	0	0	
65-85 (n=14)	0	6 (42.85)	3 (21.42)	5 (35.73)	0	0	
< 85 (n=8)	0	4 (50)	2 (25)	2 (25)	0	0	
Gender							
Male (n=138)	0	53 (38.4)	42 (30.43)	43 (31.17)	0	0	0.0019
Female (n=81)	0	27(33.33)	23 (28.39)	31 (38.28)	0	0	
Total (n=219)	0	80 (36.52)	65 (29.68)	74 (33.70)	0	0	

Test applied: Chi square test. *p ≤ 0.05 statistically significant.

Table 4 Explains the prevalence of periodontal disease among the study population by age and gender. Presence of periodontal condition was confirmed in majority of subjects 139 (63.47% p<0.05) the presence of periodontal disease was found to be in higher proportions 103 (47%) and 94 (42.92%) subjects of age group <45 and 45-64. Also males were in majority to exhibit periodontal condition 138 (63.01%) subjects as compared to 81 (36.98%) of female subjects. The result were found to be statistically significant (p<0.05). Shallow pockets (4-5mm) were demonstrated by 65 (29.68%) subjects whereas 74 (33.70%) subjects had evidence of deep pockets (6-8mm).

Table 5 Illustrates the prevalence of loss of attachment according to age and gender. Among all, loss of attachment was evidenced by 47 (21.46%) of the study subjects at 0-3 mm. A loss of attachment of 4-6 mm and 6-8 mm was demonstrated by 94 (42.92%) and 62(28.31%) of the study subjects respectively. Majority of study subjects irrespective of gender demonstrated loss of attachment of 4-6mm. loss of attachment was higher in males at 57 (41.3%) and 38 (27.53%) at 4-6 mm and 6-8 mm respectively.

Table 6 shows distribution of the study subjects according to the mean number of sextants affected by periodontal disease according to age and gender. The overall mean number of bleeding or presence of condition was 8.17 ± 6.60 , shallow pocket (4-5) were 3.27 ± 1.46 and of deep pockets (6 and more) were 2.11 ± 0.51 respectively. Mean distribution of sextant affected by presence of periodontal condition was found to be significantly higher among the age group of 4-5 mm with a value of 17.50 ± 11.92 (p<0.05).

Table 7 represents stepwise multiple linear regression analyses with CPI as the dependent variable and various independent variable. The best predictors in the descending order for CPI were oral hygiene practices, adverse habits, educational status, stage of tumor and years of age with variances of 26%, 31%, 45%, 41%, 53% respectively. The table also simulates stepwise multiple linear regression analysis with loss of attachment (L.O.A) as the dependent variable and various independent variables. The best predictors in the descending order were oral hygiene practices, adverse habits, educational status, stage of tumor and years of age with variances of 33.7%, 46.9%, 59%, 78% and 49% respectively.

Table 5 Prevalence of loss of attachment among study population by age and gender

Variables	Loss Of Attachment N (%)						p-value
	0-3 mm Score 0	4-5 mm score 1	6-8 mm score 2	9-11 mm score 3	12 mm or more score 4	Excluded sextant score 5	
Age group (years)							
> 45 (n=103)	20 (19.41)	42 (40.77)	31 (30.09)	10 (9.7)	0	0	0.0059*
45-64 (n=94)	20(21.27)	40 (42.55)	28 (29.78)	4 (6.4)	0	0	
65-85 (n=14)	4 (28.57)	9 (64.28)	1 (7.15)	0	0	0	
< 85 (n=8)	3 (37.5)	3(37.5)	2 (25)	0	0	0	
Gender							
Male (n=138)	31 (22.46)	57 (41.3)	38 (27.53)	10 (7.24)	0	0	0.037*
Female (n=81)	16 (19.75)	37 (45.67)	24 (29.62)	4 (4.96)	0	0	
Total (n=219)	47 (21.46)	94 (42.92)	62 (28.31)	14 (6.39)	0	0	

