Universal Library of Medical and Health Sciences Research Article

ISSN: 3064-6545 | Volume 1, Issue 1

Open Access | PP: 32-40

DOI: https://doi.org/10.70315/uloap.ulmhs.2023.0101005

The Role of Oral Health in the Prevention of Systemic Diseases

Prof. Dr. Willie Sai Ho Chan, LLB, MD.

The Queen's College, Hong Kong, China.

The China Medical University, Taichung, Taiwan, China.

Http://www.epmanet.eu/

Abstract

Oral health plays a crucial role in maintaining overall well-being , as it is closely linked to the prevention of systemic diseases. This abstract aims to provide a comprehensive overview of the relationship between oral health and systemic diseases, highlighting the importance of oral hygiene practices and regular dental care in disease prevention. Numerous studies have established a strong association between poor oral health and various systemic diseases, including cardiovascular diseases, diabetes mellitus, respiratory infections, and adverse pregnancy outcomes. The oral cavity serves as a gateway to the body, and the presence of oral infections; such as periodontal disease, can lead to the dissemination of bacteria and inflammatory mediators throughout the bloodstream, contributing to the development and progression of systemic diseases.

Periodontal disease, a chronic inflammatory conditions affecting the supporting structures of the teeth, has been extensively studied in relation to systemic diseases. The inflammatory response triggered by periodontal pathogens can promote atherosclerosis, increasing the risk of cardiovascular diseases. Additionally, the chronic inflammation associated with periodontal disease may exacerbate insulin resistance, leading to the development and poor control of diabetes mellitus.

Furthermore, oral health has been implicated in respiratory health. Poor oral hygiene and untreated oral infections can contribute to the colonization of respiratory pathogens, increasing the risk of respiratory infections, such as pneumonia. The aspiration of oral bacteria into the lungs can also exacerbate existing respiratory conditions, such as chronic obstructive pulmonary disease (COPD). Pregnant women with poor oral health are at an increased risk of adverse pregnancy outcomes, including preterm birth and low birth weight. Oral infections, particularly periodontal disease, have been linked to systemic inflammation and the release of pro-inflammatory cytokines, which can potentially affect fetal development and lead to complications during pregnancy. Prevention and management of systemic diseases through oral health maintenance involve adopting good oral hygiene practices, such as regular brushing, flossing, and the use of antimicrobial mouthwashes. Additionally, routine dental check-ups and professional cleanings are essential for early detection and treatment of oral diseases. Dental professionals play a crucial role in educating individuals about the importance of oral health and its impact on systemic well-being. Hence, maintaining optimal oral health is vital for the prevention of systemic diseases. The link between oral health and conditions such as cardiovascular diseases, diabetes mellitus, respiratory infections, and adverse pregnancy outcomes highlights the need for comprehensive oral care.

Keywords: *Dental Caries; Plaque; Tooth Decay; Immune System; Ecosystem; Public Health; Systemic Diseases; Periodontitis; Sleep Apnea; Gum Disease.*

INTRODUCTION

The mouth serves as the entrance to the rest of the body, allowing bacteria to potentially enter the lungs, intestines, and genitourinary tract. When a person's overall health is compromised, typically harmless oral bacteria can become harmful and cause infections locally or affect other areas (1) of the body. The relationship between oral and systemic health is multi-faceted and involves numerous pathways. Oral health is integrally linked to overall well-being. The oral cavity contains a diverse range of micro-organisms, forming a complex ecosystem that can greatly influence overall health. Research has demonstrated that the decline in oral health can affect the severity of chronic systemic illnesses, as well as nutrition, hydration, and psychological and social well-being.

The recent literature shows that oral health has the potential to affect multiple organs in the body. These effects can range from insulin issues caused by periodontal disease to more complicated systemic complications involving the cardiovascular system and even neurodegenerative (2) diseases. Neglecting regular oral hygiene can seriously, leading to various oral health problems. Here are three significant issues that can occur due to a lack of proper oral hygiene.

Bad Breath (Halitosis)

Poor oral hygiene can lead to persistent bad breath or

halitosis. The mouth's bacteria and food particles can release noxious gases contributing to bad breath odour. These bacteria can accumulate on the tongue, and the teeth, and around the gumline. The bacteria multiply without regular brushing and flossing to remove them, resulting in chronic bad breath. Moreover, untreated oral infections and gum disease can also contribute to halitosis. Regular oral hygiene practices, including tongue scraping, can help eliminate odor-causing bacteria and freshen your breath. It is important to note that persistent bad breath may indicate underlying oral health issues that require professional assessment and treatment. The connection between bad oral hygiene and oral cancer underscores the significance of having excellent oral health. Failure to maintain proper oral hygiene can result in the buildup of plaque and bacteria, which heightens the chances of developing gum disease, tooth decay, and ultimately oral cancer.

