JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 10, October 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

MODERN TREATMENT FOR CHILDHOOD DENTAL CARIES

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Abstract: This article analyzes the causes of dental caries, a common oral cavity disease in children, its development mechanism, and modern treatment methods. The study examines the key factors influencing the development of caries, including dietary habits, oral hygiene, microbiome changes, and genetic factors. The article also provides detailed information on preventive measures, the importance of improving hygiene culture, and strategies for maintaining dental health in children. New treatment methods, including laser therapy, remineralization, composite material fillings, and other innovative technologies, are discussed, highlighting their advantages. These approaches are not only important in treating caries but also in preserving the healthy structure of the teeth. The research emphasizes the importance of early detection of dental caries in children and provides recommendations to improve the effectiveness of its prevention and treatment. Modern approaches and methods focused on maintaining healthy tooth structure are also particularly emphasized.

Keywords: Pediatric dentistry, caries (tooth decay), modern treatment, prevention, remineralization, laser therapy, composite fillings.

One of the most common dental issues faced by children today is dental caries (tooth decay). According to the World Health Organization (WHO), between 60% and 90% of preschool-aged children experience some form of dental caries. This high incidence is closely linked to various factors such as dietary habits, personal hygiene practices, and the inherent strength of tooth enamel. A poor diet high in sugars, combined with inadequate brushing habits, significantly increases the risk of caries. In addition, children with weaker enamel or those who do not receive fluoride treatment may be more susceptible to developing cavities. Tooth decay is a progressive, infectious condition where the hard tissues of the tooth, namely the enamel and dentin, break down due to the action of bacteria that feed on sugars. This process leads to the formation of cavities, which can cause pain, infection, and, in severe cases, tooth loss. Early detection and intervention are crucial, as untreated caries can lead to long-term oral health problems, including the need for more invasive treatments such as root canal therapy or even tooth extraction. In the past, treating dental caries in children often involved drilling and filling cavities using traditional methods. However, in recent years, there has been a significant shift toward minimally invasive treatments that aim to preserve the tooth structure as much as possible. These methods not only help retain more of the natural tooth but also reduce discomfort, recovery time, and the need for extensive dental procedures later on.

Modern technologies and treatment methods in pediatric dentistry have revolutionized the way dental caries is managed. Laser therapy, for instance, uses focused light energy to remove decayed tissue with minimal discomfort and without the need for traditional drills. This approach significantly reduces pain and anxiety in children, making dental visits more pleasant and less stressful. Laser treatment can also aid in disinfecting the cavity area, promoting faster healing

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and reducing the risk of further infection. Another important advancement is the use of high-quality composite fillings. These fillings are made from a durable, tooth-colored material that not only provides a more aesthetically pleasing result but also bonds strongly with the tooth structure. Composite materials are especially advantageous for treating cavities in children's front teeth, where appearance is important. Moreover, these fillings expand and contract at a similar rate to the natural tooth, reducing the risk of cracks or fractures over time. Remineralization therapy is another key modern treatment for caries, particularly in the early stages before cavities form. This process involves the application of fluoride or calcium-based treatments that help restore lost minerals in the enamel, strengthening it and potentially reversing minor decay. Remineralization can be done through professional treatments at the dentist's office, or with fluoride varnishes and toothpaste at home. This technique is ideal for managing initial decay before it progresses into more serious cavities, thus avoiding more invasive interventions.

In addition to these technological advancements, a strong focus on prevention has become central to pediatric dentistry. Preventive strategies such as fluoride treatments, dental sealants, and regular professional cleanings are crucial in reducing the incidence of dental caries in children. Teaching children the importance of brushing and flossing their teeth from a young age and encouraging a balanced, low-sugar diet can go a long way in maintaining healthy teeth. Public health efforts to improve oral hygiene education are also important. By raising awareness about the significance of oral health and promoting good dental habits, it is possible to reduce the overall burden of dental caries in the pediatric population. Many countries have implemented school-based programs that emphasize proper tooth brushing techniques and the need for regular dental check-ups.

Ultimately, the development and integration of these modern treatments and preventive strategies have transformed the field of pediatric dentistry. Today, children with dental caries can receive more effective, less painful, and more aesthetically pleasing treatments than ever before. However, the challenge remains to continue improving access to these treatments, particularly in underserved communities, and to instill good dental hygiene practices in children and their families at an early age. Dental caries in children is a common dental problem that involves a process of infection and degeneration, which damages the hard tissues of the teeth. If left untreated, it can spread to deeper tissues, leading to serious complications. According to the World Health Organization, around 60–90% of preschool-age children experience varying degrees of caries. Several factors contribute to the development of this disease, including poor diet, inadequate oral hygiene, congenital weakness of tooth enamel, fluoride deficiency, and genetic predisposition.

The development of caries typically begins with the frequent consumption of sugary and sticky foods. Carbohydrates left in the mouth are broken down by bacteria, which produces acids. These acids then erode the mineral content of the tooth enamel, initially forming white spots and later small cavities. If not treated in time, this process can spread to the dentin and pulp, damaging the internal structures of the tooth. Children's tooth enamel is softer and contains fewer minerals compared to that of adults, making caries progress faster. Therefore, early detection and

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modern treatment of caries in children is one of the most important tasks for dentists. In modern dentistry, several new approaches have been developed for the treatment of dental caries.

