

ORAL MICROBIOTA: NORMAL AND PATHOGENIC MICROORGANISMS

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Annotation

This article highlights the composition of the oral cavity microflora and the role of normal and pathogenic microorganisms. Normal microflora plays an important role in protecting the oral mucosa, maintaining pH balance, and initiating digestion. Pathogenic microorganisms, however, can multiply when hygiene is neglected or immunity decreases, potentially causing diseases such as caries and stomatitis.

Keywords

Oral microflora, normal microflora, pathogenic microorganisms, caries.

Introduction

The oral cavity microbiota plays an essential biological role in the human body. Healthy microbiota contributes to strengthening the immune system, digesting nutrients, protecting the oral mucosa, and preventing oral diseases. Dysbiosis of the microbiota not only leads to the development of dental diseases—such as caries, periodontitis, and gingivitis—but also negatively affects overall health. Recent studies indicate that changes in the oral microbiota are associated with cardiovascular diseases, diabetes, atherosclerosis, respiratory diseases, and immune system disorders. Therefore, monitoring and maintaining the oral microbiota is of strategic importance for preserving general health.

Several preventive measures are used to maintain a balanced oral microbiota: proper oral hygiene, the use of probiotics, regular dental check-ups, and dietary control. In addition, modern technologies, including genetic diagnostics, microbiome analysis, and laser-based methods, allow for highly accurate assessment of the oral microbiota.

It has been confirmed by numerous scientific studies that the oral microbiota has not only local but also systemic effects on the human body. Therefore, monitoring the state of the oral microbiota and taking care of it is an urgent task in both dentistry and general medicine.

Main Body

1. Oral Microbiota and Its Composition

The oral cavity contains hundreds of microorganisms. Bacteria, fungi, and viruses are all



part of the normal microbiota. Healthy microbiota controls pathogenic microorganisms, stimulates the immune system, and participates in the digestion of nutrients.

2. **Dysbiosis and Its Consequences**

Imbalance of the microbiota can lead to dental diseases such as caries, periodontitis, and gingivitis. In addition, dysbiosis can contribute to cardiovascular diseases, diabetes, respiratory infections, and immune system disorders. Research indicates that changes in the oral microbiota also affect other body systems.

3. **Preventive Measures**

Proper oral hygiene, the use of probiotics, and regular dental check-ups help maintain microbiota balance. Dietary control, such as reducing sugar and acid intake, also supports a healthy oral microbial composition.

4. **Modern Diagnostic Methods**

Genetic diagnostics and microbiome analysis provide high accuracy in detecting changes in the oral microbiota. Laser and digital technologies enable rapid detection of microbial changes on tooth surfaces and help in planning preventive measures.

5. **Impact on Systemic Health**

Dysbiosis of the oral microbiota can contribute to cardiovascular diseases, atherosclerosis, diabetes, respiratory infections, and immune system disorders. Therefore, maintaining and monitoring the oral microbiota is crucial for supporting overall health.

6. **Clinical Research and Scientific Studies**

Recent scientific studies show that maintaining a healthy oral microbiota reduces not only dental diseases but also the development of systemic diseases. The use of probiotics and regular dental check-ups ensures the health of the oral microbiota.

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Recommendations: Conduct regular monitoring of the oral microbiota. Promote the use of probiotics and hygiene measures in both pediatric and adult dentistry. Implement modern diagnostic methods, including genetic analysis, microbiome profiling, and laser technology. Support the microbiota through diet and nutritional control. Strengthen collaboration between healthcare providers and dental professionals.

Normal and Pathogenic Microorganisms

The main difference between normal (or resident) and pathogenic microorganisms lies in their effects on the host organism (human, animal, or plant).

Normal Microorganisms (Normal Microbiota)

Normal microorganisms are a natural part of the human body and do not cause disease. On the contrary, they perform a number of beneficial functions.

1. Normal gut flora aids in the digestive process and synthesizes essential nutrients, such as B-group vitamins.

2. **Immune Development:**

In newborns, they stimulate the development of the immune system.

3. **Location:**

They are primarily found on the skin, in the oral cavity, intestines, respiratory tract, and parts of the urogenital system.

Normal microorganisms can cause problems if the immune system is weakened or if they enter parts of the body that are normally sterile (for example, gut bacteria entering the abdominal cavity). In such cases, they are referred to as **opportunistic pathogens**.



Pathogenic Microorganisms

Pathogenic microorganisms (bacteria, viruses, fungi, protozoa, etc.) have the ability to cause disease in the host organism.

Harmful Effects:

1. **Invasion and Multiplication:**

They enter the body and multiply in specific tissues or organs.

2. **Damage:** They harm host cells by releasing toxins and disrupt normal cellular functions.

3. **Immune Evasion:** They have developed mechanisms to evade or resist the host's immune responses.

Examples: *Salmonella* (salmonellosis), *Vibrio cholerae* (cholera), *Mycobacterium tuberculosis* (tuberculosis), Influenza virus (flu) and others

Conclusion

The oral microbiota is an important biological system for human health, and its composition is determined by the balance between normal and pathogenic microorganisms. Normal microbiota plays a critical role in protecting the oral mucosa, maintaining pH balance, limiting the growth of pathogenic microbes, and initiating the digestive process. However, when hygiene rules are neglected or the immune system is weakened, pathogenic microorganisms can proliferate actively, leading to caries, stomatitis, and other inflammatory diseases.

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