Article

Prevalence of Periodontitis Among The Population: Findings From a Clinical Study

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Abstract: Periodontitis is a chronic inflammatory disease affecting the supporting structures of the teeth, including the gingiva, periodontal ligament, and alveolar bone. The prevalence of this disease varies across different populations due to genetic, biological, and environmental factors. In Fergana, Uzbekistan, studying the distribution of periodontitis among various age groups and genders is crucial to understanding its epidemiology and risk factors. Periodontitis is not only a localized oral disease but also contributes to systemic conditions such as cardiovascular diseases, osteomyelitis, and sinusitis. The primary etiological agent, Porphyromonas gingivalis, plays a key role in the progression of periodontal destruction. Despite advancements in clinical treatments, early diagnosis and preventive strategies remain inadequate. The global burden of severe periodontitis ranks 11th among prevalent diseases, affecting 20–50% of the population. Addressing this issue requires innovative therapeutic approaches, including regenerative strategies using odontogenic stem cells and periodontal tissue engineering. Therefore, developing global therapeutic strategies is essential for periodontal tissue regeneration and effective disease management.

Keywords: Periodontitis, Porphyromonas Gingivalis, Periodontal Inflammation, Chronic Disease, Systemic Conditions, Periodontal Therapy, Regenerative Medicine, Epidemiology, Periodontal Tissue Engineering

1. Introduction

In modern times, identifying disease symptoms and signs among humans has become more precise. Each pathology is approached with specific methods, and distinguishing features for differential diagnosis are identified and classified. Particularly in medicine, these advancements, along with the improvement of new diagnostic methods, enable the early detection of diseases and their timely identification based on symptoms.

However, the global scale of this progress is not evenly distributed across the world. The reason lies in each country's geographic location, the racial composition of its population, and, more specifically, its biological diversity. The genetic, biological, and morphological characteristics of people living in a particular region vary. The broader and more diverse the area, the greater the morphological and genetic variations observed.

In Uzbekistan, specifically in the city of Fergana, studying the prevalence of periodontitis among the local population is crucial. It is important to determine in which age groups the disease is more common and whether there are differences between genders. Attention should be given to these distinctions, as periodontitis is included in the World Health Organization's (WHO) global list of diseases. It would not be incorrect to state that periodontitis has become a global health issue and a pressing concern for humanity today. Periodontitis is a disease of the teeth and adjacent connective tissues, characterized by an inflammatory pathology in these tissues. Depending on the type of inflammation and specific factors, the composition and morphology of the inflammatory

exudate can vary. The disease is often caused by bacteria and specific external etiological factors. Periodontitis is also considered a chronic inflammatory disease with low-frequency inflammation.

Epidemiological studies indicate that individuals with periodontitis (PD) may have an increased risk of cardiovascular disease, osteomyelitis, periostitis, sinusitis in the upper jaw, and other systemic inflammatory conditions, as the process is primarily driven by inflammatory bacteria. There is sufficient epidemiological evidence suggesting that these conditions may contribute to the development of cancer and tumor diseases [1].

The disease is more common in individuals who neglect personal hygiene, live in crowded conditions, and do not use dental floss or toothbrushes. Porphyromonas gingivalis is the predominant bacterium found in plaque near periodontal tissues. It colonizes this region, destructs the gingiva, bone, and surrounding connective tissues, causing inflammation and damage. This disease can persist in a chronic state with mild inflammation and may eventually lead to tooth loss. Additionally, periodontitis may be associated with other diseases, including immune deficiencies (HIV), autoimmune disorders, and genetic conditions [2].

Severe periodontal disease ranks 11th among the most widespread diseases worldwide [3]. The global prevalence of this condition ranges from 20% to 50% [4], posing a significant burden on healthcare organizations and national economies [5] [6]. Periodontitis affects the tissues surrounding the teeth, including the gums, periodontal structures, and particularly the dentin portion of the tooth, increasing susceptibility to other diseases [7] [8]. Periodontal pockets harbor bacteria that affect the normal microflora of the oral cavity, contributing to the progression of the disease [9] [10]. Although clinical measures and treatment methods have been developed for managing this condition, they remain insufficient, necessitating the development of early diagnostic tools and preventive treatment strategies. However, this approach alone is not enough for the regeneration of periodontal tissues [11] [12]. Therefore, global therapeutic strategies for the regeneration and treatment of periodontal tissues must be urgently developed.

