

Exploring the interplay between periodontal disease and metabolic health: Implications for Pre-Diabetes and Type-2 Diabetes risk¹Imran Shaik, Public health dentistry, Student, Sacred Heart University, New York, USA**Corresponding Author:** Imran Shaik, Public health dentistry, Student, Sacred Heart University, New York, USA**Citation of this Article:** Imran Shaik, “Exploring the interplay between periodontal disease and metabolic health: Implications for Pre-Diabetes and Type-2 Diabetes risk”, IJDSIR- April – 2024, Volume –7, Issue - 2, P. No. 122 – 132.**Copyright:** © 2024, Imran Shaik, et al. This is an open access journal and article distributed under the terms of the creative common’s attribution non-commercial License. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given, and the new creations are licensed under the identical terms.**Type of Publication:** Review Article**Conflicts of Interest:** Nil**Abstract**

Periodontal disease (PD) and diabetes mellitus (DM) are two common chronic illnesses that have a big impact on public health worldwide. Numerous studies have examined the bidirectional link between DM and PD, emphasizing the complicated relationships between oral and systemic health. With a focus on elderly patients visiting dentistry clinics, this study examines the relationship between diabetes mellitus (DM), specifically type 2 diabetes (T2DM), pre-diabetes, and Parkinson's disease (PD). This population's prevalence of pre-diabetes and undiagnosed diabetes, as well as the risk factors linked to them, are investigated. The results highlight the significance of comprehending the relationship between Parkinson's disease (PD) and metabolic health in the elderly population for efficient disease prevention and treatment.

Keywords: Diabetes mellitus, periodontal disease, type 2 diabetes, pre-diabetes, elderly patients, dental clinic.**Introduction**

Periodontal disease is a common chronic illness that affects millions of people worldwide. It happens by

infection or loss of the connective tissue surrounding the teeth. The complex link between persistent health, especially metabolic illnesses like diabetes mellitus and periodontal disease has been the subject of trending research over the past few decades. Global public health is greatly challenged by diabetes mellitus, a metabolic disorder that results in hyperglycemia from either lack of insulin or insufficient insulin production [1].

Diabetes, sometimes referred to as diabetes mellitus is a chronic metabolic condition characterized by elevated blood glucose levels (hyperglycemia) that is caused by deficiencies in the action or synthesis of insulin or both. Because it facilitates the cellular uptake of glucose and its use for either energy production or storage. In order to regulate blood glucose levels, the pancreatic hormone insulin is necessary. Insufficient insulin synthesis characterizes type 1 diabetes, while inadequate glucose absorption and cell resistance to insulin's effects characterize type 2 diabetes. Diabetes type 1 often first manifests in early adulthood or adolescence but can strike at any age. It is sometimes addressed to as juvenile-onset diabetes or insulin-dependent diabetes.

The autoimmune attack of the pancreatic beta cells responsible for producing insulin results in a total absence of insulin, which is its defining feature [2]. For those with type 1 diabetes to survive throughout their lives, insulin therapy is essential. Type 2 diabetes, previously referred to as adult-onset diabetes or non-insulin-dependent diabetes, accounts for the majority of diabetes cases globally. Even while bad exercise habits and weight gain are more prevalent in childhood and teenagers, it generally shows up in old age. When a person has type 2 diabetes, their body becomes resistant to insulin and their pancreas may not be able to generate enough of the hormone to reverse this resistance. High risk factors for type 2 diabetes include being overweight, not exercising, ageing, ethnicity, and a family history of the disease.

There is a strong emphasis in scientific study on the reciprocal relationship between diabetes mellitus and periodontal disease. Research employing epidemiological techniques has consistently demonstrated that individuals with diabetes have a higher frequency and severity of periodontal disease compared to those without the illness, and that those who already have periodontal disease are more likely to develop diabetes. Complex and diverse mechanisms involving various physiological, immunological, and metabolic systems support this connection.