Tooth Decay and Cavities

Decay can occur when plaque and bacteria accumulate on the tooth surfaces due to neglecting oral hygiene. The acids eventually produced by oral bacteria when they feed on the sugars and starches in meals destroy tooth enamel. The result is the cavities, permanently damaged areas in the tooth structure. Cavities can cause tooth sensitivity, pain, and difficulty eating. If left untreated, they can progress deeper into the tooth, affecting the pulp and necessitating more extensive dental treatments like root canals or extractions. Regular brushing and flossing help remove plaque, reducing the risk of tooth decay and cavities. Maintaining a healthy diet low in sugary and acidic foods and beverages supports oral health and prevents corrosion.

Gum Disease

Poor oral hygiene is a primary cause of gum disease, encompassing two stages:-

(a) Gingivitis; (b) Periodontitis.

The gums exhibit inflammation and bleeding as distinguishing features of gingivitis.

It can progress to periodontitis, where the bacteria invade the underlying tissues and cause further damage. Symptoms that patients with gum disease may encounter include swollen and sensitive gums, chronic halitosis, teeth that feel loose, and alterations in their bite.

Treating gum disease often requires professional intervention, including deep cleaning, antibiotic therapy, and, in severe cases, surgical procedures. Regular oral hygiene parctices are crucial in preventing and managing gum disease. Research has indicated that people who have gum disease have a higher likelihood of developing pancreatic cancer. Moreover, poor oral hygiene contributes to tooth decay. By feasting on the sugars and carbohydrates from food, the bacteria in the mouth make acids that destroy tooth enamel. Over time, this can result in cavities, tooth sensitivity, and even tooth loss. In addition, untreated gum disease and tooth decay can lead to chronic bad breath, toothaches, and oral infections. Additionally, several systemic health problems outside of the mouth, including cardiovascular disease, complications from diabetes (3), respiratory infections, and unfavorable pregnancy outcomes, have been associated with poor oral hygienes. Proper oral hygiene is crucial for preserving oral health, preventing dental problems, and promoting overall well-being.

The Act of Preventing Bacteremia and Endocarditis

The negative impact on overall health caused by oral infections is primarily due to oral micro-organisms or their byproducts entering the bloodstream, a condition known as bacteremia. It seems that periodontal bacteria or their byproducts can directly invade the periodontal tissues and then spread to the rest of the body, attaching to damaged heart valves surfaces. The most effective way to prevent bacteremia is by reducing gingival (4) inflammation and the buildup of periodontal bacteria through proper oral hygiene practices. Patients who are susceptible to endocarditis may need antibiotics before undergoing major oral surgical procedures. Infectious oral microbes can lead to various systemic diseases, particularly in individuals with weakened immune systems or nutritional deficiencies, as these microbes can gain access to the rest of the body.

Evidence has been building that poor dental hygiene is associated with 16 diseases:-

Cancer

If one ignores their oral hygiene, plaque and bacteria can build up in the mouth, raising the chances of developing oral problems (5,6) like gum disease and tooth decay. If these issues are not addressed, they can potentially progress into oral cancer, a malignant illness that affects the mouth and throat, severely impacting an individual's overall well-being and quality of life. It is often preceded by warning signs, such as persistent mouth sores, difficulty swallowing, or a lump in the mouth or throat. Early detection and diagnosis are crucial for successful treatment, highlighting the importance of regular dental check-ups and professional cleanings. Making good oral hygiene a priority and getting prompt dental care (7) can dramatically lower a person's risk of acquiring oral cancer.

Oral and pharyngeal cancers have the highest fatality rate among all oral diseases. The primary causes of these cancers are tobacco use, excessive alcohol consumption, and an unhealthy diet, which together contribute to more than 90% of head and neck cancer cases. Alcohol and tobacco have a synergistic effect on increasing the risk of cancers in the upper respiratory and digestive systems. The rise in oral cancer cases in Europe is strongly linked to increased alcohol consumption. Moreover, alcohol use is also associated with an elevated risk of cleft palate. The connection between inadequate oral hygiene and oral cancer is well-established, underscoring the importance of maintaining a proper oral care routine (8).

The World Health Organisation (WHO) states that oral diseases consist of various conditions and illnesses, such as dental caries, gum disease, tooth loss, oral cancer, dental injuries, noma, and birth defects like cleft lip and palate. Approximately 3.5 billion individuals are affected by oral diseases, making them one of the most prevalent noncommunicable diseases globally. Therefore, it is crucial to raise awareness and emphasize the significance of maintaining good oral hygiene. Extensive research has established a significant link between periodontal disease and various types of cancer, such as pancreatic cancer, lung cancer, and blood cancer, indicating higher risks for individuals with poor oral health. Moreover, the habit of smoking and using chewing tobacco further elevates the chances of developing oral cancer (9).

