Prevalence of Periodontal Diseases (Gingivitis, Periodontitis) among the Adult's Patient Visiting to Dental Section of District Headquarter (DHQ) Hospital, Landikotal, Khyber Pakhtunkhwa, Pakistan

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Abstract

Introduction: Periodontal disease, a chronic inflammatory condition affecting the periodontium, progresses to an advanced stage marked by the loss of periodontal ligament and destruction of nearby alveolar bone. The two most common periodontal diseases are gingivitis and periodontitis. Gingivitis is a mild form of periodontal disease and is characterized as the presence of gingival bleeding at least at one site. While a condition that affects teeth and the tissues that support them is called periodontitis.

Objective: The aim of this study was to evaluate the prevalence of periodontal disease (gingivitis and periodontitis) among individuals above 15 years of age.

Materials and methods: The observational cross-sectional study was conducted in DHQ, Hospital of District Khyber from June to November 20. A total of 384 patients (150 males and 234 females) of above 15 years of age were randomly selected as study participants. Based on the clinical examination data and filled questionnaire the study subjects were categorized either into gingivitis or periodontitis.

Results: Frequency distribution and percentage were calculated. Among 384 patients, 169 (44%) had gingivitis and 147 (38.2%) had periodontitis and 68 (17.7%) had no disease. In gender wise comparison, among 234 females, 113 (48.3%) had gingivitis and 74 (31.6%) had periodontitis. Among 150 males, 56 (37.3%) had gingivitis and 71 (47.3%) had periodontitis. Also, association with age was assessed, gingivitis was more in age group of 15-25 years 63 (65.6%) and decreased as age increased while periodontitis was more in age group 46 to 55 years 30 (76.9%) and increased as the age increased.

Conclusion: In the given population, a greater proportion of individuals were affected by gingivitis, with a prevalence rate of 44%, as opposed to periodontitis, which had a prevalence rate of 38.3%. Moreover, the occurrence of gingivitis was more common among females, while periodontitis was more prevalent among males.

Keywords: Dental plaque, gingivitis, periodontitis, periodontal disease

Introduction

A periodontal disease can be described as any disorder affecting the tissues surrounding and supporting the teeth, collectively known as the periodontium. These disorders can have various origins, including developmental, inflammatory, traumatic, neoplastic, genetic, or metabolic causes.[1,2]

Gingivitis, the mildest form of periodontal disease, is quite common and can be easily reversed through proper oral hygiene practices. It affects a significant percentage (50 to 90%) of adults globally, with the exact prevalence varying depending on how it's defined.[3] Inflammation that goes deeper into the tissues, leading to the loss of connective tissue and bone support, is termed periodontitis. Periodontitis can lead to the development of pockets or crevices between the gum tissue and tooth roots and in severe cases, tooth loss could occur.[4] Etiology of these diseases is linked with Genetics, Tobacco and alcohol use, HIV and AIDS, Nutrition, Osteoporosis, Diabetes. Risk factors incrimated are Smoking, Bad oral hygiene, Hormonal changes in females, Diabetes, Medication, Stress. Non-modifiable Risk Factors are age (more pronounced among individuals aged 60-69 years) and genetic factors.[5-9]

Chronic gingivitis often leads to minor bleeding from the gums while brushing teeth, which is typically not a significant issue unless there are underlying blood disorders or bleeding conditions. On the other hand, chronic periodontitis is usually

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symptomless until it reaches a severe stage where teeth start shifting, becoming loose, or even being lost. Individuals with advanced periodontitis may also experience recurrent periodontal abscesses (pus-filled pockets) and bad breath.[5]

The clinical diagnosis of chronic periodontal disease relies on visual and radiographic assessments (see Figure 2) of the periodontal tissues, as well as measurements of the gap between the tooth and the gum.[10] Normally, these gaps are 1–3 mm deep but become deeper as the supporting connective tissue and bone are lost.

