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Periodontal health Status among adults affected with pre-cancerous conditions and lesions in Hyderabad city: A case-control study

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Abstract

Aim: To evaluate the periodontal-status of patients with Pre-Cancerous Condition and Pre-Cancerous lesions and compare it to that of healthy control and to compare and correlate the periodontal status of patients with Pre-cancerous condition & Pre-cancerous lesions& healthy adult patients based on age, gender & deleterious habits.

Methods: A case-control study was conducted to assess Periodontal-health Status among adults affected with Precancerous conditions & lesions in Hyderabad-city. Study participants were Adults aged 35 years and above with pre-cancerous conditions & lesions. The control group was also matches with the age & gender with case-group.The Periodontal-status was assessed by Bleeding on Probing (BOP), periodontal pockets, Loss of Attachment (LOA) using World Health Organization (WHO)-Oral Health Assessment-form for adults-2013.

Results: A total of 200 adults participated in the study, comprising of 57%males and 44%females among them 100-participants are diagnosed with pre-cancerous lesion and pre-cancerous condition(leukoplakia (35%), erythroplakia (17%), Oral sub mucous fibrosis (24%) and oral lichenplanus (24%) and 100-participants are controls with matched age and gender. High mean scores of gingival bleeding, periodontal pocket & loss of attachment was in cases compared to controls (30.1±6.7, 3.9±1.9&2.5±1.5) and there was statistical significant difference of gingival bleeding and periodontal pocket among cases and controls (p-value =0.000&0.004). There is positive correlation between age, gender, deleterious habits, precancerous-lesion, precancerous-condition and periodontal-status among them statistically significance difference was between age and periodontal pocket (p-value =0.026) and presence of lesion to gingival bleeding (p-value=0.046).

Conclusion: This study concludes that overall periodontal status was worse (poor) in precancerous lesions (leukoplakia, erythroplakia) and precancerous condition (oral submucous fibrosis, oral lichenplanus) than control group and tobacco and alcohol consumption was significant risk factor for development of precancerous lesion and condition.

Keywords: Periodontal Diseases; Precancerous Conditions; Adults; Risk Factors; Oral submucous fibrosis

Introduction

Healthy oral cavity signifies healthy well-being of an individual. Impaired oral health can affect mastication, speech, and general health of an individual. Oral mucosa is subjected to pathological changes upon local, environmental,

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Saikumar K, et al., Dent Res Oral Health 2024
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and systemic influences [1]. Oral lesions can be secondary to nutritional deficiency, trauma, infection, local irritation, ill-fitting denture, sharp tooth, electro galvanism, adverse oral habits, and systemic infections [2-5].

Some occupational exposures are associated with changes in both hard and soft tissues of oral cavity. Oral cavity is more frequently exposed to injurious agents than any other body organs. Ingestion and inhalation of foreign substances that tend to stagnate and collect within the oral cavity lead to an accumulation of irritants of a chemical, physical, or bacterial nature [1,6].

Several studies [2-5] quoted that there is a high intake of both forms of smoked and smokeless tobacco products among Indian population which is strongly associated with oral mucosal lesions. Therefore, tobacco is well-documented risk factor for the two most chronic and prevalent disease among adults, i.e., periodontal disease and oral mucosal lesions [7-10].

Periodontal diseases are the most prevalent oral microbial infections which affect the supporting tissues of the teeth. The etiopathogenesis of periodontal disease is multifactorial and recent advances in the scientific field have led to a better interpretation of the disease process [11]. A study by Tezal et al. has showed that leukoplakia, erythroplakia and non-specific ulcers to be associated with periodontal attachment loss in the American population [10].

The Oral Potential Malignant Disorder includes around 20 lesions and conditions that vary in the potential for malignant transformation. Some of they are Leukoplakia, Erythroplakia, Lichen Planus and Oral Submucous Fibrosis [9]. Global prevalence of leukoplakia and erythroplakia are 2.6% and 0.11% respectively. Thus, oral submucous fibrosis is common in Southeast Asia and its prevalence varies between 3.2-17.6%, and malignant transformation depends on the type of lesion.