Studies have indicated that inadequate oral hygiene can heighten the likelihood of specific cancer types, such as oral, throat, and esophageal cancer, which can metastasize to other body parts. The presence of detrimental bacteria in the mouth resulting from poor oral health practices can trigger inflammation (10) and harm the cells in the mouth and throat, potentially leading to cancer. Timely identification is crucial in managing oral cancer. Nevertheless, it is essential to acknowledge that not all instances of oral cancer stem solely from poor oral health, as other factors may also be involved.

Alzheimer's Disease

Inflamed gums (11) can result from inadequate oral hygiene and contribute to Alzheimer's disease. When bacteria migrate from the mouth to the brain, they can harm brain cells, resulting in memory loss. The presence of oral bacteria due to poor dental care has been linked to the onset of Alzheimer's disease and dementia.

The potential role of spirochetes, a type of pathogenic oral bacteria, in causing Alzheimer's disease has been investigated. It has been found that the presence and occurrence of spirochetes are notably higher in the brains of individuals with Alzheimer's compared to those without the disease. The use of salivary diagnostic testing can identify the presence of these oral pathogens.

Obesity

The role of diet in oral health is crucial, as it is a chronic condition with high mortality and co-morbidity. It is associated with various aspects of oral health, including tooth decay, gum disease, and dry mouth. Oral health professionals are becoming more concerned about the management of oral hygiene and preventive measures, such as fluorides, due to the poor quality and excessive amount and frequency of people's eating habits. Without a healthy diet, oral health is in jeopardy, which ultimately affects overall health.

Infertility

Infertility, as defined by the International Committee for Monitoring Assisted Reproductive Technology and the WHO, is a condition of the reproductive system where couples are unable to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. It is estimated that around 10~15% of couples worldwide experience infertility at some point in their lives. Some studies have found a connection between male factor infertility and dental health, with approximately 30% of male infertility cases having no identifiable cause. Previous research has shown a positive link between deep periodontal pockets and reduced sperm motility, suggesting that periodontitis may play a role in the development of unexplained semen abnormalities.

Women who have infertility (12) problems have been found to have more diseases and are less likely to use oral contraceptives compared to other women. This could be due to the reasons behind their infertility. As infertility and unhealthy alcohol consumption are becoming more prevalent in Western societies, it is important to focus on the lifestyle choices, particularly alcohol use, of women who are struggling with infertility. Based on the existing evidence, there appears to be a connection between male factor infertility and dental health. It is important to note that oral diseases can have an impact on overall health, including men's reproductive health (13).

Hence, it is recommended that patients undergoing andrological examination and seeking to conceive should undergo a thorough oral evaluation (14). Currently, there is a lack of published research on the impact of periodontal disease on the time it takes for women to conceive. However, this disease can result in bacteremia and the release of cytokines, which can affect the implantation process in women undergoing in vitro fertilization. Additionally, there is growing evidence suggesting that periodontitis may have an impact on male sexual health, sex hormone production, and semen quality. However, the exact mechanisms (15) responsible for this association are still not fully understood.

Additionally, it has been linked to abnormalities in semen and reduced sperm movement in men. Other research has indicated that men who have poor oT! al health may experience lower sperm movement. The presence of chronic inflammation caused by periodontitis (16) and advanced tooth decay in women with unexplained infertility should be a significant concern, as it could potentially contribute to the development of infertility.

Periodontal Disease

There are two types --- gingivitis and periodontitis.

Periodontal disease, which is influenced by microbial infections, is a complication that can arise from diabetes (17) and osteoporosis. Other systemic factors, including nutrition, tobacco use, stress, HIV/AIDS, and immunosuppression, also have an impact on oral health. It is worth noting that noncommunicable diseases share several risk factors with periodontal diseases, further affecting their prevalence and severity.

Periodontal disease, caused primarily by gram-negative bacteria (18) such as Aggregatibacter Actinomycetemcomitans, Pophyromonas gingivalis, Prevotella intermedia, Treponema denticola, and Tannerella forsythia, is a chronic and slowly progressing infectious disease that impairs your ability to combat infection and inflammation. Additionally, it heightens the risk of severe systemic health complications.

The oral cavity (19) can easily transfer these particular pathogens to the intestine, which can lead to damage in the tissue supporting the teeth and eventually result in tooth loss. Research has indicated that addressing periodontal disease can have positive effects on overall health (20).

COVID-19

Dysgeusia, which refers to a distorted sense of taste, is the initial oral symptom identified in cases of the novel coronavirus disease (COVID-19). Additionally, oral lesions have been observed in individuals with COVID-19. The development of these oral mucosal lesions can be attributed to various factors such as infections, immunological issues, and psychosocial factors. The main factors (21) that contribute to the development of oral lesions in COVID-19 patients include poor oral hygiene, opportunistic infections, stress, weakened immune system, inflammation of blood vessels, and an exaggerated immune response (22). The occurrence of oral lesions in COVID-19 patients is almost equal between males and females, with 49% being female and 51% being male. Older patients and those with severe cases of COVID-19 tend to have more extensive and severe oral lesions.