Dental X-rays are routinely used to evaluate the amount of bone support for the teeth and identify any other pathological conditions. Digital subtraction radiography, when compared to traditional radiography, can improve the detection of periodontal bone loss over time but is limited by the need for standardized geometric images.[11]

The World Health Organization (WHO advises the implementation of integrated public health preventive tactics, grounded in a common risk factor approach. Factors like smoking, stress, and a lower socioeconomic status are linked to not only periodontal disease but also other chronic systemic diseases. Consequently, incorporating strategies for preventing oral diseases within initiatives aimed at preventing chronic systemic diseases can effectively reduce the overall disease burden within the population.[12]

The chosen treatment approach depends on the disease stage. Several methods are used to treat the disease, including surgery, mechanical therapy, and the use of pharmaceutical agents. Medications, specifically tailored for improved periodontitis management, encompass antimicrobials that alter the microbial environment in the periodontal area and host response-modifying agents that regulate excessive enzyme levels, cytokines, prostaglandins, and osteoclast activity.[13,14]

Although both international and national studies have been conducted regarding the topic, but the study lacks the rural area figures of Pakistan that clarify the need to assess the oral health of their population. Pakistani studies have demonstrated limited literature on studies of periodontal health status of Khyber District. It is crucial for patients to have adequate knowledge about their oral health status and certain research studies need to be worked on it.

Materials and Methods

A cross-sectional study was conducted in District Headquarters (DHQ) of Khyber district, KPK. The data was collected after taking institutional review board approval and ethical committee from hospital with a sample size of 384, using the open epi, software. The study included all the diagnosed patients who volunteered and agreed to take part in the data collection. The observational cross-sectional study was conducted in District Headquarter Hospital Landikotal, Khyber Pakhtunkhwa Pakistan. The non-probability convenience sampling technique was used in the study. The sample size of this study was 384 subjects. This research project was completed over a period of six months. All Patients visiting to dental section at District Headquarter Hospital, both male and female patient were included. Uncooperative patients and Patients below the 15 years were excluded from the study.

After obtaining the ethical approval from institutional committee, the informed consent was taken from the patients/guardian who willingly included in the study and data was collected through questionnaires.

Statistical analysis of data was conducted by SPSS Version-27. Continuous variables were presented by mean and standard deviation. Categorical variables were expressed by percentages and frequency table to estimate the differences between groups.

Result

Table 1: Demographics

S No	Variable	Categories	Frequency	Percentages
1	Age Group	15-25 years	96	25.0%
		26-35 years	182	34.4
		36-45 years	81	21.1
		46-55 years	39	10.2
		56 years and above	36	9.4
2	Gender	Male	150	39.1
		Female	234	60.9
3	Occupation	Employed	95	24.7
		Unemployed	289	76.3
4	Marital status	Married	329	85.7
		Unmarried	55	14.3
5	Education level	Illiterate/ uneducated	192	50.0
		Primary level	141	36.7
		Secondary level	24	6.3
		Graduate	18	4.7
		Postgraduate	9	2.3
6	Comorbidities	Yes	84	21.9
		No	300	78.1

Table 2 presents the maximum age group 26-35 years, followed by 15-25 and so on. Here the detailed analysis of population demographics, District Khyber shows the distribution of females 60.9%, greater than males that is 39.1% of the total sample.

Furthermore, the noticeable figures were the educational level of this rural district that the rate of illiteracy is 50%, followed by the primary level education that is 36.7%.

The associated systemic factors and co-morbidities do not exist in 78.1% of the selected population.

Table3: Clinical Examination of participants

S No.	Clinical Examinations	Variable	Frequency	Percentages
1	Gingival Color	Coral Pink	164	42.7%
		Red	220	57.3
2	Bleeding with probe	Yes	216	56.3
		No	168	43.8
3	Dental Plaque	Yes	345	89.8
		No	39	10.2
4	Dental Calculus	Yes	257	66.9
		No	127	33.1
5	Gum Recession	Yes	224	58.3
		No	160	41.7
6	Tooth Mobility	Yes	26	6.8
		No	358	93.2
7	Probing Depth	Normal<3	227	59.1
		Abnormal >3	157	40.9

Table4: Gingivitis and periodontitis

Disease	Frequency	Percentage
Gingivitis	169	44.00%
Periodontitis	147	38.20%
No disease	68	17.70%
Total	**384**	**100%**

A detailed analysis of gingivitis disease that exists in 44 % of population with frequency 169 and periodontitis is found in 38.2 % of population with frequency of 147. Hence the table also shows the 17.7 % of population with no disease condition.