One of the key principles in contemporary dental care is **minimal invasive treatment**. This approach aims to preserve as much of the natural tooth structure as possible by removing only the affected tissues. The goal is to maintain the strength of the tooth, making the treatment process painless and comfortable for the patient

One of the most effective methods used today is **laser therapy**. Laser technology allows for the precise and painless removal of decayed tissue. This is especially beneficial for children, as it reduces their fear of dental procedures. Furthermore, the bactericidal effect of lasers significantly reduces the risk of infection within the tooth cavity. Lasers can also aid in sterilizing the area, preventing further complications during the treatment.

Another important advancement in caries treatment is **remineralization therapy**, which plays a critical role in the early stages of tooth decay. This approach helps to restore the tooth enamel by replenishing lost minerals, particularly calcium and phosphorus. Special remineralizing products help to reduce white spots on the tooth surface, strengthen enamel, and prevent the progression of caries. This technique is particularly useful in young children, as it can restore the tooth's natural structure without the need for invasive surgical intervention.

In the field of **fillings** and **restorative materials**, there have been significant advancements as well. In the past, metal or amalgam fillings were commonly used. Today, **composite materials** that match the natural color of the tooth are now the preferred option. These composite fillings bond securely with the tooth, are durable, and provide a natural appearance, blending seamlessly with the surrounding tooth structure. Moreover, composite fillings often contain fluoride ions, which help strengthen the tooth enamel and prevent the formation of new caries.

Furthermore, **nano-composite materials** are becoming increasingly popular in dental restorations. These materials offer enhanced durability and are highly adaptable to the tooth structure, ensuring a precise fit and long-lasting result.

Other advancements include digital technologies like 3D scanning and computer-aided design (CAD) for more accurate diagnostics, treatment planning, and the creation of crowns, bridges, and implants. This technology enhances the precision and efficiency of restorative procedures, allowing for faster and more comfortable treatments for patients.

In summary, modern dentistry focuses on preserving the natural tooth structure, minimizing pain and discomfort during treatment, and using advanced technologies to achieve more durable, aesthetically pleasing results. These innovations contribute to improving both the functional and aesthetic outcomes of dental care. Preventive measures are crucial in reducing the occurrence of dental caries in children. Teaching children proper brushing techniques, controlling the consumption of sugary products, and maintaining regular use of fluoride toothpaste are effective

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strategies for preventing the development of caries. Regular dental check-ups enable early detection and treatment of caries, which is especially important for preschool-aged children, who should be seen by a dentist at least twice a year.

Increasing parental awareness of oral hygiene is also an integral part of the preventive process. Parents should begin cleaning their child's teeth with a soft toothbrush as soon as the first tooth erupts. Limiting the consumption of sweets, sugary drinks, carbonated beverages, and acidic foods that can damage tooth enamel is essential for maintaining healthy teeth. Furthermore, it is crucial for pregnant women to maintain a healthy diet, ensuring adequate intake of vitamins and minerals, as it significantly contributes to the proper development of the child's teeth.

In modern dentistry, one of the innovative methods used in the treatment of dental caries is ozone therapy. Ozone, with its strong antibacterial properties, effectively eliminates harmful microorganisms in the tooth cavity, accelerating the healing process. This method is painless, quick, and highly suitable for use in children. Moreover, ozone therapy reduces the risk of post-treatment complications and preserves the natural structure of the tooth.

During treatment, dentists follow an individualized approach, considering factors such as the degree of tooth damage, the child's age, and their overall health. This personalized treatment plan not only improves the effectiveness of the procedure but also eases the child's emotional well-being. Additionally, regular communication with parents, providing guidance on maintaining oral hygiene at home, and offering advice on best practices for oral care are critical components of effective treatment and prevention.

Preventive measures play a pivotal role in minimizing the prevalence of dental caries in children. Effective prevention strategies, such as educating children on proper oral hygiene practices, limiting sugary food and beverage consumption, and regularly using fluoride toothpaste, have proven to be instrumental in preventing caries development. Additionally, regular dental check-ups, particularly for preschool children, allow for the early detection and management of dental issues, improving long-term oral health outcomes. The involvement of parents in enhancing their awareness of oral hygiene is equally crucial. Early intervention, such as cleaning an infant's teeth with soft brushes, and reducing exposure to foods that can harm tooth enamel, are essential for establishing healthy dental habits from a young age. Moreover, maternal nutrition during pregnancy plays a significant role in the proper formation of the child's teeth, highlighting the need for adequate vitamin and mineral intake. Innovative treatments, such as ozone therapy, represent an important advancement in caries management. The use of ozone's antibacterial properties to eliminate harmful bacteria in the tooth cavity accelerates the healing process, reduces the likelihood of complications, and preserves the natural tooth structure, making it an ideal option for pediatric dental care. In summary, a holistic and individualized approach, considering the child's age, the severity of the caries, and their overall health, ensures a more effective treatment plan. Combining early prevention, modern treatment technologies, and parental education significantly enhances the likelihood of achieving optimal oral health for children. Regular communication with parents and guidance on maintaining proper hygiene at

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home further contribute to long-term success in preventing dental diseases.

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