The most common locations for oral lesions in COVID-19 patients, listed in descending order, were the tongue (38%), labial mucosa (26%), and palate (22%). In 68% of cases, these oral lesions caused symptoms. Recent research has shown a connection between the severity of COVID-19 and pre-existing chronic conditions like periodontitis. Initial findings suggest that periodontitis (23) may contribute to a more severe course of COVID-19 and an increased risk of death from the disease. This could occur through various direct and indirect pathways.

According to a study published in the Journal of Clinical Periodontology, individuals who have advanced gum disease have a significantly higher risk of experiencing complications from the coronavirus. These complications include a higher likelihood of requiring a ventilator and facing mortality due to the disease. The research, which analyzed over 500 patients, revealed that those with severe gum disease were up to 9 times more likely to succumb to COVID-19. Additionally, patients with the disease were nearly 5 times more likely to require assisted ventilation.

In a recent study published in the Journal of Clinical Periodontology, it was found that individuals suffering from periodontitis, which is the advanced stage of gem disease, were three times more prone to experiencing severe complications , requiring ventilation, or even death due to COVID-19. It is well-known that COVID-19 can trigger an inflammatory response in the body. Considering the potential link between periodontitis and heightened severity (24) of COVID-19, it is crucial to prioritize efforts in enhancing oral and periodontal health. This includes promoting good oral hygiene practices and adopting habits that promote oral health.

Cardiovascular Disease

This disease has some of the highest economic costs. Periodontal disease and cardiovascular disease (25) have been found to have a moderate correlation in several studies. Despite the moderate strength of this association, both diseases are highly prevalent in the population, making periodontal disease a significant public health concern. It is worth noting that a large percentage, ranging from 86% to 90%, of heart disease cases can be prevented. Maintaining proper dental hygiene is one approach to reduce the risk of developing cardiovascular disease.

Additionally, it is important to highlight that periodontal disease is directly connected to inflammation in the arteries.

And, the entry of mouth bacteria into the bloodstream can result in the hardening of arteries, thereby elevating the chances of developing cardiovascular disease.

Kidney Disease

Inadequate oral hygiene can cause inflammation and infection which can spread through the bloodstream, compromising the body's ability to combat infections. Poor oral health can also lead to kidney disease, which in turn increases the risk of cardiovascular disease.

Liver Disease

Recent suggestions propose that the presence of periodontal pathogenic bacteria in the intestines may disrupt the composition of the gut microbiota, potentially serving as a causal link between periodontitis and liver disease. Recent studies in epidemiology have shown that individuals who have liver cirrhosis exhibit significantly worse periodontal clinical indicators compared to those who do not have cirrhosis (26). The administration of periodontal therapy to patients with cirrhosis has a positive impact on the oral and gut microbiome, as well as the progression of systemic inflammation and factors related to the prognosis of cirrhosis. Additionally, both cirrhosis and periodontal disease have the ability to trigger an inflammatory response and generate inflammatory mediators, which can potentially influence each other.

Osteoporosis

The loss of bone density leading to fragile bones, known as systemic osteoporosis, can also affect the facial bones.

Periodontitis results in the loss of attachment and bone, and research has found that it affects bones throughout the body, not just the jawbone and teeth. Studies have shown

that both osteoporosis and periodontal disease are linked to estrogen deficiency, low mineral bone density, and low vitamin D levels. In the later stages of periodontal disease, inflammation and infection lead to a loss of bone tissue. Therefore, individuals with osteoporosis and low bone density in the alveolar bone may be more prone to the rapid progression of periodontitis. By undergoing salivary testing, regular dental check-ups, maintaining proper oral hygiene, and following a suitable diet and supplementation, you can reduce your risk of periodontal disease and bone loss.

Respiratory Diseases

Numerous studies have demonstrated a link between inadequate oral health and respiratory disease. In particular, dental patients, and those who are institutionalized or hospitalized (27). These individuals, due to their impaired ability to swallow, are more susceptible to colonization of potential respiratory pathogens in the oropharynx. The concept of poor dental hygiene contributing to an increased risk of respiratory problems is not a novel concept. Bacteria present in the oral cavity can either be inhaled into the lungs or spread through the bloodstream, leading to respiratory infections. Associations have been discovered between lung infections, pneumonia, bronchitis, and chronic obstructive pulmonary disease. Due to the rise of antibiotic-resistant bacteria, pneumonia is now connected to inadequate oral hygiene and is expected to become more significant in the coming years. This is especially relevant for individuals with weakened immune systems, like the elderly or those with chronic respiratory conditions. Therefore, even a small impact of poor oral health on pneumonia would have significant implications for public health.

