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The Relationship Between General Health and Periodontal Diseases

▷ **Abstract.** With the increasing number of facts confirming the impact of inflammatory oral diseases, such as gingivitis and periodontitis, on various systemic disorders, it has become necessary to draw the attention of practicing physicians to the effects of oral health on the body's overall health. This highlights the need for deeper interaction and coordination between general medical and dental professionals.

Keywords: *oral diseases, dental health, systemic diseases, focal infection theory, periodontitis, pregnancy, diabetes mellitus, cardiovascular diseases.*

It was once believed that oral diseases caused almost every inflammation in the body. At that time, treating systemic diseases often involved dental treatment or, most commonly, tooth extraction. Later, the relationship between general and dental health was ignored for some time. At the end of the last century, the focal infection theory again drew attention to the link between oral and systemic diseases.

According to this theory, an infection in one part of the body can affect other organs. Over the past two decades, significant progress has been made in studying the connection between periodontal diseases and overall human health. Research has mainly focused on identifying the mechanisms of interaction and the potential positive effects of periodontal treatment on the body's general condition.

It is often recognized that this relationship between general and dental health can be bidirectional; a good illustration of this complex issue is periodontitis in diabetes mellitus. Microbial dental plaque is the primary etiological factor of periodontal diseases, and the severity, progression rate, and prognosis of periodontitis depend on the body's immune defense. Risk factors such as poor nutrition, bad habits, stress, chronic diseases, and an unfavorable environmental situation affect the entire body, reducing immune and anti-inflammatory protection. In the presence of inflammatory periodontal diseases, the oral cavity serves as a reservoir for microorganisms, increasing the risk of infection and complications in other organs and systems.

Currently, researchers' main task is to determine whether the simultaneous occurrence of diseases in microorganisms and the oral cavity is a coincidence of risk factors or a true cause-and-effect relationship.

At present, clinical research data already confirms that periodontal infections can influence pregnancy, diabetes mellitus, and cardiovascular diseases, and there is also a reverse relationship. Pulmonary diseases may also be associated with periodontal diseases. The periodontal syndrome—what comes first…

Pregnancy

Scientific publications show that hormonal changes during puberty, pregnancy preparation, pregnancy, and menopause alter the body's responses and affect all organs and systems, including periodontal tissues.

In inflammatory periodontal diseases, the level of inflammatory mediators and prostaglandins increases.

It is known that some of these substances, such as prostaglandin E2 (PGE2), affect the likelihood of preterm birth. Thus, it can be assumed that pregnant women with periodontal diseases have a higher risk of preterm birth than healthy women.

Additionally, inflammatory processes in other organs, tissues, and maternal infections play a certain role.

Inflammatory periodontal diseases increase the risk of the following complications:

- membrane rupture;
- preterm birth;
- miscarriage;

• deterioration of newborn health, fetal nervous system damage.

While a causal relationship between these facts has not yet been proven, women should maintain oral and periodontal health, especially during pregnancy.

Diabetes Mellitus

Diabetes mellitus is the most common metabolic disorder caused by insufficient insulin production or cellular receptor insensitivity to insulin, leading to high blood glucose levels.

Periodontal diseases are now called the sixth complication of diabetes mellitus, along with retinopathy, nephropathy, neuropathy, macrovascular complications, and poor wound healing. Collagen formation is impaired, leading to diabetic osteopathy, including osteopenia, osteoporosis, and calcium metabolism disorders.

Thus, diabetes is considered a factor contributing to developing periodontal diseases. Certain biological mechanisms explain the relationship between diabetes and periodontal tissue condition. These include microangiopathy, genetic factors, changes in gingival fluid, collagen metabolism, inflammatory response, and changes in subgingival flora. On the other hand, bone metabolism in diabetes mellitus is characterized by decreased osteoblast function, preventing bone formation from compensating for normal or increased bone resorption. In turn, inflammation in periodontal tissues can negatively affect blood sugar control. Thus, effective antibacterial treatment of periodontitis can reduce glycated hemoglobin levels in diabetic patients and decrease the risk of complications.

Undoubtedly, further research is needed to reveal more precise mechanisms of mutual influence.

Cardiovascular Diseases

Cardiovascular diseases are the leading cause of death in many countries. However, up to 50% of cardiovascular disease patients do not have any traditional risk factors.

People with severe chronic periodontitis have an increased risk of developing cardiovascular diseases, alongside traditional risk factors such as age, male gender, diabetes mellitus, smoking, and hereditary predisposition. It is now confirmed that infection and chronic inflammation, including inflammatory periodontal diseases, play an important role in the onset and progression of atherosclerosis.

Cardiovascular diseases and periodontal diseases share several common features. Both conditions are more common in middle-aged men who smoke, suffer from hypertension, and experience stress.

This suggests that periodontal and cardiovascular diseases may also have similar causes.

