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Original Research

Screening the periodontal status in a group of population by using periowise® periodontal screening and recording system

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ABSTRACT
Aim of the study: Assessing the periodontal status in a group of population in and around Davangere district, Karnataka state, India by aid of Periowise Periodontal Screening and Recording system. **Materials and Methods:** A group of population aged between 18-64 years of in and around Davangere District, were selected for periodontal screening and recording. The selected group was residents of both urban and rural locality consisted a total of 946 subjects, out of 617 were male and 329 were female. A total of 5745 sextants of 946 subjects were screened by Periowise periodontal screening and the criteria's such as age, gender, diet, locality, oral hygiene practice and oral habits of the subjects were recorded. Following the observation, the data subjected to statistical analysis. **Results and Conclusion:** Based on obtained data it can be concluded that, the subjects of older age, male gender, on complete vegetarian diet, rural locality were more prone for periodontal disease and the factors such as poor oral hygiene practice, habits like smoking, betel nut and tobacco chewing act as contributing factors for the severity and prevalence of periodontal disease.
Key words: periodontal screening and recording, periowise periodontal screening and recording, periodontal epidemiology

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INTRODUCTION

Periodontal diseases are now considered as risk factors for a number of medical problems such as cardiac disease, stroke, pre-term low birth weight babies and the regulation of blood glucose levels in diabetics and also an important cause of tooth loss in adults.

Because of these risk factors, screening for periodontal disease has begun to assume the same importance in the medical community as screening for hypertension and elevated blood cholesterol.

The early detection and treatment of periodontal disease with the aid of a clinician and patient friendly screening system clearly remains as an opportunity to provide an important service to patients. As the population ages and life span increase, we can expect even higher incidence rate of periodontal disease (Burt & Co-workers 1985, Papapanou et al 1991)[1,2]. The early diagnosis and treatment of periodontal disease, as with all disease, would make treatment less complex, less costly and more predictable, there by greatly reducing its impact on the population.

In June 1992, a Periodontal Screening and Recording programme developed by the American Academy of Periodontology and American Dental Association was officially launched in United States (Landry & Jean 2002)[3]. Periodontal Screening and Recording is designed to facilitate early detection of periodontal disease with a simplified probing technique and minimum documentation. Hence, here an attempt was made to assess the periodontal status in a group of population by using Periowise Screening and Recording System.

OBJECTIVE

To assess the periodontal status in a group of population in and around Davangere District, Karnataka state, India by Periowise Screening and Recording system.

MATERIAL AND METHODS

A total of 946 subjects were screened sextant wise and the sample consisted of 5745 sextants from 617 male and 329 female subjects aged between 18-64 years. Each subject was examined with criteria such as age, gender, diet, population locality (urban/rural), oral hygiene practice and oral habits were recorded.

MATERIALS

1. A periowise screening and recording system color coded polymeric periodontal probe with the marking at 3,5,7 and 10mm (#9006102) was used (Fig 1).
2. Proforma case sheet with screening record was used.

SCREENING PROCEDURE

All the subjects were screened to assess the periodontal status in each sextant using periowise screening and recording system with the help of mouth mirror, tweezer and periowise color coded polymeric periodontal probe with an aid of adequate or artificial light.

1. All teeth were examined and recorded in respective sextants.
2. The assessment was based on clinical signs and symptoms.
3. The periodontal status around each tooth was examined to detect the Healthy gingiva (H), Gingivitis (G), Slight Periodontitis (SP), Periodontitis (P) and the observations were recorded in respective sextants.
4. All the examinations were done by a single examiner.

Technique

The screening of periodontal status by utilizing the Periowise color coded polymeric probe was initially started from the distal aspect of the most distally located tooth and proceeded towards mesial side. The probe tip was gently inserted into gingival crevice and the probe walked around 360^0 of each tooth.

While probing, if green band remained visible with no bleeding, that is Green means Go, which indicated the probing depth of <3mm and the existence of periodontal health of teeth /sextant and that sextant was recorded as Health (H) in proforma case sheet of respective patient (Fig 2).