Rhematoid Arthritis

Rheumatoid arthritis is characterized by inflammation, and it is well-established that inadequate oral hygiene can lead to periodontal disease, which in turn triggers inflammation in the mouth that can spread throughout the body. A study conducted by John Hopkins University investigated the connection between poor oral health and rheumatoid arthritis. The findings revealed a correlation between the presence of Aggregatibacter Actinomycetemcomitans bacteria and the development of periodontal disease. The inflammatory reaction in the joints of individuals suffering from rheumatoid arthritis bears resemblance to the inflammatory response observed in the oral cavity of patients with periodontal disease.

Obstructive Sleep Apnea

Teeth grinding is considered one initial indications of obstructive sleep apnea, which dentists and hygienists should be vigilant about in all patients. The act of grinding teeth can lead to cavities or swollen gums, making individuals more prone to infections. Additionally, sleep apnea has been associated with elevated blood pressure, heart ailments, and headaches.

Prostate/Erectile Dysfunction

Periodontal disease creates pockets in the mouth that can become infected. When bacteria and infection enter the bloodstream, they can cause inflammation in blood vessels, leading to reduced blood flow to the genitals. A study revealed that men with periodontal disease were three times more prone to experiencing erectile dysfunction compared to those with a healthy mouth.

High-Risk Preterm Birth

According to research conducted by BMC Pregnancy and Childbirth, women with periodontal disease had a six-fold higher risk of giving birth prematurely compared to women without the disease. The bacteria Fusobacterium Nucleatum, which is found in the oral cavity, has been discovered in amniotic fluid, placenta, and chorioamnionic membranes of patients who experienced preterm birth.

Diabetes Mellitus

Systemic health (28) has an impact on oral health, and diabetes mellitus is a prevalent chronic disease seen in dental practice. Diabetes is a significant illness that incurs substantial economic burdens for individuals and healthcare systems. Due to their weakened immune response, individuals with diabetes are more prone to periodontal disease and experience severe periodontal disease at an earlier stage compared to those without diabetes.

Individuals with diabetes who also have periodontal disease encounter challenges in managing their blood sugar levels, resulting in the deterioration of their diabetes condition. Moreover, diabetes respond to periodontal infection with intensified destructive reactions, such as weakened immune response and impaired tissue healing. Consequently, neglecting oral hygiene can create an environment in the mouth that fosters bacterial growth, leading to infections that can exacerbate symptoms of diabetes. And diabetes can worsen oral infections and vice versa, and tooth loss was more likely to occur in adults. Hence, understanding the patho-physiology, clinical manifestations and management of different types of orofacial diseases in diabetic (29) patients are important to the diabetologist and the dentist for the optimal care of patients with these diseases.

Other Related Diseases

HIV/AIDS

Around 40~50% of Individuals who are HIV-positive experience oral lesions, and this number increases to up to 80% for those diagnosed with AIDS. Oral complications associated with AIDS include pain, dry mouth, mucosal infections, and Kaposi's sarcoma. These lesions are among the initial signs of HIV infection and can serve as both an indicator of HIV infection and a predictor of the progression to AIDS.

They have the potential to serve as starting or concluding

points in therapy and vaccine trials, factors influencing opportunistic infections and anti-HIV treatment, and in systems for categorizing and assessing the severity of the disease. With the advancement of new drug treatments that extend the lifespan of individuals with HIV, chronic conditions like periodontal diseases are expected to become increasingly significant challenges in the care of infected patients.

Preterm Birth and Low Birth Weight Infants

Research has demonstrated that periodontal disease can heighten the likelihood of preterm birth, preeclampsia, and low birth weight. Infections are significant contributors to preterm birth, and certain studies indicate a notable correlation between periodontal disease and preterm birth. Throughout pregnancy, there are changes in psychology and behavior that may result in a decreased focus on personal care, including oral hygiene. Additionally, pregnant women undergo metabolic and hormonal changes that could potentially lead to pregnancy gingivitis and pyogenic granuloma. Paying more attention to oral hygiene can reduce the impact by oral bacteria in the mother's body. The oral bacteria may enter the bloodstream, pass through the placenta, and potentially harm the developing fetus. Furthermore, the mother's immune system response to the infection triggers the ongoing release of natural chemical defense mechanisms that can disrupt fetal growth and delivery (30).

Mental Health Diseases (Stress, Depression, Eating Disorders)

Research has shown that there are connections between stressful environmental factors and the condition of the gums. When stress reaches certain levels, it can raise cortisol levels in the body and weaken the immune system's response. Individuals who are depressed often neglect their oral hygiene because they lack motivation to take care of themselves. Depression and the medications used to treat it can also lead to dry mouth and eating disorders, such as anorexia nervosa, bulimia, binge eating, and pica, involve severe patterns and have psychological effects. Treatment is received by only 10% of individuals with eating disorders. Dental destruction (perimolysis), swelling of the parotid gland, and biochemical abnormalities in saliva can be caused by eating disorders. The connection between oral lesions, nutritional deficiency, and eating disorders is still not well understood, as research has provided limited insights.