Stress has a major role in the pathogenesis of both diabetes and periodontal disease. When periodontal bacteria and their metabolites trigger an inflammatory response in the periodontal tissues, pro-inflammatory cytokines and regulators are produced. These inflammatory chemicals have the ability to penetrate the bloodstream and hence exacerbate insulin resistance and chronic inflammation. On the other hand, diabetes's hyperglycemic condition can worsen periodontal

inflammation, hinder the healing of wounds, and weaken the host's defenses against periodontal infections.

In addition to inflammation, systemic immune disorder, oxidative damage, a breakdown of endothelial cells, and changes in the gut microbiota are further pathways that connect dental decay and diabetes. According to new research, diabetes and periodontal disease may acquire and worsen as a result of symbiosis of the gut and mouth microbiomes. The notion that these two illnesses are linked is further evidenced by the common risk factors they share, which include genetic susceptibility, obesity, poor nutrition, and sedentary lifestyle [3].

Even though the amount of data between diabetes and periodontal disease is increasing, more investigation is still required to clarify the underlying processes. Furthermore, previous researches show how periodontal therapy affects diabetes patient's glucose level, but it is still unclear what the best treatment plans are for those who have both diseases. For the purpose of promoting dental and systemic health and preventing disease, it is essential to comprehend how diabetes and periodontal disease interact.

The purpose of this paper is to examine the body of research on the relationship between type 2 diabetes and pre-diabetes, particularly in older patients who visit dentistry clinics. In order to increase our knowledge of the connection between periodontal disease and metabolic health in older persons, this study will look at the frequency of undiagnosed diabetes and prediabetes in this cohort and find associated risk factors.

Literature review

Numerous epidemiological research and clinical trials have provided ample evidence of the link between diabetes mellitus (DM) and Parkinson's disease (PD). According to a systematic review and meta-analysis by,

there is a substantial positive correlation between the risk of getting type 2 diabetes (T2DM) and Parkinson's disease (PD), with those who have PD having a greater risk than those who do not [4].

Chronic inflammation is thought to be a key factor in the pathophysiology of both Parkinson's disease and diabetes mellitus. Periodontal bacteria cause an inflammatory reaction in the periodontal tissues of people with Parkinson's disease (PD), which results in the production of pro-inflammatory mediators and cytokines. These inflammatory chemicals have the ability to enter the bloodstream and contribute to insulin resistance and systemic inflammation, two important aspects of diabetes mellitus. On the other hand, DM-related hyperglycemia can worsen periodontal inflammation, hinder the healing of wounds, and weaken the host's defenses against periodontal infections.

Oxidative stress, immunological dysregulation, endothelial disorder, and changes in the oral microbiome are further processes that connect diabetes mellitus with Parkinson's disease. An association between gut health, systemic irritation, and metabolic control may exist, since recent research has demonstrated the significance of dysbiosis in the oral and gut microbiota in the pathophysiology of both disorders.

There are still a number of unknowns regarding the relationship between DM, T2DM, pre-diabetes, and Parkinson's disease (PD), despite tremendous progress in our understanding. To determine the precise mechanisms generating this association, establish causation, and create tailored interventions for populations that are at risk, more research is required. Furthermore, more research is needed to determine the best management plans for people with both PD and

DM, underscoring the need of multidisciplinary care approaches in dentistry and medical settings. Numerous research papers on the subject were examined.

In this paper, Leite et al. (2013) proposed around 285 million individuals worldwide currently have type 2 diabetes mellitus (T2DM), a number that is predicted to rise by 50% by 2030. The relationship between type 2 diabetes and dental health, namely periodontal disease, is examined in this article. There is a paucity of awareness among patients and healthcare workers despite data relating dental health to type 2 diabetes. Physician knowledge of oral symptoms of diabetes is essential for early diagnosis and referrals. Diabetes and periodontitis are strongly correlated, which emphasizes the necessity for comprehensive care, particularly in underprivileged groups. Research indicates that people with diabetes have low oral health knowledge and few dental visits on a regular basis. Although inflammation is a major factor in their relationship, it is yet unknown how periodontal disease affects glycemic control. Preventive interventions are emphasized in evidence-based care for both illnesses. Engaging oral health practitioners in diabetes screening can improve preventative measures and make healthcare more accessible to people who do not see doctors on a regular basis [1].