Precancerous lesions include leukoplakia, erythroplakia, carcinoma in-situ. Precancerous conditions include oral submucous fibrosis, oral lichen planus and sideropenic dysphagia [10].

The study conducted by Naga SD et al revealed that Oral potential malignant disorder carry an increased risk for malignant transformation in the oral cavity [11,12]. Through mass screening, close monitoring, early detection, appropriate treatment plan and prognosis these lesions can be prevented from malignant transformation. Henceforth, the current study is planned to assess periodontal status of patients with precancerous condition and precancerous lesions and compare it to that of healthy controls.

Material and Method

A case control study was conducted to assess the Periodontal health Status among adults affected with Pre-Cancerous Condition and Lesions in Hyderabad city. Ethical endorsement was obtained from the institutional review board of xxxxxxxx xxxxxx Institute of Dental Sciences and Research Centre, Hyderabad (IEC No: PMVIDS&RC/IEC/PHD/PR/0329-19).

Study participants were Adults aged 35 years and above diagnosed pre-cancerous conditions and lesions at Department of Oral Medicine and Radiology of xxxxxxxx xxxxxx Institute of Dental Sciences and Research Centre. The control group was paired matched with the age and gender with case group. Participation was on voluntary basis, Anonymity and confidentiality of the responses was assured and consent is taken from participants.

The Periodontal status of study group and control group was assessed by bleeding on probing, periodontal pockets and loss of attachment using World Health Organization (WHO) Oral Health Assessment form for adults, 2013 [13].

The clinical examination of all the subjects was done by a single pre trained, pre calibrated examiner to limit intra-examiner variability.

Data were analyzed using Statistical Package for Social Sciences (SPSS) software (version 22.0, statistical data 2018 SPSSINC.IBM-company Chicago-USA. Chi-square test used to associate the Community Periodontal Index (CPI), Loss of Attachment (LOA) with demographic variables. Analysis of Variance (ANOVA), Tukeys-multiple posthoc procedures were used to Inter Comparison of variables with pre-malignant lesions and conditions. Independent t-test used to compare deleterious habits and premalignant lesion and condition with Periodontitis. Karl Pearson's correlation coefficient test is used for correlation of pre malignant lesions and condition with all variables. P value<0.05 was considered statistically significant.

Results

A total of 200 adults participated in the study, equal number of controls was taken in each group paired matched similar to that of cases. Majority of the study population were in age groups of >45 years (87%) and only 13% belonged to 35-44 years of age. Considering the deleterious habits only 15% controls smokes tobacco compare to cases 36% smokes tobacco, similar to this 15% of controls use smokeless form tobacco compare to 35% of cases. In alcohol consumption 7% of controls consume alcohol compare to 6% of cases. Distribution of study participants based on types of lesion among cases revealed that Leukoplakia (35%), Erythroplakia (17%), Oral submucous fibrosis (24%) and Oral lichenplanus (24%) (Table 1).

When mean scores of gingival bleeding, periodontal pocket and loss of attachment compared among the pre

Saikumar K, et al., Dent Res Oral Health 2024
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cancerous lesions and conditions, Mean Periodontal pockets were high in age group between 35-44 years (5.0±2.9) compared >45 years and there is statistical significant difference (p-value = 0.026) in the gender males had high mean than females in Gingival bleeding and periodontal pocket where as female showed high mean in loss of attachment (3± 1.6) which was not statistically significant. (p-value = 0.766) Considering the deleterious habits high mean of gingival bleeding and periodontal pocket in smoking and smokeless tobacco (30±7.4, 4±1.4) and low mean of alcohol consumption to loss of attachment(3±1.2) and which was not statistically significant. (p-value = 0.964) Results revealed gingival bleeding in oral lichenplanus showed high mean and leukoplakia showed low mean (32±0.0, 28±9.4) and there was no statistically significant difference(p-value = 0.243). Periodontal pockets are high in number in oral lichenplanus and low in oral submucous fibrosis (4.2±1.4, 3.8±2.4) and loss of attachment was high in erythroplakia and low in oral submucous fibrosis (3±1.4, 2.2±1.6) and there is no statistical significant difference found (p-value = 0.922,0.852) (Table 2).