Inadequate oral health can have negative effects on one's appetite and ability to eat, leading to malnutrition and overall compromised health and well-being. This can be caused by various oral issues in cavities, gum disease, oral pain, tooth loss, dry mouth, poorly fitting dentures, or sore lips or tongue, and sensitivity to temperatures. Consuming a diet that is high in fruits, vegetables, and whole grain food while limiting intake of sugars and fats can greatly improve oral health in multiple ways.

Prescription and Nonprescription Drugs

Medications and other therapies employed to treat systemic diseases and conditions can have a negative impact on the mouth. Both prescription and nonprescription medications frequently result in dry mouth as a side effect. Additionally, they can cause other common issues such as stomatitis, decreased saliva production, changes in taste perception, oral ulcers, and difficulties with eating, chewing, and swallowing (28). These consequences can have an impact on nutrition, adherence to treatment, and overall quality of life.

The Connection between Oral health and Systemic Diseases

The development of systemic diseases can be a consequence of inadequate oral health. The mouth is home to millions of bacteria, and when oral hygiene is not maintained, these bacteria can cause infections that can spread throughout the body. The link between oral health and systemic disease is thought to be mediated by inflammation.

Systemic inflammation can be triggered or worsened by the spread of chronic inflammation from the mouth to other areas of the body (29).

For instance, the most common oral health problems that are associated with systemic disease are periodontal (gum) disease and dental caries (cavities). Systemic inflammation can be attributed to bacteria entering the bloodstream, leading to the development of both of these conditions (30). This can cause the arteries to narrow, leading to an increased risk of heart attack or stroke. Methamphetamine (meth) serves as another illustration, being a potent and extremely addictive stimulant that impacts the central nervous system. It is an inexpensive, easy-to-make, and highly addictive drug. The drug's acidic nature, dry mouth, craving for high-calorie carbonated beverages, and teeth grinding or clenching contribute to the widespread occurrence of severe dental caries. The drug's prolonged duration (12 hours) results in users being unlikely to maintain oral hygiene. This lack of dental care can lead to avoidable pain and discomfort, which can negatively impact children's learning, and academic performance as well as their overall well-being.

Poor oral health can affect adults as well, leading to decreased productivity at work. Consequently it can hinder employability and reduce the efficiency of individuals who are employed.

DISCUSSIONS

Oral health is not limited to maintaining healthy teeth and gums; it also plays a crucial role in preventing systemic diseases. The mouth serves as a gateway to the body, and poor oral hygiene can lead to various health issues beyond the oral cavity. This discussion aims to study the significant role of oral health in preventing systemic diseases and highlight the importance of maintaining good oral hygiene practices.

Link between Oral Health and Systemic Diseases

Cardiovascular Diseases

Research suggests a strong association between gum disease (periodontitis) and cardiovascular diseases. The bacteria present in the mouth can enter the bloodstream through inflamed gums, leading to the formation of plaque in the arteries. This can increase the risk of heart attacks, strokes, and other cardiovascular complications.

Diabetes

Individuals with diabetes are more prone to gum disease due to impaired immune function. Conversely, gum disease can make it difficult to control blood sugar levels, worsening diabetes symptoms. Maintaining good oral health is crucial for diabetic patients to manage their condition effectively.

Respiratory Infections

Poor oral hygiene can contribute to respiratory infections such as pneumonia. Bacteria from the mouth can be inhaled into the lungs, causing infections, particularly in individuals with weakened immune systems or underlying respiratory conditions.

Pregnancy Complications

Pregnant women with gum disease have an increased risk of premature birth, low birth weight, and preeclampsia. The oral bacteria can enter the bloodstream and trigger inflammation, potentially affecting the developing fetus.

Rheumatoid Arthritis

Studies have found a link between gum disease and rheumatoid arthritis. The bacteria associated with periodontitis can activate the immune system, leading to chronic inflammation and exacerbating arthritis symptoms.

Prevention Strategies

Oral Hygiene Education

Promote awareness about the importance of maintaining good oral hygiene practices, such as regular brushing, flossing, and tongue cleaning. Educate individuals on proper techniques and the benefits of maintaining oral health.

Regular Dental Check-ups

Encourage individuals to visit their dentist regularly for routine check-ups and professional cleanings. Regular dental visits can help identify and address oral health issues before they escalate and potentially contribute to systemic diseases.

Health Diet and Nutrition

Emphasize the significance of a balanced diet for oral health. Encourage the consumption of nutrient-rich foods, such as fruits, vegetables, whole grains, and lean proteins, while limiting sugary snacks and beverages that can contribute to dental problems.

Tobacco and Alcohol Cessation

Highlight the detrimental effects of tobacco and excessive alcohol consumption on oral health and overall well-being. Promote smoking cessation programs and resources to help individuals quit smoking. Encourage responsible alcohol consumption or complete abstinence.