Test applied: Chi square test. *p ≤ 0.05 statistically significant

Table 6 Distribution of mean number of sextants affected by loss of attachment

Variables	Loss of attachment score (Mean ± Standard deviation)						
	0-3 mm	4-5 mm	6-8 mm	9-11 mm	12 mm or more	Excluded sextant	Not recorded
Age group (years)							
<45 (n=103)	0	0.29 ± 0.80	0.004 ± 0.06	0	0	0	0
45-64 (n=94)	0	0.15 ± 0.58	0.23 ± 0.65	0	0	0	0
65-85 (n=14)	0	0.36 ± 0.66	2.91 ± 1.8	0	0	0	0
>85 (n=8)	0	0.28 ± 0.72	0	0	0	0	0
p-value	-	0.001*	0.001*	-	-	-	-
Gender							
Male (n=138)	0	0.18 ± 0.72	0.001 ± 0.54	0	0	0	0
Female (n=81)	0	0.30 ± 0.89	0.003 ± 0.006	0	0	0	0
Total (n=219)	0	0.24 ± 0.80	0.002 ± 0.43	0	0	0	0
p-value	-	0.001*	0.001*	-	-	-	-

Test applied: One way ANOVA, t- test. *p ≤ 0.05 statistically significant.

Table 7 Stepwise Multiple Linear Regression analysis with CPI and L.O.A as a dependent variable

Model	R	R ²	F	P
CPI				
1	0.216 (a)	0.026	29.22	0.002(a)
2	0.122 (b)	0.032	26.11	0.002(b)
3	0.365 (c)	0.045	33.64	0.0013(c)
4	0.169(d)	0.041	22.97	0.002(d)
5	0.183 (e)	0.053	19.63	0.004(e)
a	Predictors: (Constant), Oral Hygiene Practices,			
b	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits			
c	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits, Educational status			
d	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits, Educational status ,Stage of Tumor			
e	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits, Educational status , Stage of Tumor, Age			
L.O.A				
1	0.144 (a)	0.337	33.59	0.006(a)
2	0.364 (b)	0.469	29.22	0.004(b)
3	0.199 (c)	0.059	31.49	0.008(c)
4	0.178 (c)	0.078	25.33	0.009(c)
5	0.169 (c)	0.049	27.81	0.0019(c)
a	Predictors: (Constant), Oral Hygiene Practices			
b	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits			
c	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits, Educational status			
d	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits, Oral Hygiene Practices, Adverse Habits, Educational status ,Stage of Tumor			
e	Predictors: (Constant), Oral Hygiene Practices, Adverse Habits, Educational status , Stage of Tumor, Age			

DISCUSSION

Poor oral health may have a profound effect on general health, and several oral diseases are related to chronic diseases.(6)

Cancer is one of the most common causes of morbidity and mortality today. Low-income and disadvantaged groups are generally more exposed to avoidable risk factors. These groups also have less access to the health services and health education that would empower them to make decisions to protect and improve their own health.(7)

Surgery, chemotherapy and radiotherapy are the options for treatment of head and neck cancers. Each modality is associated with a number of considerations related to treatment of the cancer and quality of life of the patient. When the oral cavity and salivary glands are exposed to high doses of radiation, there can be dramatic effects on the patient's oral health.(8)

Periodontitis is a chronic oral infection thought to be caused by gram-negative anaerobic bacteria in the dental biofilm.(9)Infections such as periodontal diseases may play a key role in the etiology of oral cancer. Several studies have reported associations between periodontal disease or tooth loss and risk of oral, upper gastrointestinal, lung, and pancreatic cancer in different populations.(10)

To a significant degree, the oral problems associated with antineoplastic therapy can be prevented or minimized through optimal management. A consultation with a dental team experienced in caring for patients undergoing treatment for head and neck cancer should be completed before the start of therapy.(8)

This study of the periodontal health status of the oncology patients specifically in Udaipur city is a pioneer study by itself, so a direct comparison with studies conducted on other oncology patient population is difficult; thus an attempt is made to compare the study results with other populations similar in character.

The study population was in the age range of less than 45 years. Majority of the subjects were in the age range of less than 45 and 45-64 years of age with only a small proportion belonging to the age group of 85 years and above. Furthermore only 12.7% of them had educational status above middle school level. This is in accordance with the findings of several other studies (1) who also reported a low level of education among patients suffering from different types of cancers. It reveals that the oncology patients might not have adequate knowledge about oral and periodontal health.

In our study, the frequency of tooth cleaning by the study population was prevalently once a day. More males as compared to females showed tooth cleaning frequency of once a day which is in correlation with the findings of KakuhiroFukai *et al* (1999)(11) who featured that more males were effectively doing tooth cleaning procedures. 91 % subjects of the total population were using tooth brushes and tooth paste to clean their teeth. This finding is analogous to the results reported by Sakthi *et al* (2011)(12) at Chennai, India where 76.9% of the study participants used tooth brush and toothpaste for cleaning their teeth.