When the mean score comparison of periodontal status among control group, high mean was showed in >45 years than 35-44 years and statistical significant difference was in periodontal pocket and loss of attachment (p-value = 0.022, 0.009), the gingival bleeding, periodontal pocket and loss of attachment was high in females than males statistical significant difference was found between females and gingival bleeding (p-value = 0.008). In deleterious habits gingival bleeding was high in participants who don't smoke, and who consumes smokeless tobacco and alcohol (25.7±6.4, 25.7±7 and 26.3±6) and there was no statistical significance difference (p-value = 0.08, 0.82 and 0.6). Periodontal pockets and loss of attachment was high in participants who don't smoke, consumes smokeless tobacco and alcohol (4.9±3.6, 5.7±5 and 4.8±2.7) and there was no statistical significance difference (p-value = 0.27,0.43 and 0.95) (Table 3).

Mean score comparison of periodontal status among cases and controls. High mean scores of gingival bleeding, periodontal pocket and loss of attachment was in cases compared to controls (30.1±6.7, 3.9±1.9 and 2.5±1.5) there was statistical significant difference of gingival bleeding and periodontal pocket among cases and controls (p-value = 0.000 and 0.004) (Table 4).

Table 1: Demographic distribution of study subjects

			Cases n(%)	Controls n(%)
Age group	35-44 years		13 (13%)	13 (13%)
	>45 years		87 (87%)	87 (87%)
Gender	Male		57 (57%)	57 (57%)
	Female		43 (43%)	43 (43%)
Smoke form of tobacco	History of use		36 (36%)	15 (15%)
	Frequency	≤10/day	34 (34%)	15 (15%)
		>10/day	2 (2%)	0
	Duration	≤ 5years	29 (29%)	0
		>5 years	7 (7%)	15 (15%)
Smokeless form	History of use		35 (35%)	8 (15%)
	Frequency	≤10/day	32 (32%)	8 (8%)
		>10/day	3 (3%)	0
	Duration	≤ 5years	29 (29%)	0
		>5 years	6 (6%)	8 (8%)
Alcohol	History of use		6 (6%)	7 (7%)
	Frequency	≤10/mth	6 (6%)	7 (7%)
		>10/mth	0	0
	Duration	≤ 5years	4 (4%)	0
		>5 years	2 (2%)	7 (7%)
Type of lesion	Leukoplakia		35 (35%)	-
	Erythroplakia		17 (17%)	-
	OSMF		24 (24%)	-
	OLP		24 (24%)	-

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Saikumar K, et al., Dent Res Oral Health 2024
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When mean score comparison of periodontal status among cases and controls based on age and gender was done the results revealed that gingival bleeding was high in cases than controls of both age groups (35-44, >44 years) and gender which was statistically significant (p-value = 0.000 and 0.000). Periodontal pockets high in cases than controls of both age groups (35-44, >44 years) and gender (male and female) and statistical significant difference was found between >45 years and female participants to periodontal pockets (p-value = 0.002, 0.007) and loss of attachment was high in males and 35-44 years than females and >45 years age and there was no statistical significance difference (p-value = 0.145,0.241 and 0.948,0.742) (Table 5).

When mean score comparison of periodontal status based on deleterious habits showed that gingival bleeding was high in cases than controls of smoking, smokeless tobacco and alcohol consumption and which was statistically significant (p = 0.003, 0.001, 0.0001). Periodontal pockets are more in smoking among the cases than control. In smokeless tobacco and alcohol consumption controls had more periodontal pockets than cases and there was statistically significance difference was showed between periodontal pockets and smokeless tobacco (p = 0.028). Loss of attachment was high in smoking, smokeless tobacco and low in alcohol consumption among the cases than controls which was not statistically significant (p = 0.080, 0.713, 0.264) (Table 6).