In this paper, Lalla et al. (2011) proposed an established risk factor for periodontal disease, the author highlights the close relationship between diabetes mellitus and periodontitis. Mechanistic research indicates that diabetes speeds up periodontal disease by causing gum inflammation and poor gum repair. Periodontitis may exacerbate glycemic control in diabetic patients and increase the risk of diabetic difficulties, indicating a reciprocal link. Blood sugar levels in diabetic people may slightly improve with treatment for periodontal

disease. In order to effectively treat these related disorders, the author emphasizes the value of patient education and cooperation between dental and medical practitioners [2].

The Lakschevitz and Aboodi (2011) emphasizes the known connection between diabetes and periodontal illnesses, stressing that diabetes increases the chance of developing periodontal disease. Compared to people without diabetes, diabetic patients frequently have more severe periodontitis and gum inflammation. Reviewing research conducted in the last fifteen years, the study confirms that poorly managed diabetes raises the risk of severe periodontitis, which can cause damage to oral tissue and bone as well as eventual tooth loss. Although there is disagreement on the effect of periodontal disease on glycemic control in type 1 diabetes, data points to a clear relationship between periodontal health and glycemic control in type 2 diabetes. Furthermore, numerous research findings suggest that treating periodontal disease improves metabolic regulation in individuals with type 2 diabetes [3].

In this paper, Hugoson (1989) compared the prevalence and severity of periodontal disease in those with insulin-dependent diabetes and those without it was the study's main goal. Aged 20 to 70, it included 82 long-duration diabetics, 72 short-duration diabetics, and 77 non-diabetics. The findings revealed no appreciable variations in the number of teeth or amount of plaque between the diabetes and non-diabetic groups. Gingivitis rates were higher in diabetics, nevertheless. Compared to non-diabetics, all long-duration diabetics had more areas with deep pockets and significant alveolar bone loss, but those under 45 had the greatest depth of pockets. This shows that long-term diabetics, particularly those in specific age groups, have higher rates of periodontal disease [4].

In this paper, Lalla et al. (2007) proposed compared the periodontal health of young people with diabetes to that of non-diabetic controls was the goal of the study. They looked at 350 people aged 6 to 18 who had diabetes and 350 who did not. The findings indicated that diabetes participants had more gingival inflammation and connection loss. All age groups had a strong correlation between diabetes and periodontal damage, according to statistical analysis. These results emphasize how critical it is to start treating periodontal care at a young age for children with diabetes [5].

In this paper, Takeda et al. (2006) proposed the goal of the study was to find biomarkers linked to type 2 diabetes patients' developing and worsening periodontitis. They evaluated the periodontal and diabetes states of 97 diabetic individuals, both with and without periodontitis. While other serum indicators and bacterial occurrences did not clearly correlate with periodontal degeneration, serum advanced glycation end products (AGEs) did. This implies that AGEs could be helpful biomarkers for the advancement of diabetic periodontitis [6].

In this paper, Monea et al. (2001) proposed the study and compare salivary flow rates with subjective symptoms of xerostomia and examine the effects of type 2 diabetes and alterations in glycemic management on salivary flow in older persons. In a one-year follow-up research, participants were 24 diabetics and 15 non-diabetic controls, ages 54-90. Age, sex, and length of diabetes did not impact triggered parotid saliva flow rates; however, poor glycemic management was associated with reduced flow rates. Patients with diabetes complained of increased thirst but not xerostomia. Glycemic control and flow rates did not significantly alter throughout the course of the year. This implies decreased salivary flow in diabetics with

poorly managed conditions who do not experience xerostomia symptoms [7].