Conversely, if the Green band remains visible, but bleeding occurs in any aspect, the teeth/sextant was recorded as Gingivitis (G) (Fig 3).

Following, if the green band is no longer visible, but probe did not reach a red mark (>3mm and <5mm), which indicated that a probing depth between 3mm and 5mm has been attained (Fig 4). In this condition the teeth/sextant was recorded as Slight periodontits (SP) (Barrington & Myron Nevins 1990)[4].

Finally, while probing if red band (≥5mm) was reached then probing was stopped, because red means stop, Which indicates the site with probing depth ≥ 5mm and the condition of teeth/sextant was recorded as Periodontitis (P) (Fig 5). Comprehensive periodontal examination and charting was performed for each subject and patients were educated by using Periowise patient education guide regarding their present periodontal status.

ARMAMENTARIUM (Fig 6)

Mouth mirrors, Periowise –Color-Coded-Polymeric-Probe with marking at 3,5,7,10mm, tweezer, Disinfectant Glutaraldehyde, Kidney tray, Cotton rolls, Gloves and Mouth mask.

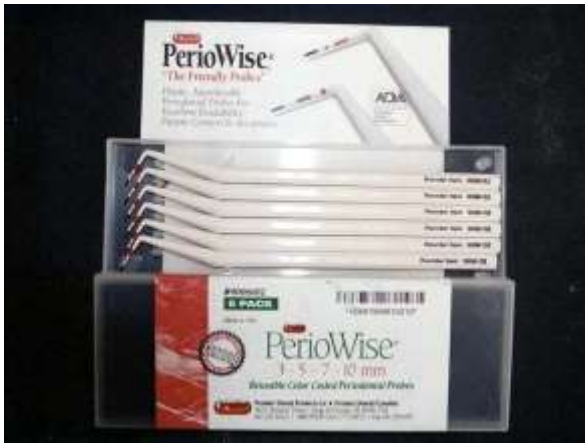

FIGURE – 1 PERIOWISE COLOR-CODED-POLYMERIC PERIODONTAL PROBE (#9006102)

FIGURE 2- PERIODONTAL STATUS- HEALTHY(H)

FIGURE 3- PERIODONTAL STATUS-GINGIVITIS(G)

FIGURE-4 PERIODONTAL STATUS-SLIGHT PERIODONTITIS(SP)

FIGURE 5- PERIODONTAL STATUS-PERIODONTITITS (P)

FIGURE 6- ARMAMENTARIUM

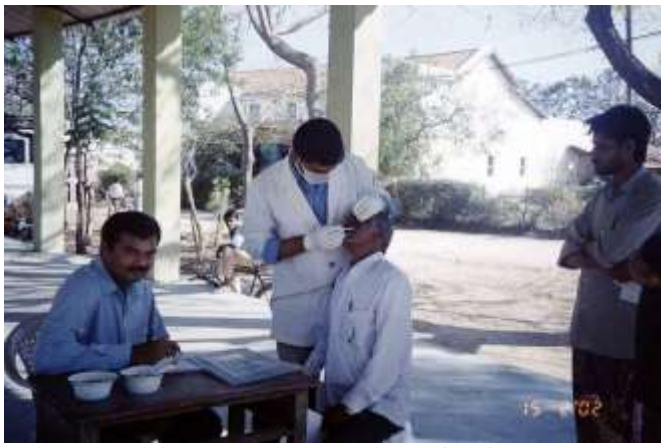

FIGURE 7- SCREENING THE POPULATION

STATISTICAL ANALYSIS

In the present the following statistical analysis used.

Test of association - Chi-square test

$X^2=\sum (O-E)^2/ E$

O=Observed frequency.

E=Expected frequency.