There was a positive correlation between age, gender, deleterious habits, pre cancerous lesion, precancerous condition and periodontal status among them statistically significance difference was between age and periodontal pocket (p-value = 0.026) and presence of lesion to gingival bleeding (p-value = 0.046). In controls a positive correlation was showed between age, gender, deleterious habits and periodontal status a statistically significance difference is between age and periodontal pocket, loss of attachment (p-value = 0.026, 0.009) and gender to gingival bleeding (p-value = 0.008) (Table 7).

when comparison of study subjects according to the type of lesion based on deleterious habits, the high percentage was showed among leukoplakia and smoking, and less percentage among oral submucous fibrosis and smoking (58.4% and 0%) respectively and statistically significant difference showed between lesion and smoking (p-value = 0.000). The results revealed that high percentage was showed among oral submucous fibrosis and smokeless form of tobacco, low percentage erythroplakia and smokeless form (54% and 17.1%) respectively and statistically significant difference showed between lesion and smokeless form (p-value = 0.000). In between alcohol and lesion highest percentage in oral lichenplanus and low percentage in erythroplakia (50% and 16.7%) and there is no statistically significant difference showed between lesion and alcohol (p-value = 0.529) (Table 8).

Table 2: Mean score comparison of periodontal status among cases according to variables

Variables		Bleeding		Pocket		Loss of Attachment	
		MEAN ±SD	P -value	MEAN±SD	P- value	MEAN ± SD	P- value
Age group	35-44 years	32 ±0	0.312	5±2.9	**0.026***	2.3±2	0.778
	>45 years	29 ±7		4±1.6		2±1.5	
Gender	Male	30±7.5	0.766	4±2.0	0.394	2±1.6	0.665
	Female	30±6.1		4±1.6		3±1.6	
Smoking form of tobacco	Yes	30±7.4	0.964	4±1.4	0.967	3±1.4	0.43
	no	30±6.7		4±2.1		2±1.6	
Smokeless form of tobacco	Yes	31±4	0.167	4±2.4	0.052	2±1.5	0.259
	no	29.4±8.2		3±1.5		2.3±2	
Alcohol consumption	Yes	32±0.0	0.509	3±1.2	0.53	2±0.8	0.425
	no	30.1±7.1		4.0 ±2		2.5±2	
Type of lesion	Leukoplakia	28±9.4	0.243	3.9±1.9	0.922	2.4±2	0.852
	Erythroplakia	29±8.6		4±1.6		3±1.4	
	OSMF	31±3.6		3.8±2.4		2.2±2	
	OLP	32±0.0		4.2±1.4		2.5±1	

*p<0.05 - Statistically significant

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Saikumar K, et al., Dent Res Oral Health 2024
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Table 3: Mean score comparison of periodontal status among controls according to variables.

Variables		Gingival bleeding		Pocket		LOA	
		Mean ±SD	P value	Mean ±SD	P value	Mean ±SD	P value
Age group	35-44 years	22.8 ±5	0.199	2.7±3.8	**0.022***	1.2±1.9	**0.009***
	>45 years	25.5 ±7		5.1±3.4		2.6±1.7	
Gender	Male	23.6±8	**0.008***	4.3±3.5	0.119	2.2±1.7	0.371
	Female	27.3±4		5.4±3.5		2.6±1.8	
Smoking form of tobacco	Yes	22.3±9.7	0.089	3.9±3.3	0.274	1.7±1.8	0.106
	no	25.7±6.4		4.9±3.6		2.5±1.7	
Smokeless form of tobacco	Yes	25.7±7	0.828	5.7±5	0.435	2.5±2	0.895
	no	25.1±7		4.7±3.4		2.4±1.7	
Alcohol consumption	Yes	26.3±6	0.684	4.8±2.8	0.965	2.9±1.5	0.504
	no	25.1±7.2		4.8±3.6		2.4±1.8	

Table 4: Mean score comparison of periodontal status among cases and controls.