The age group shows the 15-25 years has 65.6% gingivitis, followed by 26-35-year grow

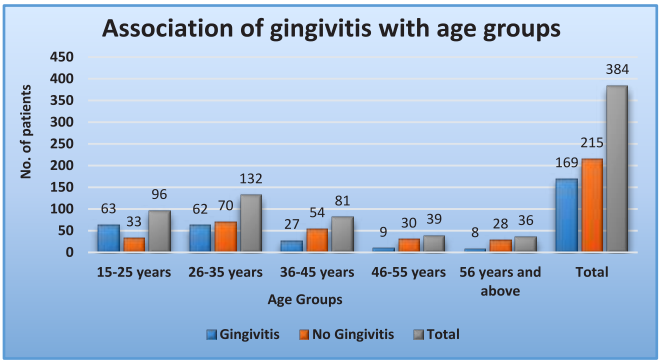

Figure2: Association of gingivitis with age groups

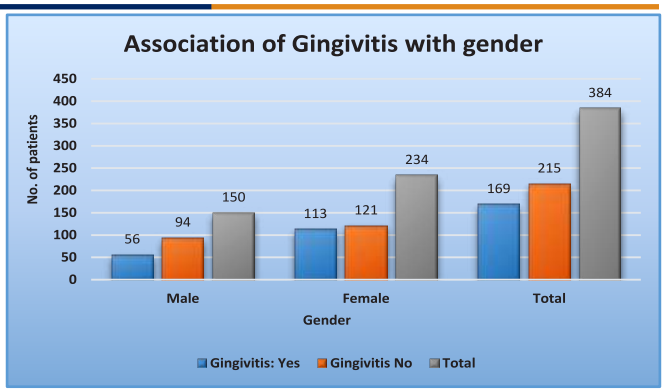

Figure3: Association of Gingivitis with gender

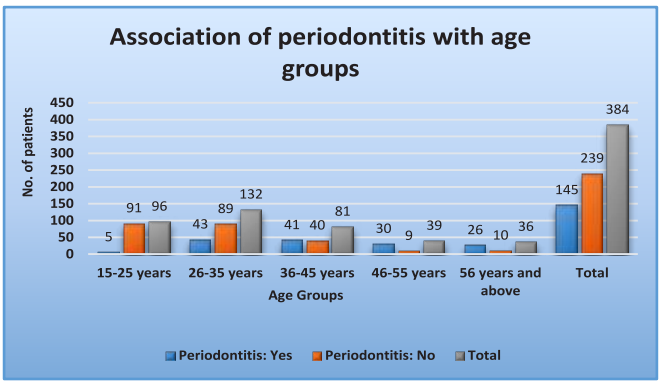

Figure4: Association of periodontitis with age groups

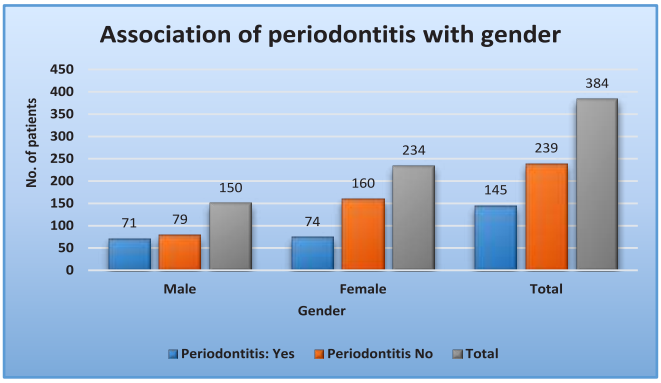

Figure5: Association of periodontitis with gender

Discussion

Oral health practices are the key to maintaining oral hygiene. The observational study aimed to explores the prevalence of periodontal diseases i.e. gingivitis and periodontitis for the general population of District Headquarter Hospital Landikotal visited by a self-perceived periodontal disease or on referral by a dentist. However, despite the raising awareness in urban countries, the need to evaluate disease status in rural areas is highlighted.

A non-probability consecutive sampling technique was used to recruit 384 participants. The study findings and comparisons are collected from this study were clinically examined and questionnaire were filled, are presented in tables. The highest age group in our study was 26-35, followed by 15-25 and so on. While other studies reported the same age group for gingivitis whereas periodontal disease was progressing by increasing the age group.