PROFORMA CASE SHEET

Name: **Date:**
Age: **Gender:**
Population locality: **Urban / Rural**
Diet: **Veg/ Non-Veg (mixed)**
Oral Hygiene Practice:

With Brush
With others (finger, chewing Stick and others)

Oral Habits:

Smoking
Tobacco Chewing
Pan and Betel nut chewing

Periowise ® Screening Record
Mark the sextant that has

- HEALTH (H)
- GINGIVITIS(G)
- SLIGHT PERIDONTITIS(SP)
- PERIODONTITIS (P)

Sextant (18-14)	Sextant (13-23)	Sextant (24-28)
Sextant (48-44)	Sextant (43-33)	Sextant (34-38)

Remarks

RESULTS ARE PRESENTED IN THE FORM OF TABLES (TABLES 1-6)

PERIODONTAL STATUS IN RELATION TO AGE (TABLE 1)

	Age (years)	H	G	SP	P	TOTAL (SEXTANTS
URBAN	<20	124(20.3)	409(66.8)	78(12.7)	1(0.2)	612(100)
	20-29	31(8.8)	193(54.5)	125(35.3)	5(1.4)	354(100)
	30-44	45(12.1)	149(40.1)	143(38.4)	35(9.4)	372(100)
	45-64	14(5.6)	90(36.1)	122(49.0)	23(9.3)	249(100)
	Total	214	841	468	64	1587
X^2=262.6			**df=9**		**P<0.001(HS)**	
RURAL	<20	138(37.7)	166(45.4)	60(16.4)	2(0.5)	366(100)
	20-29	295(23.4)	541(43.0)	360(28.6)	63(5.0)	1259(100)
	30-44	175(13.0)	489(36.5)	484(36.1)	193(14.4)	1341(100)
	45-64	45(3.8)	293(24.6)	400(33.6)	454(38.0)	1192(100)
	Total	653	1489	1304	712	4158
X^2=863.3			**df=9**		**P<0.001(HS)**	

Numbers in the parentheses indicate percentages

PERIODONTAL STATUS IN RELATION TO GENDER (TABLE 2)

	Gender	H	G	SP	P	TOTAL (SEXTANTS
URBAN	Male	101(10.4)	447(46.3)	364(37.7)	54(5.6)	966
	female	113(18.2)	394(63.5)	104(16.7)	10(1.6)	621
	Total	214	841	468	64	1587
X^2=108.8			df=3		P < 0.001 (HS)	
RURAL	Male	492(17.2)	994(34.7)	890(31.0)	490(17.1)	2866
	Female	161(12.5)	495(38.3)	414(32.0)	222(17.2)	1292
	Total	653	1489	130	712	4158
X^2=16.1			df=3		P < 0.01 (S)	

Numbers in the parentheses indicate percentages

PERIODONTAL STATUS IN RELATION TO DIET (TABLE 3)

	Gender	H	G	SP	P	TOTAL (SEXTANTS
URBAN	Non-Veg (Mixed)	142(13.4)	563(53.0)	312(29.4)	45(4.2)	1062
	veg	72(13.7)	278(60.0)	156(29.7)	19(3.6)	525
	Total	214	841	468	64	1587
X^2=0.38			df=3		P=0.95(NS)	
RURAL	Non-veg (Mixed)	438(17.9)	865(35.5)	752(30.8)	385(15.8)	2440
	veg	215(12.5)	624(36.3)	552(32.1)	327(19.1)	1718
	Total	653	1489	1304	712	4158
X^2=26.2			df=3		P<0.001 (HS)	

Numbers in the parentheses indicate percentages

PERIODONTAL STATUS IN RELATION TO HABITS (TABLE 4)