In this paper, Chavada (1993) proposed the study that measured the gingival, periodontal, calculus, and plaque indices in 62 uncontrolled diabetes patients and 60 non-diabetic patients between the ages of 35 and 66. Additionally, they looked into the relationship between blood sugar and salivary calcium levels and periodontal and lime deposition health. The findings showed that in patients with chronic diabetes, periodontal and oral hygiene indices increased over time. Furthermore, individuals with uncontrolled diabetes had noticeably higher salivary calcium levels, which exacerbated the severity of periodontal disease and promoted the production of calculus [8].

In this paper, Gensini et al. (1992) proposed diabetes can lead to oral issues such as gingivitis and periodontitis, which are more common in persons with the disease. It's still unclear, though, exactly how diabetes and these dental conditions are related. According to recent research, diabetes may contribute systemically to the development of gingivitis and periodontitis by fostering the right microbiological environment. Periodontal disease is caused by certain bacteria that live in the periodontal pocket and release compounds that damage oral tissues. One reason for this vulnerability in diabetics is decreased neutrophil function. Through improved leukocyte activity and altered gingival fluid composition, better metabolic regulation can reduce the incidence and severity of periodontal disease. Diabetes patients' periodontal health is also influenced by local variables, such as decreased salivary flow and pH [9].

In this paper, Nichols et al. (1978) proposed standard methods were used to thoroughly evaluate periodontal disease in a group of 54 patients with diabetes mellitus.

The purpose of the study was to investigate any potential correlations between the severity of diabetes mellitus and periodontal disease. On the other hand, no meaningful correlations were discovered between the severity of periodontal disease and the length of diabetes, the kind of therapy, or the frequency of systemic problems. It seems that the same variables that affected periodontal disease in non-diabetic individuals also affected it in diabetes patients, including calculus, plaque, and negligence. For more thorough insights, the author recommends bigger sample sizes in future research [10].

In this paper, Păunică et al. (2023) proposed bacterial plaque-induced periodontitis damages the supporting tissues of teeth and has a reciprocal interaction with diabetes. Diabetes exacerbates periodontal disease, and glycemic control is compromised by periodontitis. Recent research on the pathophysiology, treatment, and prevention of these diseases as well as oral microbiome, inflammatory variables, and microvascular complications is highlighted in this review. It highlights the necessity of individualized care and additional study to properly handle this intricate interplay [11].

In this paper, Nazir (2017) proposed a large percentage of people worldwide suffer from periodontal diseases, which have several risk factors such as age, anxiety, diabetes, smoking, poor dental hygiene, and inheritance. Systemic disorders such as diabetes, heart disease, and unfavorable pregnancy outcomes are associated with these diseases. For instance, type 2 diabetics are more likely to die if they have severe periodontitis. Patients with diabetes may have better glycemic control with periodontal treatment. To lessen the burden of chronic diseases on healthcare systems, preventative techniques for oral disorders should be incorporated into these initiatives. A greater understanding of the relationship

between systemic and periodontal health among medical practitioners is necessary for efficient referral and specialized treatment [12].

In this paper, Auerbacher et al. (2021) proposed the study. Its objective was to evaluate dental care and oral health in individuals receiving treatment at a dental center for the disabled who had neurological and cerebrovascular illnesses. Periodontal screening index (PSI), decaying, lacking, and filled teeth are examples of oral health indicators. In addition to 30 controls, they were assessed in 152 patients with dementia, Parkinson's disease, numerous sclerosis, and CVD. Comparing patients with neurodegenerative or CVDs to controls, the former group had noticeably worse oral health, with greater DMFT, more decaying teeth, and fewer filled teeth. Additionally, they underwent fewer preventive and prosthetic therapies but more surgical ones. Frequency of brushing and the use of electric toothbrushes were related with decreased DMFT in these individuals, but smoking was connected to greater DMFT. The results highlight the significance of early intervention and customized dental treatment for people with disabilities in order to enhance oral health outcomes [13].