Stress Management

Educate individuals about the relationship between stress and oral health. Encourage stress reduction techniques, such as exercise, meditation, and seeking support from friends, family, or professionals, to minimize the impact of stress on oral health.

Fluoride Use

Promote the use of fluoride toothpaste and mouthwash to strengthen tooth enamel and prevent tooth decay. Encourage individuals to check the fluoride content in their drinking water and consider fluoride supplements if necessary.

Vaccinations

Discuss the importance of vaccinations, such as the human papillomavirus (HPV) vaccine, in preventing oral infections that can lead to oral cancer.

Systemic Disease Management

Highlight the bidirectional relationship between oral health and systemic diseases. Encourage individuals with chronic conditions like diabetes or cardiovascular disease to manage their overall health effectively, as it can positively impact their oral health.

Commonly Outreach Programs

Support and participate in community initiatives that promote oral health education, free dental screenings, and access to affordable dental care. Collaborate with local healthcare providers, schools, and organizations to reach a wider audience.

Research and Innovation

Encourage ongoing research and innovation in the field of oral health and its connection to systemic diseases. Promote interdisciplinary collaborations between dental professionals, medical practitioners, and researchers to advance knowledge and develop effective preventive strategies.

CONCLUSIONS

It is crucial for individuals with chronic systemic diseases to prioritize their oral health in order to avoid worsening their symptoms. Therefore, effectively managing any existing oral infections is highly important and serves as a necessary measure to prevent complications that may affect the entire body.

Healthcare experts are consistently discovering more evidence that supports the connections between oral and

systemic health. Consequently, enhancing oral health could have significant implications for the overall well-being of the body, the prevention of diseases, and ultimately, for society and the quality of life of individuals.

Many developing countries do not prioritize oral health in their health policies, but now is the opportune moment to include overlooked oral diseases in global initiatives aimed eradicating other diseases like malaria, tuberculosis, AIDS, and malnutrition.

REFERENCES

1. Evanthia Lalla et al." Diabetes Mellitus and Periodontitis : A Tale of two common Interrelated Diseases." Nat Rev Endocrinol.2011 Jun28;7(12):738-48. doi:10.1038/nrendo.2011.106. PMID:21709707
2. Shaline King et al." Oral Gealth and Cardiometabolic disease : Understanding the Relationship."Intern Med. J.2022 Feb;52(2):198-205 doi: 10.1111/imj.15685. PMID:35187824
3. Vanchit John et al. "Periodontal Disease and Systemic Diseases : An Update for the Clinician." J Indiana Dent Assoc. 2016 Winter;95(1):16-23 PMID:26939411
4. Nicole B Arweiler et al." The Oral Microbiota." Adv Ex Med Biol.2016;902:45-60. doi:10.1007/978-3-319-31248-4_4. PMID:27161350
5. Edgar Francisco Carizales-Sepulveda et al." Periodontal Disease, Systemic Unflammation and the Risk of Cardiovascular Disease." Heart Lung Circ.2018 Nov;27(11):1327-1334. doi:10.1016/j.hlc.2018.05.102. Epub2018 Jun2. PMID:29903685
6. Gert Jungbauer et al. "Periodontal Microorganisms and Alzheimer's Disease -A Causative Relationship?" Periodontol2000.2022 Jun; 89(1);59-82 doi:10.1111/prd.12429. Epub2022 Mar4. PMID:35244967. PMCID:PMC9314828
7. Dominique S Michaud et al. "Periodontal disease, Tooth loss, and Cancer risk." Epidemiol Rev. 2017 Jan 139(1):49-58. doi:10.1093/epirev/mxx006. PMID:28449041. PMCID:PMC5868279
8. Tomohisa Nakamura et al. "Oral Dysfunctions and Cognitive Impairment/Dementia." J Neurosci Res. 2021 Feb;99(2):518-528. doi:10.1002/jnr.24745. Epub2020 Nov 8. PMID:33164225
9. Rita Pinto et al. " Periodontology and Hypertension: Is the Association Causal?" High Blood Press. Cardiovasc Prev. 2020 Aug;27(4):281-289. doi:10.1007/s40292-020-00392-z. Epub2020Jun4.
10. Yamashita Y, et al. "The Oral Microbiome and Human Health' J Oral Sci. 2017; 59(2):201-206. doi:10.2334/josnusd.16-0856. PMID;28637979
11. Lee M Sedghi et al. "Periodontal Disease: The Good, The Bad, and The Unknown. " Front Infect Microbiol.2021 Dec 7; 11:766944. eCollection2021. PMID: 34950607. PMCID:PMC8688827
12. Yvonne L Kapilla. "Oral health's inextricable connection to systemic health: special populations bring to bear multimodel relationships and factors connecting periodontal disease to systemic diseases." Periodontol 2000.2021 Oct;87(1):11-16. doi:10.1111/prd.12398. PMID:34463994. PMCID: PMC845713
13. Hai H Hawardi et al. "Current Understanding of the relationship between Periodontal and Systemic Diseases." Saudi Med J .2015 Feb;36(2):150-8. doi:10.15537/smj 2015.2.9424. PMID:25719577 PMCID:PMC4375690.
14. Wenxue Hou et al. "Recent progress and perspectives on the relationship between hyperuricemia and periodontitis." Front Immunol.2022.Nov 16; 13-995582. doi:10.3389/fimmu.2022.995582. eCollection2022. PMID:36466813. PMCID:PMC9708725
15. Esther Carramolino-Cuellar et al. "Relationship between the oral cavity and Cardiovascular diseases and metbolic syndrome." Med Oral Patol Oral Cir Bucal.2014 May 1;19(3) : e289-94. doi,:10.4314/medoral.19563. PMID:24121926. PMCID: PMC4048119
16. Ryutaro Kuraji et al. "Periodontal Disease-related nonalcoholic steatohepatitis : An emerging concept of oral-liver axis " Periodontol 2000.2021 Oct;87(1):204-240. doi:10.1111/prd.12387. PMID: 34463983. PMCID: PMC8456799
17. Feng Meu et al. "Pophyromonas gingivalis and its systemic Impact: Current Status." Pathogens.2020. Nov13; 9(11):944. doi:10.3390/pathogens 9110944. PMID: 33202751. PMCID: PMC7696708
18. Wong Y et al. Vvv Zord "Oral and General health: An inseparable pain " J Biol Regul Homeost Agent.2021 Jan-Feb;35(1Suppl.1), 55-63. PMID: 33463143
19. Vijendra P Singh et al." Oral health and Erectile Dysfunction " J Hum Repro Sci.2017.Jul-Seo;10(3):162-16. doi:10.4103/jhrs.JHRS_87_17. PMID:29142443. PMCID:PMC5672720
20. Carlos M Moreno et al. "Immunomodulatory role of Oral Microbiota in inflammatory diseases and Allergic conditions." Front Allergy 2023.Feb17;4:1067483. doi:10.3389/falgy.2023.1067483. eCollection2023. PMID:36873050. PMCID:PMC998179
21. LZ Touyz. "Oral Malodor - A Review". J Can Dent Assoc. 1993 Jul;59(7):607-10. PMID:8334555
22. Mikaela Brock et al. "The Relationship Among Periodontitis, Pneumonia and COVID-19." Front Oral Health.2023 Jan22;2:801815. doi:10.3389/froh.2021.801815. eCollection 2021. PMID:35128525. PMCID:PMC8813972