	Habits	H	G	SP	P	TOTAL (SEXTANTS
URBAN	No-habits	163(15.4)	643(60.7)	215(20.3)	38(3.6)	1059
	Smoking	27(11.5)	83(35.5)	105(24.9)	19(8.1)	234
	Betel nut chewing	11(8.3)	44(33.3)	74(56.1)	3(2.3)	132
	Tobacco chewing	13(8.0)	71(43.8)	74(45.7)	4(2.5)	162
	Total	214	841	468	64	1587
X^2=15.3			df=6		P<0.02(S)	
RURAL	No-Habits	372(19.8)	775(41.4)	544(29.0)	183(9.8)	1874
	Smoking	74(9.5)	213(27.4)	277(35.7)	212(27.3)	776
	Betel nut chewing	141(13.4)	330(31.5)	333(31.7)	245(23.3)	1049
	Tobacco chewing	66(14.3)	171(37.2)	150(32.7)	72(15.8)	459
	Total	653	1489	1304	1712	4158
X^2=35.5			df=6		P<0.001(HS)	

Numbers in the parentheses indicate percentages

PERIODONTAL STATUS IN RELATION TO POPULATION LOCALITY (TABLE 5)

Locality	H	G	SP	P	TOTAL (SEXTANTS
Urban	**214(13.5)**	**841(53.0)**	**468(29.5)**	**64(4.0)**	**1587**
Rural	**653(15.7)**	**1489(35.8)**	**1304(31.4)**	**712(17.1)**	**4158**
Total	**867(15.1)**	**2330(40.6)**	**1772(30.8)**	**776(13.5)**	**5745**

X^2 = 234.4 **df=2** **P < 0.001(HS)**

Numbers in the parentheses indicate percentages

PERIODONTAL STATUS IN RELATION TO ORAL HYGIENE PRACTICE (TABLE 6)

	OHP	H	G	SP	P	TOTAL (SEXTANTS)
URBAN	**Tooth brush**	**213(14.2)**	**803(53.5)**	**430(28.7)**	**54(3.6)**	**1500**
	Others	**1(1.1)**	**38(43.7)**	**38(43.7)**	**10(11.5)**	**87**
	Total	**214**	**841**	**468**	**64**	**1587**
X^2 = 30.9			**df=3**		**P < 0.001(HS)**	
RURAL	**Tooth brush**	**585(19.1)**	**1178(38.5)**	**910(29.8)**	**384(12.6)**	**3057**
	Others	**68(6.2)**	**311(28.2)**	**394(35.8)**	**328(29.8)**	**1101**
	Total	**653**	**1489**	**1304**	**712**	**4158**
X^2 = 260.2			**df=3**		**P < 0.001(HS)**	

Numbers in the parentheses indicate percentages

DISCUSSION

In the present study, 5745 sextants of 946 subjects in a group of population in and around Davangere district of Karnataka state, India were screened by utilizing a newly designed color coded probe (Periowise #9006102) and screening method (Periowise Screening and Recording).

The periodontal status was recorded based on the observations such as Health (H), Gingivitis (G), Slight Periodontitis(SP) and Periodontitis(P) in the respective sextant of the proforma case which also included criterias such as Age, Sex, Diet, Population locality (Urban/Rural), Oral habits (smoking, pan & betel nut chewing, tobacco chewing) and Oral hygiene practice.

Periodontal status in relation to Age (Table 1)

The screening observation at different age groups of both urban and rural population showed an increase in Slight Periodontits(SP) and Periodontits (P) sextants as age advanced, which was statistically highly significant (P<0.001).

The obtained observations were similar to observation of the studies by Vacher and Gupta (1967)[5], Sheiham (1970)[6], Rezy Cheru and Thelly (1976)[7], Hugoson and Zordon (1982)[8], Shanti Sivaneswaran and Barnard (1987)[9], D'Silva and Zaveri (1990)[10], Grossi (1994)[11], Petti and Co-workers (2000)[12] and Neely (2001)[13] who observed that, there was a progressive increase in the severity of periodontal disease as age increased.

Periodontal status in relation to Gender (Table 2)

The screening observation of both urban and rural population showed a better periodontal status in females than males which was statistically highly significant (P<0.001) in urban population. Whereas in rural population, the difference observed was only statistically significant (P<0.01).