Periodontal status	Cases	Controls	p-value	Total
Gingival bleeding	30.1± 7	25.22 ± 7.1	**0.000***	27.7 ± 7.4
Pocket	3.9 ± 2	4.80 ± 3.5	**0.044***	4.4 ± 3
LOA	2.5 ± 1.5	2.42 ± 1.7	0.737	2.4 ± 1.6

*p<0.05 - Statistically significant

Table 5: Mean score comparison of periodontal status among cases and controls based on age and gender

Periodontal status	Groups	Age groups		Gender	
		35-44 Years	>45 Years	Male	Female
Gingival bleeding	Cases	32 ± 0	29.9±7.3	30±7.5	30.4±6.1
	controls	22.8± 5.8	25.7 ±7.2	23.6±8.3	27.3±4.3
	P Value	**0.000***	**0.00***	**0.000***	**0.009***
Pocket	Cases	5 ± 3	3.8± 1.6	4.1±2.1	3.8±1.6
	controls	2.7 ± 3.8	5.1± 3.5	4.3±3.5	5.4±3.5
	P Value	0.09	**0.002***	0.124	**0.007***
LOA	Cases	2.38± 1.9	2.5±1.5	2.4±1.6	2.6±1.4
	controls	1.2± 1.9	2.6±1.7	2.3±18	2.6±1.8
	P Value	0.145	0.742	0.241	0.948

*p<0.05 - Statistically significant

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Saikumar K, et al., Dent Res Oral Health 2024
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Table 6: Mean score comparison of periodontal status based on deleterious habits

Periodontal status	groups	Smoking		Smokeless tobacco		Alcohol	
		Yes	No	Yes	No	Yes	No
		Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Gingival bleeding	Cases	30± 7.4	30.1±6.6	31±3	29.5±8.2	32±0.0	30±7.1
	controls	22.3± 9	25.7 ±6.4	25.7±7.1	25.1±7.1	26.2±6	25.1±7.2
	P Value	**0.003***	**0.001***	**0.0001***	**0.0039***	**0.039***	**0.000***
Pocket	Cases	4± 1.4	3.8± 2	4.5±2.4	3.8±1.6	3.5±1.2	4±2
	controls	3.7 ± 3.3	4.9± 3.5	5.7±5	4.7±3.5	4.8±2.7	4.8±3.6
	P Value	0.873	0.056	0.293	**0.0028***	0.296	0.067
LOA	Cases	2.7± 1.6	2.5±1.5	2.7±1.6	2.4±1.5	2.0±0.8	2.5±1.6
	controls	1.7± 1.9	2.6±1.7	2.5±2	2.4±1.8	2.9±1.6	2.4±1.8
	P Value	0.08	0.626	0.713	0.873	0.264	0.562

*p<0.05 - Statistically significant

Table 7: Correlation of periodontal status among cases and controls

Variables		Gingival bleeding		Pocket		LOA	
		r value	P value	r value	P value	r value	P value
Cases	Age	-0.102	0.312	-0.222	**0.026***	0.028	0.778
	Gender	0.03	0.766	-0.086	0.394	0.045	0.655
	Smoking	0.005	0.964	-0.003	0.976	0.08	0.43
	Smokeless	0.139	0.167	0.195	0.052	0.114	0.259
	Alcohol	0.067	0.509	-0.064	0.53	-0.081	0.425
	Presence of lesion	0.2	**0.046***	0.02	0.609	-0.03	0.77
Controls	Age	0.129	1.999	0.229	0.009*	0.259	**0.009***
	Gender	0.264	**0.008***	0.157	0.119	0.09	0.371
	Smoking	-0.171	0.089	-0.11	0.274	-0.087	0.387
	Smokeless	0.022	0.828	0.079	0.435	0.013	0.895
	Alcohol	0.041	0.684	0.004	0.965	0.068	0.504

*p<0.05 - Statistically significant

Table 8: Comparison of study subjects according to the type of lesion based on deleterious habits

