Original Article

Gingivitis and Associated Factors among Patients visiting Secondary Care Hospitals of (Gadap Region) Karachi, Pakistan

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ABSTRACT

Objective: Gingivitis is a commonly occurring preventable disease prevalent among the people of Pakistan. Gingivitis is a disease of the gums which if left untreated can turn into a more extreme disease known as periodontitis. The objectives of the study were to assess the frequency of gingivitis in patients visiting secondary care hospital in Gadap region in Karachi, Pakistan and to study the level of gingivitis and its associated risk factors in these patients.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the patients attending out-patient department of private secondary care dental hospital in Gadap town, Karachi, Pakistan from January till June 2018.

Materials and Methods: Multistage sampling technique was used; initially stratified sampling was done for making strata of male and female which was followed by non-probability purposive sampling for selection of the participants.

Results: A total of 387 patients were examined of which 208 (53.7 %) were males and 179 (46.3%) were females. The age group ranged from 30 to 39 were seems to be the highest among all other ranges with total of 131 patients out of 387 and second highest age group was form 40 to 49 with total of 127 patients respectably. A highly significant association (p value < 0.001) between gingivitis and gender of the patients was found. A significant association (p value < 0.05) was found between the degree of gingivitis and tobacco chewing or tobacco containing products. A highly significant association (p value < 0.001) between gingivitis and the bleeding gums during brushing was observed. Majority of the patients (n=139, 84.2) with bleeding gums during brushing had severe inflammation as well.

Conclusion: It is indicated from the study that the poor oral hygiene and improper eating habit have a negative impact on the periodontal condition and that can leads to severe destructive condition of oral tissue.

Key Words: Gingivitis, Periodontitis, Inflammation, Oral Hygiene, Oral Health.

INTRODUCTION

Gingivitis is the commonest oral disease in Pakistan[1]. Gingivitis is a disease of the gums which if left untreated can turn into a more extreme disease known as periodontitis.

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Gingival diseases are non-destructive infection that includes a diverse family of pathological entities caused by various etiological factors[2]. However, if gingivitis is left unchecked and untreated, gingivitis can bring about the gums to separate from the teeth. This can cause harm to the tissue and bone supporting the teeth. If the contamination worsens, one may lose tooth or need to get it uprooted by a dental practitioner[3].Several different factors contribute towards Gingivitis which includessmoking, diabetes, medicines, dental appliances, over hanging filling, HIV and others.[4] Gingivitis is preventable and reversible disease of periodontal tissue. This requires proper brushing technique, twice daily, regular visits to the dentist, use of mouth washes and proper rinsing of mouth after every meal[5].

In Pakistan, numerous researchers have demonstrated that periodontal problem never occurs alone; it is associated with other risk factors that cause periodontal disease.The objectives of the study were to assess the frequencyof gingivitis in patients visiting secondary

care hospital in Gadap region in Karachi, Pakistan and to study the level of gingivitis and its associated risk factors in these patients.

MATERIALS AND METHODS

A cross sectional study was conducted to assess the level of gingivitis among the patients attending out-patient department of private secondary care dental hospital in Gadap town, Karachi, Pakistan. The duration of the study was six months from January till June 2018. Multistage sampling technique was used; initially stratified sampling was done for making strata of male and female which was followed by non-probability purposive sampling for selection of the participants. Considering Confidence Level of 95% and precision of 5% with an expected proportion of 50%, the sample size according to the Daniel formula for sample size calculation was 384 patients. Therefore, a total of 384 patients were interviewed to assess the status of gingivitis. Patients aged between 20 to 50 yearswith presence of all teeth excluding the third molar were included. Patients who had any known systemic diseases, were handicapped or were illiterate were excluded from the study.

The closed ended questionnaire was adapted from different articles which consists of two parts, part one included the questions regarding the demographic characteristics of the subjects and second part included the information on risk factors associated with gingivitis and factors effecting gingival tissue.

List of articles from where the questionnaire has been extracted.

Question 5-10	Almas K, Al Shwaimi E, H As, N S. The oral hygiene habits among intermediate and secondary schools students in Riyadh, Saudi Arabia. Pak Oral Dent J. 2003;23(1):29-34[5].
Question 11-15	Nessa J, Choudhury S. Gingivitis: A Common Preventable Oral Health Problem. TAJ: Journal of Teachers Association. 2004;17(1):20-6.[2]
Question 16-20	Jamjoum H. Preventive oral health knowledge, practice and behaviour in Jeddah, Saudi Arabia. Tropical Dental Journal 1997:13 – 8[6].

A pilot study on 10% of the sample size was done and Crohn Bach Alpha was applied to assess the validity and reliability of the questionnaire in our cultural setting. Gingival tissue was examined according to the gingival index proposed byLoe and Silness[7].