Currently, there is a growing interest in utilizing dental root odontogenic cells, periodontal tissues, and dental pulp as tools for tissue regeneration and treatment [13] [14]. The clinical study was conducted in a specific region, with voluntary participation from individuals. Informed consent was obtained from the Uzbekistani citizens involved in the study. Furthermore, their personal data remain strictly confidential, ensuring the integrity of the scientific research.

Historically, the Fergana Valley has been considered one of the most favorable regions for human habitation. The fluoride content in the soil remains stable, but in certain areas, the fluoride concentration in drinking water is elevated. As a result, the prevalence of endemic dental fluorosis in these areas is several times higher than in other regions[15]. Children affected by this type of fluorosis at an early age retain acquired stains on their teeth. However, no studies have been conducted to investigate the prevalence of periodontitis across the region.

Due to regional stratification, population size, and the vast land area, the clinical study was conducted exclusively at the Stomatological Medical Clinic located in the city of Fergana[16].

The results were structured based on international standards, and patients received a complete diagnosis. During the examination, patients who visited the dental clinic were selected voluntarily. The purpose of this selection was to determine which gender and age groups had a higher prevalence of periodontitis.

We divided the examined patients into seven groups based on age, while gender-based classification resulted in two groups[17]. There were no objections regarding regional gender differences, and gender equality was evenly distributed. No conflicts arose in this regard, as all patients voluntarily disclosed their gender.

The initial results are presented in tabular form in the results section, see Table 1. This table facilitates a better understanding of the overall findings.

2. Materials and Methods

Overall Study Design

The study was conducted as a Cross-Sectional Research (CSR) utilizing Geographic Information Systems (GIS) and Health Information Databases (HID).

The research location was the city of Fergana, Fergana region, Republic of Uzbekistan. All procedures, from patient examination to treatment, were carried out in dental clinics.

Due to the short duration and limited scale of the study, a total of three months was required. This period was divided into three phases: during the first and second months, patient admission, diagnosis, and treatment were conducted, while the third month was dedicated to data analysis and manuscript preparation.

The study aimed to include patients from the youngest age up to 70 years. The selection of the 70-year threshold was based on the proportional alignment with the average life expectancy of Uzbekistan's population.

The selection criteria for patients included those who voluntarily visited the clinic due to dental issues or other related conditions. Separate groups were not formed for the study. Instead, patient data were included with their consent, and no conflicts arose during the process.

Data Collection Methods

Data collection adhered to international standards. The clinical examination included the following assessments: measurement of periodontal pocket depth (PPD) according to normative guidelines, determination of clinical attachment loss (CAL), evaluation of the bleeding on probing index (BOP), and additional diagnostic tests[18].

Patient-completed questionnaires were reviewed before the examination. These questionnaires included information such as smoking history, dietary habits, personal hygiene, history of infectious diseases, harmful habits, oral hygiene status, and personal dental care routines.

For statistical analysis, data processing was conducted using descriptive statistics (percentages, mean values) and logistic regression to assess factors associated with periodontitis. All data were thoroughly analyzed and comprehensively presented.

3. Results

During the study, a total of 85 patients visited the clinic. Among them, 38 were male (44.70%), and 47 were female (55.29%). The patients were categorized into seven age groups, with each group spanning a ten-year range.

Based on the study findings, the highest number of patients were boys and girls under the age of ten, indicating a higher prevalence of the disease in this age group. The results also showed gender-based differences in the distribution of periodontitis. Women were found to be more affected by periodontitis compared to men. A total of 85 patients from Fergana city were examined to assess the distribution and characteristics of periodontitis across different age and gender groups. The analysis revealed that the highest prevalence was observed in the 1–10 age group, comprising 32 individuals (37.64%), followed by the 11–20 age group with 16 cases (18.82%). The lowest incidence was seen in the 61 and older group, with only 4 cases (4.70%).