23. Paige M Bracci. "Oral Health and the Oral Microbiome in Pancreatic Cancer: An Overview of Epidemiological Studies." Cancer J. 2017 Nov/Dec; 23(6): 310-314. doi:10.1097/PPO.0000000000000287. PMID:29189325

24. Joan Otomo-Corgel et al. "State of the Science : Chronic Periodontitis and Systemic Health". J Evid Based Dent Pract.2012 Sep;13(3 Suppl):20-8. doi:10.1016/s1532-3382(12)70006-4. PMID:23040337

25. P S Casamassimo. "Relationship between Oral and Systemic Health" Pediatr Clin North Am.2000 Oct;47(5):1149-57. doi: 10.1016/s0031-3955105170261-3. PMID:11059353

26. Viviana Pitones-Rubio et al. "Is Periodontal Disease a risk factor for severe COVID-19 illness? " Med Hypotheses.2020 Nov;144:109969. doi:10.1016/jnehy.2020.109969. Epub2020 Jun19. PMID:32592918. PMCID:PMC7303044

27. Sabrina Akl et al. " A Systematic Review investigating patient Knowledge and Awareness on the association between Oral health and their Systemic condition." BMC Public Health 2021 Nov.12; 21(1):2077. doi:10.1186/s12889-021-12016-9. PMID:34772370. PMCID:PMC8590282

28. G W Pla. "Oral Health and Nutrition." Prim Care. 1994 Mar;21(1):121-33. PMID:8197250

29. Mary S Haumschild et al. "The Importance of Oral Health in long-term Care." J Am Med Div. Assoc.2009. Nov;10(9):667-71. doi:10.1016/j.jamda.2009.01.002. Epub2009 Jun28. PMID: 19883892

30. Mohammed Adam. "Obesity as a Risk factor for Periodontitis --- does it really matter? " Mmkkk BasedDent. Evid 2023Jun;24(2):48-49. doi:10.1038/s41432-023. PMID: 37130921

Citation: Prof. Dr. Willie Sai Ho Chan, "The Role of Oral Health in the Prevention of Systemic Diseases", Universal Library of Medical and Health Sciences, 2023; 1(1): 32-40. DOI: https://doi.org/10.70315/uloap.ulmhs.2023.0101005.