In this paper, Zhou et al. (2015) review examines how diabetes mellitus and periodontitis are inversely correlated, with each ailment raising the likelihood and extent of the other. This association is influenced by hyperlipidemia, a condition marked by an excess of lipids in the blood, which increases the risk of periodontitis and diabetes. On the other hand, hyperlipidemia can result from diabetes and periodontitis. The purpose of the review is to examine the mechanisms behind the synergistic interactions of hyperlipidemia with diabetes and periodontitis. Hyperlipidemia has an impact on the release of insulin

and the synthesis of pro-inflammatory cytokines like $\text{TNF-}\alpha$ and $\text{IL-1}\beta$, which aid in the development of both conditions. A model emphasizing the part hyperlipidemia plays in the connection between diabetes and periodontitis is put out in the assessment. It implies that the clinical treatment of both disorders may benefit from therapeutic approaches aimed at addressing hyperlipidemia [14].

In this paper, Quadri et al. (2020) proposed limited existing research on this issue, the study sought to determine if uncontrolled type 2 diabetes mellitus (T2DM) and periodontitis are related in Saudi Arabian individuals. In a case-control research, persons with a diagnosis of periodontitis were contrasted to controls who had healthy gums and were matched for age, sex, and geography. HbA1c values were used to evaluate diabetes. According to the investigation, persons in Saudi Arabia with uncontrolled type 2 diabetes had a much greater risk of getting periodontitis than those without the disease. Diabetics were shown to have approximately three times the risk of acquiring periodontitis. Smoking and poor dental hygiene were identified as significant risk factors in secondary studies. The study highlights the significance of early identification and management of periodontitis among Saudi Arabian patients and healthcare providers [15].

Listed below is table 1 that shows the comparative analysis of different researches that was done to show the relation between periodontal disease and metabolic health.

Table 1: Comparative Analysis

Author/Year	Type of Study	Description	Conclusion
Leite et al., 2013	Review	Examines the relationship between type 2 diabetes and dental health, highlighting the necessity for patients and medical practitioners to be more aware of this relationship. Explains how diabetes and periodontitis are correlated in both directions and emphasizes the need for comprehensive treatment plans.	Draws attention to how crucial it is to include dental health experts in diabetes screenings in order to enhance preventative measures and access to care.
Lalla, 2011	Review	Highlights the reciprocal interaction between periodontitis and diabetes mellitus and the close connection between the two illnesses. Explains the reasons underlying this association and stresses the need of dental and medical experts working together to provide appropriate care.	Emphasizes the significance of early diagnosis and patient awareness in the management of interrelated illnesses.
Lakschevitz and Aboodi, 2011	Review	Highlights the proven relationship between diabetes and periodontal disorders, emphasizing the risk factors and consequences for the severity of the condition. Examines data indicating that treating periodontal disease can improve people with type 2 diabetes' ability to regulate their metabolism.	Emphasizes how critical it is to treat poorly managed diabetes in order to lower the chance of developing severe periodontitis and its related consequences.
Hugoson, 1989	Observational	Identifies differences in the prevalence and severity of periodontal disease between people on insulin and those who do not, with a focus on evaluating the effect of diabetes duration on periodontal health.	Indicates a higher degree of periodontal disease severity among long-term diabetics, particularly in specific age groups.
Lalla et al., 2007	Observational	Compares the periodontal health of kids and teens with diabetes to that of non-diabetic controls, emphasizing the two factors of gingival inflammation and attachment loss.	Draws attention to the substantial link between diabetes and periodontal disease in people of all ages, stressing the need of early periodontal treatment for children with diabetes.