0	Normal gingival	
1	Mild inflammation	Slight color change, slight edema, No bleeding on probing.
2	Moderate inflammation	Redness, edema and glazing. Bleeding on probing
3	Severe inflammation	Marked redness and edema. Ulceration, Tendency of spontaneous bleeding

IBM SPSS version 17 was used to analyze the data. Frequency tables were generated for easy visualization of the data and frequency distribution and percentage was used for categorical data like sex and groups of age. Chi Squaretest was used to measure associations between the variables. The significant p-value for the study is < 0.05.

Participation of all the subjectswas voluntary. Verbal information was provided to the all participants about the purpose, risk and benefits of the study. Written informed consent was obtained from all the participants. All participants had the right to quit the study at any point of time. All of the information provided by participants' was kept confidential and anonymous**.**

RESULTS

Table I: Demographic Variables of the studied subjects (N=387)

		Frequency(n)	%age
Gender			
	Male	208	53.7
	Female	179	46.3
Age Groups			
	20 - 29	110	28.4
	30 - 39	131	33.9
	40 - 49	127	32.8
	50	19	4.9
Educational Status			
	Secondary / Middle	131	33.9
	Matriculation	138	35.7
	Intermediate	82	21.2
	Graduate	35	9.0
	Postgraduate	1	.3
Tobacco Smoking			
	Yes	229	
	No	158	
Gingival Index			
	Mild Inflammation	30	7.8
	Moderate Inflammation	192	49.6
	Severe Inflammation	165	42.6

A total of 387 patients were examined of which 208 (53.7 %) were males and 179 (46.3%) were females. The age group ranged from 30 to 39 were seems to be the highest among all other ranges with total of 131 patients out of 387 and second highest age group was form 40 to 49 with total of 127 patients respectably.

Most of the subjects had done matriculation (35.7%) followed by secondary school (33.9%). According to the results it has been shown that the different patient showed different type of gingivitis. Total of 387 patients were examine of which 30 (7.8 %) patients were having mild inflammation. Majority of the patients were having moderate sign of gingivitis (n=192, 49.6%) and 165 patients (42.6%) had severe inflammation.

Table No.2: Risk factors associated with gingivitis and factors effecting gingival tissue

		Freq-uency (n)	%age
Do you have any systemic problem?	Yes	149	38.5
	No	238	61.5
Do you take any form of tobacco or tobacco containing products?	Yes	232	59.9
	No	155	40.1
How many times a day you clean (brush/ maswak) your teeth?	Once	312	80.6
	Twice	71	18.3
	Thrice	4	1.1
What instrument you use for cleaning teeth?	Neem	14	3.6
	Datum	5	1.3
	Maswak	38	9.8
	Toothpaste	330	85.3
Brushing Technique	Circular	46	11.9
	Horizontal	312	80.6
	Scrubbing	18	4.6
	Vertical	11	2.9
Do you use inter-dental cleaning devices?	Yes	83	21.4
	No	304	78.6
Does your gum bleed while brushing?	Yes	288	74.4
	No	99	25.6
Have you ever visited a dentist?	Yes	110	28.4
	No	277	71.6
Do you have pain in your gums?	Yes	240	62.0
	No	147	38.0
Do you have chewing problems while eating due to pain in the gums?	Yes	261	67.4
	No	126	32.6
Do you have a problem of bad breath?	Yes	244	63.1
	No	143	36.9

Table 2 shows that majority of the patients (n=238, 61.5%) did not have any systemic problem along with their gingivitis. Majority of the patients (n=232, 59.9%) used tobacco or tobacco containing products. Majority of patients (n=312, 80.6%) patients brushed only once a day as compared to 18.3% who brushed twice a day every day. Most of the patients (n=330, 85.3%) used tooth paste for brushing as compared to 38 (9.8%) who used maswak as the cleaning substance of their teeth. The majority of the patients (n=312, 80.6%) used horizontal brushing technique and most of them (n=304, 78.6%) did not use any kind of interdental cleaning devices. Majority of the patients (n=288, 74.4%) reported that their gums bleed while brushing yet majority of them (n=277, 71.6%) never visited any dentist for their dental complains. Most of the patients (n=240, 62.0%) had pain in their gums and therefore most of them (n=261, 67.4%) also had chewing problems while eating due to this pain. Pain in gums during gingivitis is an important sign, which divide the gingivitis into its different type, by its nature. If patient is suffering from gingivitis and having plaque and calculus deposition then patient might suffer from chewing problems while eating. Majority of the patients (n=244, 63.1%) has a problem of bad breath as well which shows the poor status of their oral hygiene and lack of awareness among the patient on maintenance of oral health**.**

A highly significant association (p value < 0.001) between gingivitis and gender of the patients was found. Majority of the males (n=121, 73.3%) had more severe inflammation whereas majority of the females (n=121, 63.0%) showed a moderate from of inflammation.