Regarding the dental visits the majority of subjects never received dental care before. The common reasons for this may be lack of time, lack of treatment facility or self-analysis about their oral health that they have no need to visit the dentist as they have no problem in their teeth. The results of this study are in agreement with the study conducted among Australian population where the majority of subjects perceived that they have no problems with their teeth and never visited the dentist. (14, 15). Luzia A Marques *et al* (2008) reported that those who reported never attending dentist visits had a statistically significant oral cancer risk of 2.5 compared to those who attended annual dental visits(16). A 70.77% of subjects visited the dentist due to pain or trouble with their teeth or gums. It was similar to a study by Wong NHY *et al* (2012) (17).

The present study elicited smokeless tobacco use of 18.27% which was much lesser than that reported by Ansari *et al* (2010)(19)among his study population in Allahabad, India (66.1%). The present study demonstrated prevalence of adverse habits were increasing subsequently in old age groups as compared to younger age groups. Townsend *et al* (1994) (19) also portrayed a similar pattern and attributed this finding to the fact that young people generally have relatively low incomes with a high proportion of it available for discretionary expenditure, so that changes in income are more likely to affect their alcohol/tobacco consuming patterns.It shows tobacco users have a careless attitude or less sophisticated outlook towards their general health care, particularly to oral health. This may result in periodontal problems and high caries risk in tobacco users. Similar results were achieved by SajithVellappally *et al* (2008)(20).

Periodontal disease as assessed by Community Periodontal Index (CPI) showed that almost all of the study subjects had periodontal disease. It was almost similar that obtained in National Oral Health Survey and Fluoride mapping 2002-03 of India⁶⁵ [90.8% in 35-44 years and 64.3% in 65-74 years age groups. Oral infections are common in these patients. We have previously reported that acute periodontal infection can account for approximately 25% of all recognized acute infections that patients with cancer develop during induction. While this relatively high prevalence was likely due to intensive infection-prevention measures at other body sites, the increased monitoring of the oral cavity during periods of reduced host defences also permitted more careful analysis of the epidemiology of these infections.

The infection most likely represents an acute exacerbation of pre-existent periodontal disease. Recent literature demonstrates that pathogens normally associated with infections in myelosuppressed cancer patients, as well as indigenous oral flora, are associated with acute periodontal infections during granulocytopenia. This finding is important, since this body site has not commonly been recognized as a source for acute infection in these patients. This process should be distinguished from chronic periodontal disease, which affects most adults (75%) in this country.(21)

In our study higher bleeding scores (47%) were found in younger age group of < 45 years and the maximum prevalence of 6mm or more pocket was observed in the older age groups. Our findings were in conformity with a previous study done on Finnish population that concluded that there was progression of periodontal disease with advancing age.(22) Periodontal attachment loss was evident among the present study sample, of which, loss of attachment of 4-5 mm (42.92%) and 6-8 mm (28.31%) were most prevalent. This might have been due to lack of awareness regarding periodontal disease. Similar results were demonstrated by Douglas E. *et al* (1987) that despite the prevalence of acute periodontal infection in oncology patients, neither effective means to reduce its prevalence nor the associated microflora have been systematically evaluated.(21) The nature of the study was cross-sectional study, thus precluding the ability to draw inferences about causal relationships. Oral health status and treatment needs of the oncology patients and those with similar type of environments in the entire state could not be taken due to economic and time constraints. Duration of exposure of adverse habits was not assessed in the present study. Though the oncology patients had a high prevalence of periodontal disease other etiological factors that might increase individual susceptibility to periodontal disease could not be assessed in our study which requires an analytical study design.

CONCLUSION

The findings of the study provides with some insight into the periodontal health status of the oncology patients visiting cancer treatment institutes which may be useful in designing the investigations that aim to further explore the causes for these findings and more importantly to plan oral health promotion program implementing both preventive and curative strategies. Prevalence of periodontal disease was high. The unmet needs for treatment was also found to be high indicating a very poor awareness and availability of oral health care.

Severe nature of disease, adverse habits like tobacco and alcohol, inappropriate oral hygiene, lower awareness levels might have influenced the periodontal health status of the these patients. It can be concluded that this community has experienced a low utilization of preventive or therapeutic oral health services.

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