A local comparative study in (2020) Sofia Shehzad on periodontal disease among the gender in Sardar Begum Dental College - Gandhara University Peshawar, KPK reveals that the prevalence of gingivitis was more (76.5%) among the population than the periodontitis. Whereas our study reveals 44% gingivitis. The gap differences were due to the sample size taken being from all diseased patients whereas our sample was taken from the general population. The gingivitis in females was higher due to low educational status of people in Landikotal.[15]

One of the International a cross-sectional study conducted by Aimetti M. from Italy, to determine prevalence among age grouped of 20-75. Their study findings revealed the estimated prevalence rates of severe and moderate periodontitis were 34.94% and 40.78%, respectively. While the periodontitis was in high percentages in age group of 46-55 years (76.9%) and in low percentages in age group 15-25 years (5.2%) in our study and the prevalence of periodontitis was increasing as the age increases.[16]

Another survey was conducted in China (2015-2016) by Jia J. assessed the periodontal disease status and its severity among the oral health survey highlighted the occurrence of periodontitis 64.6% in an older population followed by 52.8% in adult group. Their study mentioned the increase of severity based on older age group, with an individual that are smokers displayed more severe cases of disease. While the periodontitis in present study is 37.3% and increases as the age increases i.e. in older 46-55 years (76.9%) periodontitis whereas in adults 36-45 years (50.6%) Our study showed the figures of rural areas I-e district Khyber which is why the differences highlights the less focus on oral health practices in District Khyber.[17]

In the present study, there was a significant association between age, gender and disease status. The participants above the 40 ages have more cases of periodontitis in comparison to other regional means of study which highlights poor oral hygiene in their oral habits. Citation of smoker. Gum recession has been found in 58.3% of population whereas increase tooth mobility was found in 6.8% of population and abnormal probing depth has been highlighted in 40.9% of individual, contributing to periodontal heath has been different from other studies conducted in Pakistan. Due to lack of data in the epidemiological server.[18]

Higher prevalence rates are attributed to poor oral hygiene, lack of government financing for oral health services in rural areas and lack of oral health promotion programs and policies aimed at the population of our region. The burden of periodontal disease has been increasing from the last decades, and large evidence highlights that it is significantly and strongly association with lack of awareness.[19-21] Due to lack of periodontal data in this case epidemiological data should be strong for the preventing of periodontal disease which is needed for the allocation and health resources for the treatment plan and follow-up of the disease.

Conclusion and Recommendation

Periodontal disease, one of the most common inflammatory conditions globally, has often been referred to as a "silent disease," leading to insufficient awareness regarding its prevalence and its effects on oral health Over the last two decades, a growing body of research has highlighted the significance of in-depth investigations within the field of periodontal medicine.

This study aimed to investigate the prevalence of two periodontal diseases (gingivitis and periodontitis) in rural area Landikotal, District Khyber, Khyber Pakhtunkhwa Pakistan. Gingivitis is the mild form of periodontal disease characterized by bleeding with probe and red color of gingiva while periodontitis is advanced stage of the periodontal disease characterized by tooth mobility, gum recession, probing depth.

Within the limitations of this study, it was found that in the studied population of individuals aged 15 years and above, gingivitis was more prevalent (44%) than periodontitis (38.2%). Furthermore, the research revealed that gingivitis was more common among females, while periodontitis had a higher occurrence among males. Additionally, the study observed that as individuals' age increased, the prevalence of gingivitis decreased, whereas the prevalence of periodontitis increased

Limitation of the present study include a small sample size and the use of only clinical parameters for disease categorization. Therefore, further research is needed to validate the results of this study. This can be achieved by incorporating various clinical, oral radiographic, microbiological, and immunological assays to diagnose and classify the status of periodontal disease.

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Author Contributions

1. Muhammad Muqarab - Conceptualization and Data Collection
2. Tanzeel Saleem Gandapur - Literature review and Methodology of study
3. Abu ul Ala - Manuscript review
4. Saqiba Yaseen - Manuscript writing
5. Bushra Akbar - data interpretation and Data Analysis