Takeda et al., 2006	Observational	Examines the relationship between serum advanced glycation end products (AGEs) and periodontal degeneration in patients with type 2 diabetes in order to identify possible biomarkers for the development of diabetic periodontitis.	Implies that AGEs could be helpful biomarkers for the treatment and surveillance of diabetic periodontitis.
Monea et al., 2001	Longitudinal Study	Examines the effects of type 2 diabetes and modifications to glycemic management on salivary flow in the elderly, evaluating associations with self-reported xerostomia symptoms.	Shows reduced salivary flow in diabetics with poorly managed diabetes who do not also have xerostomia symptoms, highlighting the significance of glycemic control for salivary function.
Chavada, 1993	Observational	Focuses on evaluating the plaque, calculus, and periodontal indices in patients with unregulated diabetes to examine the impact of diabetes mellitus on the extent of periodontal disease.	Shows that in individuals with uncontrolled diabetes, periodontal disease severity is likely to worsen with time, as seen by rising periodontal and oral hygiene indices.
Gensini et al., 1992	Review	Examines the connection between diabetes and periodontal illnesses, with an emphasis on the local and systemic elements that affect diabetics' periodontal health.	Highlights the need of better metabolic control and treating local variables in diabetic individuals to prevent periodontal infections.
Nichols et al., 1978	Observational	Examines the relationship between the extent of periodontal disease and diabetes mellitus, with a focus on evaluating the effects of systemic issues, type of therapy, and length of diabetes.	Discovers no meaningful correlations between diabetes-related variables and the severity of periodontal disease, pointing instead to the impact of common components such as calculus and plaque.
Păunică et al., 2023	Review	Examines current research on the reciprocal association between diabetes mellitus and periodontal disease, emphasizing the part hyperlipidemia plays in this interaction and going over possible treatment approaches.	Highlights the necessity of more study and personalized treatment plans in order to properly manage the intricate relationship between diabetes and periodontitis.
Nazir, 2017	Review	Argues for the use of integrated preventive techniques in the treatment of chronic diseases by discussing the frequency of	Draws attention to the necessity of raising healthcare providers' knowledge of the relationship between

		periodontal disorders and their systemic links.	systemic and periodontal health in order to facilitate efficient referrals and specialized treatment.
Auerbacher et al., 2021	Observational	Evaluates the dental health and care of patients suffering from neurodegenerative and cerebrovascular illnesses, analyzing the differences between the patients and the controls to determine the variables affecting the patients' oral health.	Demonstrates the value of early intervention and specialized dental care for people with disabilities in order to enhance oral health outcomes, especially for those suffering from cerebrovascular and neurodegenerative disorders.
Zhou et al., 2015	Review	Examines the reciprocal relationship that exists between hyperlipidemia, diabetes mellitus, and periodontitis; it also discusses how hyperlipidemia exacerbates these disorders and suggests treatment options for it.	Indicates that the clinical management of diabetes mellitus and periodontitis may benefit from therapeutic approaches aimed at reducing hyperlipidemia.
Quadri et al., 2020	Case-Control Study	Examines the relationship between persons with uncontrolled type 2 diabetes mellitus and periodontitis in Saudi Arabia, highlighting the importance of early detection and treatment of periodontitis in diabetic patients.	Verifies the strong correlation between uncontrolled type 2 diabetes mellitus and periodontitis in adult Saudi Arabians, emphasizing the additional risk factors of smoking and poor oral hygiene.

Methodology

The process used in this study was a methodical approach to finding, evaluating, and compiling pertinent research on the relationship between periodontal disease (PD) and diabetes mellitus (DM), specifically type 2 diabetes (T2DM) and pre-diabetes, in elderly patients who visit dental clinics. An extensive search plan including publications published through 2023 was created using electronic databases such as PubMed, Scopus, Web of Science, and Google Scholar. Keyword combinations like "diabetes mellitus," "type 2 diabetes," "pre-diabetes," "periodontitis," "periodontitis disease," "oral health," "elderly patients," and "dental clinics" were among the search terms. Two impartial reviewers