The formation of microbial biofilm leads to periodontal inflammation and, subsequently, potential loss of tooth attachment. Dental plaque in the periodontal pocket “fuels” the local inflammatory process and sustains cytokine production by macro-organism cells. Moreover, dental plaque bacteria can directly cause bacteremia. It is known that bacteremia and endotoxinemia in periodontitis lead to increased levels of pro-inflammatory cytokines in the blood serum, such as IL-1β, IL-6, and TNF-alpha, which stimulate acute-phase protein release and cause lipid metabolism changes. These cytokines are also known to induce insulin resistance. Bacterial components and immune-inflammatory reaction products can directly or indirectly lead to developing or worsening a systemic inflammatory response, causing atherosclerosis.

Respiratory Diseases

Since the oral cavity is in close proximity to the respiratory tract, it serves as a reservoir for respiratory pathogens. Chronic infection sites in the oral cavity, localized in periodontal tissues, can allow pathogens to enter the lower respiratory tract, increasing the risk of respiratory and ENT infections. Therefore, periodontal disease treatment may reduce the number of these pathogens residing on tooth surfaces and oral tissues.

Oral health is part of overall human health, so integrating general medicine and dentistry should be encouraged. Periodontal diseases are chronic infections that trigger local and systemic immune-inflammatory responses and serve as a source of bacteremia. Thus, preventing and treating periodontal diseases reduces the risk of developing systemic chronic diseases. If further research confirms that periodontal diseases are a true risk factor for systemic diseases, new prospects will emerge in dentistry.

Conclusion

Given the above, periodontal disease prevention and timely treatment are essential for preventing the formation of chronic infection sites in the oral cavity and maintaining overall somatic health.

REFERENCES

1. M. A. Kurmanalina, R. M. Uraz. Relationship Between Inflammatory Periodontal Diseases and General Somatic Pathology. *Medical Journal of Western Kazakhstan*, 2015; 3(47): 19–24. URL: http://zkgmu.kz/docs/journal/3.47.2015.pdf

2. Danilevsky, N.F. Periodontal Diseases. N.F. Danilevsky, E.A. Magid, N.A. Mukhin. M.: Medicine, 1999; p.102–103.
3. Kravchuk I.V., Danilova D.V. Oral Health in Patients with Chronic Renal Failure. *Ukrainian Dental Almanac* 2013; 5:98–99.
4. Rizaev J. A., Khusanbaeva F. A., Kubaev A. S. Manifestations of Chronic Kidney Disease. *Doctor's Bulletin*, 2021. No. 4.
5. Wang Y.L., Liou J.D., Pan W.L. Association Between Maternal Periodontal Disease and Preterm Delivery and Low Birth Weight. *Taiwan J Obstet Gynecol*, 2013; 52(1):71–76. PMID: 23548222. DOI: https://doi.org/10.1016/j.tjog.2013.01.011
6. Costa de Figueiredo, Neto de Oliveira, Lopes e Maia de Almeida. Association between Chronic Apical Periodontitis and Coronary Artery Disease. *J. Endod.* 2014; 40(2):164–170. PMID: 24461397. DOI: https://doi.org/10.1016/j.joen.2013.10.026.
7. Pieter van der Bijl Jr. Infective Endocarditis and Antibiotic Prophylaxis—An Update for South African Dental Practitioners. *SADJ* 2014; 69(3):118, 120-1. PMID: 24974482.
8. Charo F, Taub. Anti-Inflammatory Therapeutics for the Treatment of Atherosclerosis. *Nat Rev Drug Discov* 2011; 10(5): 365–376. PMID: 21532566. DOI: https://doi.org/10.1038/nrd3444.
9. Fisher M, Borgnakke WS, Taylor GW. Periodontal Disease as a Risk Marker in Coronary Heart Disease and Chronic Kidney Disease. *Curr Opin Nephrol Hypertens* 2010; 9(6):519–526. PMID: 20948377. DOI: https://doi.org/10.1097/MNH.0b013e32833eda38.
10. I. Niedzielska, T. Janic, S. Cierpka, E. Swietochowska.The Effect of Chronic Periodontitis on the Development of Atherosclerosis: Review of the Literature. *Med Sci Monit*, 2008; 14(7): RA103-106. PMID: 18591928.
11. Kim Y.J., de Moura L.M., Caldas C.P. et al. Evaluation of Periodontal Condition and Risk in Patients with Chronic Kidney Disease on Hemodialysis. Einstein (Sao Paulo).2017; 15(2): 173–177. PMID: 28767915. DOI: https://doi.org/10.1590/S1679-45082017AO3867.

Зв'язок між загальним станом здоров'я та захворюваннями пародонту

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Анотація. Зі збільшенням кількості фактів, що підтверджують вплив запальних захворювань ротової порожнини, таких як гінгівіт і пародонтит, на різні системні порушення, виникла необхідність привернути увагу практикуючого лікаря, до впливу здоров'я порожнини рота на загальний стан організму. Це підкреслює необхідність глибшої взаємодії та координації між медичними та стоматологічними фахівцями.

Ключові слова: захворювання порожнини рота, стоматологічне захворювання, системні захворювання, теорія осередкової інфекції, пародонтит, вагітність, цукровий діабет, серцево-судинні захворювання.

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