The obtained observations were similar to the observation of the studies made by Waerhug (1966)[14] and WHO technical report-621 (1978)[15] according to which females had lower severity of periodontal disease than males.

But these observation were contrary to the observation made by D,Silva and Zaveri (1990)[10] and Kazimenyi and Gururaja Rao (1991)[16] who observed better periodontal status in males than females.

Periodontal status in relation to Diet (Table 3)

The screening observations of urban population revealed no significant difference (P=0.95) between the periodontal status of non-vegetarians (mixed diet) and vegetarians. Whereas, the rural population showed better periodontal status in non-vegetarians (mixed diet) than vegetarians, which was statistically highly significant (P<0.001).

The obtained observations were similar to the observation of the study conducted by Rezy Cheru and Thelly (1976)[7] who observed that, the severity of periodontal diseases was more pronounced in vegetarians than non-vegetarians.

Periodontal status in relation to Habits (Table 4)

The screening observation of both urban and rural population with habits like smoking, betel nut chewing and tobacco chewing and patients with no habits, revealed more number of Slight Periodontitis (SP) and Periodontits (P) sextants in population with habits on comparison, which was statistically highly significant in rural patients (P<0.002) and significant in urban patients (P<0.01).

The obtained observations showed that, severity of periodontal disease is associated with habits like smoking, betel nut and tobacco chewing and these observations were similar to

1. The observations of studies in relation to smoking and periodontal disease made by Markkanen (1985)[17], Bergstrom and Eliasson (1987)[18,19], D'Silva and Zaveri (1990)[10], Grossi and Co-Workers (1994)[11], Gelskey (1999)[20], Eggeret and Co-workers (2001)[21] who observed that cigarette smoking was consistently associated with an increased prevalence / severity of periodontal disease. But these observation were contrary to the observations made by Neely (2001)[13] who observed that, history of smoking not significantly associated with attachment loss.
2. The observation of on the studies in relation to betel nut chewing and periodontal disease by WHO technical report-621(1978)[15] and D'Silva and Zaveri (1990)[10] showed that, habit of betel nut chewing is associated with more periodontal destruction. But these observations were contrary to the observation made by Neely (2001)[13] who observed that, history of betel nut use was not significantly associated with attachment loss over time.
3. The observations of studies in relation to tobacco chewing and periodontal disease by Arno (1958)[22] and WHO technical report-621(1978)[15] showed that, tobacco chewing is associated with higher prevalence of periodontal disease.

Periodontal status in relation to Population locality (Table 5)

The screening observations revealed more number of slight periodontitis (SP) and Periodontitis (P) sextants in rural population on comparison, which was statistically highly significant (P<0.001).

The obtained observations were similar to the observation of the studies made by Waerhug (1966)[14] and WHO technical report -621 (1978)[15] according to which the periodontal disease was more advanced in

rural population as compared to groups of urban population.

Periodontal status in relation to Oral Hygiene Practice (Table 6)

The screening observations of both urban and rural population, revealed better periodontal status in patients using tooth brush for oral hygiene practice on comparison, which was highly significant (P<0.001).

The obtained observations were similar to the observation of the studies made by Sheiham (1970)[6], RezyCheru and Thelly (1976)[7], WHO technical report – 621 (1978)[15] and D'Silva and Zaveri (1990)[10] who observed that there was an increase in the severity of periodontal disease with poor oral hygiene practice with such as using fingers along with sand, brick powder, charcoal or others.

Conclusion

Based on the screening observations it can be concluded that the factors like older age, male gender, complete vegetarian diet, rural locality, oral hygiene practice by finger and non-dentifrices, habits like smoking, betel nut chewing and tobacco chewing were acting as the contributing factors for the severity and prevalence of periodontal disease.

Hence, increasing awareness regarding oral hygiene maintenance and deleterious oral habits in different population groups could considerably reduce the prevalence and severity of periodontal disease.

In future, further research should be undertaken to improve the predictability and reliability of the observations made.

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