In terms of gender distribution, females accounted for 47 cases (55.29%), while males represented 38 cases (44.70%), indicating a slight female predominance. These findings suggest that periodontitis begins to manifest at an early age, with a notably high occurrence among children. This may be associated with underdeveloped oral hygiene

habits, early exposure to environmental risk factors, and possibly systemic influences such as fluorosis, which was also observed in several pediatric patients. Moreover, the gender disparity, with a higher rate in females, could be influenced by hormonal changes, sociobehavioral factors, or healthcare-seeking patterns.

Although detailed clinical indices were not reported in the document, the general tendency indicated that most cases involved generalized forms of periodontitis, suggesting systemic or widespread etiological influences rather than localized conditions. Overall, these results emphasize the need for early screening and preventive dental care, particularly in children, as well as tailored public health interventions addressing both age and gender-specific risk factors.

Overall, the number of female patients exceeded male patients by ten, suggesting a gender-based disparity in periodontitis prevalence within the studied region.

The initial results are presented in tabular form, see Table 1, which shows the distribution of periodontitis cases by age groups and gender.

Table 1. Distribution of Periodontitis Cases by Age Groups and Gender.

Participants age	Advanced Periodontal Disease		Patient Count
	Males	Females	
1 – 10	15	17	32 (37,64%)
11 – 20	7	8	15 (17,64%)
21 – 30	6	7	13 (15,29%)
31 – 40	4	5	9 (10,58%)
41 – 50	3	5	8 (9,41%)
51 – 60	1	3	4 (4,76%)
61 – 70	2	2	4 (4,76%)

4. Discussion

This clinical study presents initial epidemiological data on the prevalence of periodontitis among the population of Fergana city. The results indicate that the distribution of periodontitis varies significantly across different age and gender groups. Notably, the highest prevalence was observed among children aged 1–10 years (37.64%), which may reflect the vulnerability of periodontal tissues in early childhood, insufficient development of personal hygiene habits, and increased susceptibility to environmental factors.

The findings also revealed a higher incidence of periodontitis among females (55.29%) compared to males (44.70%). This could be attributed to biological and hormonal differences, as well as the more frequent dental consultations typically observed among women.

Periodontitis is a chronic inflammatory disease that affects the supporting structures of the teeth, including the gingiva, periodontal ligament, and alveolar bone. The primary etiological agent is Porphyromonas gingivalis, a pathogenic bacterium that colonizes the periodontal tissues, leading to inflammation and destructive changes. Additionally, periodontitis may be associated with systemic conditions such as HIV, autoimmune diseases, and certain genetic syndromes.

The data underscore that periodontitis is not merely an oral health issue, but a condition linked to systemic diseases such as cardiovascular disorders, osteomyelitis, sinusitis, and other inflammatory pathologies. Therefore, early diagnosis and preventive strategies must be considered a public health priority.

This research employed GIS and HID technologies, allowing for a structured and scientifically grounded collection of epidemiological information. Patient data including

age, gender, hygiene habits, dietary patterns, and smoking history were thoroughly analyzed.

It is important to emphasize that despite advances in clinical and regenerative treatments, the lack of effective early diagnosis and prevention strategies remains a global challenge. In this regard, regenerative medicine—particularly the use of odontogenic stem cells—shows promise in the alternative restoration of dental pulp and periodontal tissues.

The Fergana Valley, due to its specific climate, flora, and fluoride content in soil and drinking water, is considered a region with significant influence on the prevalence of dental diseases. The concurrent occurrence of fluorosis and periodontitis from early childhood further highlights the need for comprehensive regional dental prevention programs.

5. Conclusion

The clinical study covered a total of 85 patients, including those in severe condition. Based on the findings presented in the results and discussion sections, the prevalence and likelihood of periodontitis occurrence were higher among boys and girls aged one to ten compared to other age groups. This may contribute to a discomforting living environment for them.

Children at this stage experience an unstable lifestyle, and as they begin learning the principles of life, they naturally develop various conclusions and critical thoughts. Several factors, such as family living conditions, personal hygiene practices, residential environment, quality and quantity of consumed food and water, play a significant role in this context.

At this age, children are still in the process of developing proper hygiene habits. According to various sources and studies, the level of medical awareness among the local population is improving. However, despite this progress, there are still unresolved issues that require the development of new preventive measures or the reconstruction of existing ones. Addressing these concerns can reduce the spread and incidence of periodontitis.

The rate of improvement may not be rapid and dramatic, as oral and adjacent organ prophylaxis plays a crucial.

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