Type of lesion	Smoking			Smokeless Tobacco			Alcohol		
	Yes	No	P value	Yes	No	P value	Yes	No	P value
	n(%)	n(%)		n(%)	n(%)		n(%)	n(%)	
Leukoplakia	21(58.4%)	14(21.9%)		6(17.1%)	29(45%)		2(33.3%)	33(35.1%)	
Erythroplakia	5(13.9%)	12(18.7%)		4(11.5%)	13(20%)		1(16.7%)	16(17%)	
OSMF	0	24(37.5%)	**0.000***	19(54.3%)	5(7.7%)	**0.000***	0	24(25.5%)	0.529
Oral lichen planus	10(27.7%)	14(21.9%)		6(17.1%)	18(27.7%)		3(50%)	21(22.3%)	
Total	36 (100%)	64 (100%)		35 (100%)	65 (100%)		6 (100%)	94 (100%)	

*p<0.05 - Statistically significant

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Discussion

Oral cancer is utmost health problem in world and exclusively in developing countries like India, many studies showed incidence rates of 13 in male and 8 in female among 100000 population [14].

Oral potentially malignant conditions like oral submucous fibrosis, leukoplakia, erythroplakia, and oral lichen planus are commonly carry an increased risk for malignant transformation in the oral cavity [10]. Literature review revealed that there are very few studies on oral health periodontal status and oral potentially malignant condition. Henceforth, it is unclear to notice that what degree these attributes to oral health and extent to which they can be prevented on early stages.

In current study, a total of 200 participants among them 57 males and 43 females in each cases and control group and majority were above 45 years aged group. This was concordance with a study conducted among rural areas of Indian population by Bhat et al which also has more number of male respondents and above 45 years age-group this might be due to high usage of tobacco and its products in males compares to females [9].

In the current study mean scores of gingival bleeding, periodontal pocket and loss of attachment compared among the pre cancerous lesions and conditions, the gingival bleeding and periodontal pockets showed high in oral lichenplanus (32±0.1) this was similar to study done by Azizi A et al. [15] in Iran population had high mean on comparison with control group (44 ±7) this is due to impaired capacity to maintain oral hygiene and oral hygiene practices hence increased gingival inflammation level and periodontal fibres breakdown and finally leads to periodontal pocket formation.

In our study the gingival bleeding was high in participants who don't smoke, and who consumes smokeless tobacco and alcohol similar to this a study done by Meisal P et al. [7], gingival bleeding was seen more in non smokers compared to smokers this is because vasoconstriction of gingival vessels due to tobacco consumption

Periodontal pockets and loss of attachment was high in participant who consumes smokeless tobacco and alcohol. It's because the tobacco, betel quid and alcohol could lead to activation of specific transcription factors that cause changes in the expression of genes in which leads to enhanced production of inflammatory mediators as probable of creating areas of genetically modified precancerous keratinocytes.

In our study high mean scores of gingival bleeding, periodontal pocket and loss of attachment (30.1±6.7, 3.9±1.9, 2.5±1.5) seen among pre cancerous lesions and condition was in concordance with a study conducted by Rai et al [16] among 30-60 years adult population the study results revealed that Periodontal conditions were found to be worse in the study group as compared to the control group. The mean and standard deviation for Gingival Index (GI), Plaque Index (PI) and Bleeding on Probing (BOP) were calculated and for the study group it was found to be (GI 4.66± 0.76, PI 2.56 ±0.60, BOP 14.3 ±7.34) similarly study conducted by Bhat et al. [3] found strong association between periodontitis and pre-cancerous lesions and condition this is due to many factors such has deleterious habits, socio economic status, systemic disorders, stress, environment and lifestyle.

The results revealed that gingival bleeding and periodontal pockets was high in cases than controls of both age groups (35-44, >44 years) and gender this was similar to the study done by Rathod S et al. [17] in Nagpur city, gingival bleeding was more in cases than control group this is due to gingival blood flow impaired and this suppress the normal gingival inflammatory response and leads to gingival inflammation.