A significant association (p value < 0.05) was found between the degree of gingivitis and tobacco chewing or tobacco containing products. It has been found that the patients taking tobacco in any form are highly affected by the gingivitis as compared to the patients not using tobacco in any form which also highlights that use of tobacco can cause many diseases like OSF (oral sub mucosal fibrosis) and oral cancer.

Ahighly significant association (p value < 0.001) between gingivitis and the bleeding gums during brushing was observed. Majority of the patients (n=139, 84.2) with bleeding gums during brushing had severe inflammation as well.

A significant association (p value < 0.001) between gingivitis and pain in gums was found. Majority of the cases (n=144, 87.3%) who had pain in their gums had severe inflammation of the gums as well.

Table No.3: Association between Gingival Index and other variables

		Gingival Index						p value
		Mild Inflammation		Moderate Inflammation		Severe Inflammation		
		n	%	n	%	n	%	
Gender	Male	16	53.3	71	37.0	121	73.3	0.000
	Female	14	46.7	121	63.0	44	26.7	
	Total	30	100	192	100	165	100	
Use of Tobacco or containing products	Yes	13	48.1	103	53.6	113	67.3	0.008
	No	14	51.9	89	46.4	55	32.7	
	Total	27	100	192	100	168	100	
Bleeding Gums	Yes	27	100	122	62.6	139	84.2	0.000
	No	0	0	73	37.4	26	15.8	
	Total	27	100	195	100	165	100	
Pain in Gums	Yes	27	90.0	66	34.4	144	87.3	0.000
	No	3	10.0	126	65.6	21	12.7	
	Total	30	100	192	100	165	100	

P value <0.05 = significant, <0.01 = very significant, <0.001 = highly significant

DISCUSSION

Gingivitis is a preventable commonly occurring disease in Pakistan that can be caused by several different risk factors like smoking, diabetes, medicines, dental appliances, over hanging filling, HIV, improper brushing andothers[8]. Among the different associated risk factors that causes the gingivitis, tobacco smoking or chewing tobacco was the most frequent one reported. The tobacco chewing was reportedly equally common in both the genders.[6]

It has been shown that certain pathological changes do take place during the fixed orthodontic treatment with the application of the orthodontic appliances in the mouth of the patient. These changes are observed during the first few months of the start of the treatment. These orthodontic appliances providean area around the tooth where the bacterial plaque can accumulate on the tooth surface that can lead to the gingival inflammation[9,10]. In the present study, few patients especially females reported with orthodontic appliances in their mouth and they were found to have poor oral hygiene with plaque accumulation and bad breath from their mouth. Thus, the orthodontic appliances during the treatment can be considered as a risk factor for periodontal inflammation and can cause gingivitis[11].

Gingivitis causes difficulty in chewing; recession, irritation of the gums and bad breath that does not go away even after brushing the teeth. However, gingivitis itself can be prevented and is reversible by using the proper brushing technique; twice daily with regular visits to the dentist, use of mouth washes and proper rinsing of mouth after every meal[5]. The present study shows that majority of patients were brushing only once every day and their technique was also questionable hence the high rate of gingivitis among the patients.

There have been studies showing the effectiveness of Azadirachita indica (Neem) leaf extract and twig extract in comparison with Chlorhexidine Gluconate to function as an anti-microbial agent and reduces the count of microorganisms in oral cavity and thus prevents the bacterial growth inside the oral cavity. These agents are available in different products like mouth washes, tooth paste and others.[12-15] The present study endorses this finding that the patients using mouth washes, tooth pastes had better oral hygiene as compared to others because these products reduced the count of bacterial oral flora and thus prevented from gingival inflammation.

Another study showed the results on the use of herbal products and identified herbal dentifrices as a risk factor of the gingival inflammation that can cause gingivitis instead of preventing it. The study further elaborates that the use of herbal products is good but it doesn't remove all the food debris that accumulates around the tooth, especially inter-dental areas[16]. This accumulation of food debris can cause caries in inter-dental areas because of the increase bacterial growth in that area. The present study supports the idea as inter-dental cleaning was not observed in majority of the patients included in the study and these patients also had some form of gingivitis.

CONCLUSION

It is indicated from the study that the poor oral hygiene and improper eating habit have a negative impact on the periodontal condition that can lead to severe destructive condition of oral tissue**.**

Author's Contribution:

Concept & Design of Study:	Malik Muhammad Saqib
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Revisiting Critically:	Malik Muhammad Saqib, Atif Mahmood
Final Approval of version:	Malik Muhammad Saqib

Conflict of Interest: The study has no conflict of interest to declare by any author.

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