evaluated the full-text articles of possibly relevant studies for additional evaluation after screening the titles and abstracts of retrieved publications to determine whether they met the predetermined criteria for inclusion. A standardized data extraction form was used to obtain data from studies that matched the eligibility criteria. This data included study information, participant demographics, methodological specifics, and important findings. Data synthesis involved highlighting important findings and identifying recurring themes in the included research. The quality assessment of the included studies was carried out using applicable instruments or criteria related to the study design. The interpretation of the results took into account potential

review limitations such as heterogeneity between studies and publication bias. Analyzing already-published data satisfied ethical requirements without seeking ethical permission. This meticulous approach guarantees the authenticity and dependability of the results given in this paper's later sections.

Information Sources

To find pertinent research published up until 2023, a thorough search of electronic databases including PubMed, Scopus, Web of Science, and Google Scholar was carried out. Keywords linked to periodontitis, oral health, dental clinics, PD, DM, T2DM, pre-diabetes, and senior patients were included in the search approach. Research that examined the relationship between pre-diabetes, DM, T2DM, and PD in elderly people visiting dentistry clinics was accepted for the analysis.

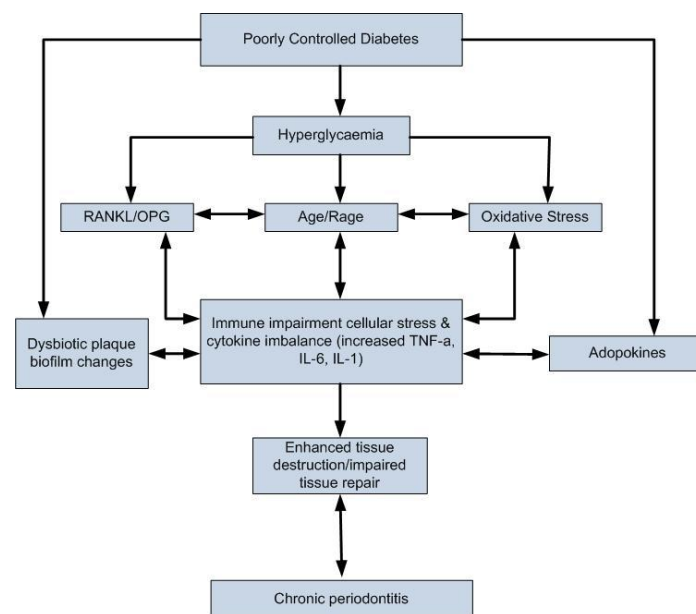
Discussion

In elderly patients visiting dental clinics, the results of this review demonstrate the strong correlation between PD and DM, specifically T2DM and pre-diabetes. The high proportion of pre-diabetes and undiagnosed DM in this population emphasizes the significance of frequent screening and early detection techniques in dentistry settings [8]. Finding shared risk factors between diabetes and Parkinson's disease (PD) and DM can help guide focused interventions meant to enhance oral hygiene and metabolic health in the elderly.

Fig 1. Shows the impact of diabetes on Periodontitis. Diabetes and periodontitis have a complicated, reciprocal interaction. diabetic, in particular type 2 diabetic mellitus (T2DM), has a major impact on how periodontal disease begins and progresses. Diabetes increases the risk of developing periodontitis because of increased inflammatory responses, compromised healing, alterations in the immune system, inadequate glycemic control, and microvascular consequences. The

combination of high blood sugar, weakened immunity, and long-term systemic inflammation fosters the development of bacteria and gum tissue damage.

Figure 1: Impact of diabetes on Periodontitis



Conclusion

To conclude, the reviewed literature clearly shows a correlation between DM, T2DM, pre-diabetes, and PD in older patients visiting dental clinics. For early identification and problem avoidance, routine screening for undiagnosed diabetic mellitus (DM) and pre-diabetes is crucial, as is the completion of thorough dental health evaluations. The implementation of comprehensive methods to disease treatment and the promotion of general health and well-being in older persons require multidisciplinary coordination between dental and medical specialists.

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