The study results revealed, that gingival bleeding was high in cases than controls of smoking, smokeless tobacco and alcohol consumption and Periodontal pockets are more in smoking among the cases than control. In smokeless tobacco and alcohol consumption controls had more periodontal pockets than cases similar to this study conducted by Hari Vinay B et al. [14] among Andhra Pradesh and Telangana region revealed that both chewing and smoking habits has a predominant role in the occurrence of pre-cancerous lesion and conditions. Loss of attachment was high in smoking, smokeless tobacco and low in alcohol consumption among the cases than controls. A study by Bhat et al. [9] suggests that rigorous screening and diagnosis for pre cancerous lesion and condition should be followed in patients/participants with chronic periodontitis and habits of tobacco, alcohol and betel-quid use.

Our findings shows there was positive correlation between age, gender, deleterious habits, pre cancerous lesion, precancerous condition and periodontal status this was similar to study by Bhat et al. [9] periodontitis and tobacco-chewing were independently associated with pre cancerous lesion, precancerous condition. Similarly a systematic review study done by Colonia-Garcia et al. [18] identified some studies had suggested a positive relationship between periodontal disease and Oral cancer (OC) and Oral Potential Malignant Disorder (OPMD). Clinical and radiographic parameters such as Clinical Attachment Loss (CAL), PI, and BOP were increased in patients with OC and OPMD.

The present study showed comparison of study subjects according to type of lesion based on deleterious habits, the high percentage was showed among leukoplakia and smoking, and less percentage among oral submucous fibrosis and smoking this is due to areca nut and smokeless tobacco was many etiological and causative factor for oral submucous fibrosis [19,20] and less habit of smoking, smoking was potentially risk factor for leukoplakia, oral lichen planus [21].

The study acknowledges certain limitations as it is a

Saikumar K, et al., Dent Res Oral Health 2024
DOI:10.26502/droh.0079

single institution based study and with low sample size generalization of the results should be made with caution. Since pre cancerous lesions and conditions are correlated with some unobserved variables like occupation and socioeconomic status they might have attributable affects on oral health and further recommend studies to investigate with more sample size and with more parameters.

Conclusion

The current study concludes that overall periodontal status was worse in precancerous lesions leukoplakia, erythroplakia and precancerous condition oral submucous fibrosis, oral lichenplanus than control group and tobacco and alcohol consumption was significant risk factor for development of precancerous lesion and condition.

Oral precancerous lesion and condition showed significant positive correlation with gingival bleeding. Whereas. Negative correlation was observed between precancerous lesion and condition to periodontal pocket and loss of attachment.

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Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

Katukuri Saikumar: Conceptualization, Methodology, Data curation, Writing- Review and editing

Aishwarya Lakshmi Billa: Conceptualization, Methodology, Project administration.

Shravya Deverashetty: Software Supervision, Writing- Original Draft preparation, and editing.

Sumalatha: Software, Validation, corrections, resources, and internal visualization.

Sharika yadav: Validation, corrections, resources

Akshith Basetty: Visualization, Investigation

Ethics approval and consent to participate

Ethical endorsement was obtained from the institutional review board of xxxxxxxx xxxxxx Institute of Dental Sciences and Research Centre, Hyderabad, Telangana, India) (IEC No: PMVIDS&RC/IEC/PHD/PR/0329-19) and was performed in accordance with the Declaration of Helsinki. In addition to aspects of personal information protection, participants were informed ofthe outline of the study, voluntary enrollment and withdrawal policies (participants were free to withdraw from participation without discrimination). They were also informed that the results would be made public at scientific conferences and in the literature prior to the start of the study.

Patient consent for publication

Not applicable.

Declaration of interests

"The authors declare no competing interests."

References

1. Şenel S. An Overview of Physical, Microbiological and Immune Barriers of Oral Mucosa. Int J Mol Sci 22 (2021): 7821.
2. Chandroth SV, Venugopal HK, Puthenveetil S, et al. Prevalence of oral mucosal lesions among fishermen of Kutch coast, Gujarat, India. Int Marit Health 65 (2014): 192-198.
3. Arjun TN, Sudhir H, Sahu RN, et al. Assessment of oral mucosal lesions among psychiatric inmates residing in central jail, Bhopal, Madhya Pradesh, India: A cross-sectional survey. Indian J Psychiatry 56 (2014): 265-270.
4. Mansour GF, Joukar F, Rabiei M, et al. Prevalence of oral mucosal lesions in an adult Iranian population. Iran Red Crescent Med J 15 (2013): 600-604.
5. Torwane NA, Hongal S, Goel P, et al. Assessment of oral mucosal lesions among eunuchs residing in Bhopal city, Madhya Pradesh, India: A cross-sectional study. Indian J Public Health 59 (2015): 24-29.
6. Ptasiewicz M, Grywalska E, Mertowska P, et al. Armed to the Teeth-The Oral Mucosa Immunity System and Microbiota. Int J Mol Sci 23 (2022): 882
7. Meisel P, Holtfreter B, Biffar R, et al. Association of periodontitis with the risk of oral leukoplakia. Oral Oncology 48: (2012): 859-863.
8. Raj JBS, Gokulraj S, Sulochana K, et al. A cross-sectional study on oral health status of battery factory workers in Chennai city. J Int Soc Prev Community Dent 6 (2016): 149-153.
9. Bhat M, Bhat S, Roberts-Thomson K, et al. Is Periodontitis Independently Associated with Potentially Malignant Disorders of the Oral Cavity? Asian Pac J Cancer Prev 20 (2020): 283-287.
10. Tezal M, Sullivan MA, Reid ME, et al. Chronic periodontitis and the risk of tongue cancer. Arch Otolaryngol Head Neck Surg 133 (2007): 450-454.
11. Könönen E, Gursoy M, Gursoy UK. Periodontitis: A

Saikumar K, et al., Dent Res Oral Health 2024
DOI:10.26502/droh.0079

Multifaceted Disease of Tooth-Supporting Tissues. J Clin Med 8 (2019): 1135-1141.

12. Naga SD, Gundamaraju KK, Bujunuru SR, et al. Prevalence of oral potentially malignant and malignant lesions at a tertiary level hospital in Hyderabad, India. J NTR Univ Health Sci 3 (2014): S13-S16.
13. World Health Organization. Oral Health Surveys, Basic Methods. 5th ed. Geneva (2013).
14. Hari Vinay B, Venkat Baghirath P, Vijay Kumar J, et al. Prevalence of precancerous lesions and conditions in Telangana region, Andhra Pradesh, India. J Indian Assoc Public Health Dent 12 (2014): 23-27.
15. Azizi A, Rezaee M. Comparison of Periodontal Status in Gingival Oral Lichen Planus Patients and Healthy Subjects. Dermatol Res Pract. 20 (2012): 561232.
16. Rai NP, Kumar P, Mustafa SM, et al. Relation Between Periodontal Status and Pre-Cancerous Condition (Oral Lichen Planus): A Pilot Study. Adv Clin Exp Med 25 (2016): 763-766.
17. Rathod S, Wanikar I, Raj A, et al. Association between kharra chewing and periodontal health status in oral submucous fibrosis patients of Central India, Nagpur. J Indian Soc Periodontol 22 (2018): 345-347.
18. Colonia-García A, Gutiérrez-Vélez M, Duque-Duque A, et al. Possible association of periodontal disease with oral cancer and oral potentially malignant disorders: A systematic review. Acta Odontol Scand 78 (2020): 553-559.
19. Xu C, Zhao J, Li Q, et al. Periodontal status in patients with oral submucous fibrosis 34 (2009): 914-918.
20. Dodani K, Anumala N, Avula H, et al. Periodontal findings in patients with oral submucous fibrosis and comet assay of affected gingival epithelial cells. J Periodontol 83 (2012): 1038-1047.
21. Jornet PL. Periodontal conditions in patients with oral lichen planus: A pilot study. Quintessence Int 43 (1985): 147-152.