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ORAL HEALTH IN DOWN'S SYNDROME PATIENTS

Dental Science

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KEYWORDS

INTRODUCTION-

Providing oral care to individuals with Down syndrome necessitates adjusting the techniques typically employed. Many individuals with mild to moderate Down syndrome can receive effective treatment within general dental practice settings. This guide aims to empower you to positively impact the lives of those requiring professional oral care. Down syndrome, a prevalent genetic condition, varies in its severity and often accompanies medical and physical challenges. These may include cardiac issues, susceptibility to infections, muscle weakness (hypotonia), and hearing impairment. Furthermore, the majority of individuals with Down syndrome experience mild to moderate cognitive impairment, with a smaller proportion facing severe challenges. Developmental delays, particularly in speech and language, are commonly observed in this population. [1]

Down syndrome (DS) is the most common neurodevelopmental disorder of known genetic cause, with an incidence of between 1:750 and 1:1000 live births. DS has usually been described simply as arising from an extra copy of chromosome 21. [2]

Down syndrome presents with specific physical, cognitive, and medical characteristics. Some of these traits, including cognitive impairments, heart abnormalities, and immune system alterations, significantly impact oral health and the provision of dental care. Within Down syndrome, systemic issues, such as compromised immune function, increase the susceptibility to oral infections, which can exacerbate other systemic conditions.[3]

The typical development of oral structures is disrupted in individuals with Down syndrome, resulting in reduced tooth size, altered crown shapes, delayed eruption, and hypodontia. This alteration in oral structure impairs various functions including suckling, swallowing, chewing, mastication, and can lead to difficulties in speech. Additionally, systemic issues such as immunological deficiencies in individuals with Down syndrome may predispose them to oral diseases and disorders, which in turn can exacerbate systemic conditions. [4]

In Down syndrome, periodontal disease poses a significantly more common and serious issue compared to dental caries, with studies indicating its prevalence in as many as 90% of this specific population.
The scientific data regarding the vulnerability to dental caries among individuals with Down syndrome is scarce and presents conflicting results, thus posing challenges in drawing definitive conclusions.

Oral Health Problems in Down Syndrome

Individuals with Down syndrome do not exhibit distinctive oral health issues. Nevertheless, some of the challenges they encounter tend to be both common and severe. Early intervention by dental professionals along with regular home care can alleviate their severity, enabling individuals with Down syndrome to experience the advantages of good oral health.

Periodontal disease

Individuals with Down syndrome (DS) face heightened susceptibility to periodontal disease, a condition characterized by inflammation and damage to the structures supporting the teeth. This increased vulnerability stems from various factors unique to DS, including altered immune function, genetic predispositions, and structural abnormalities in oral tissues. Studies suggest that periodontal disease is considerably more prevalent and severe in individuals with DS compared to the general population, with some research indicating rates as high as 90%. [1,5]

Moreover, individuals with DS often experience challenges in oral hygiene maintenance due to factors such as manual dexterity limitations and cognitive impairments. These difficulties can further exacerbate the risk of periodontal disease development and progression.

Early diagnosis and comprehensive periodontal care tailored to the specific needs of individuals with DS are crucial for managing periodontal health effectively. Regular dental visits, preventive measures, and patient education are essential components in mitigating the impact of periodontal disease in this population.[6]

Dental caries

Individuals with Down syndrome (DS) face unique challenges regarding dental caries, commonly known as tooth decay. Research suggests that while the prevalence of dental caries in individuals with DS may not significantly differ from the general population, the severity and progression of caries tend to be more pronounced in this group. Contributing factors include structural abnormalities in tooth enamel, reduced salivary flow, dietary habits, and difficulties in oral hygiene maintenance due to cognitive and motor impairments. [7]

Furthermore, individuals with DS often have a higher intake of fermentable carbohydrates and are more prone to xerostomia (dry mouth), which can exacerbate the risk of dental caries development.

Early preventive measures, including regular dental check-ups, fluoride treatments, dietary counseling, and assistance with oral hygiene practices, are essential in managing dental caries in individuals with DS effectively. [8]

Orofacial features

Maxilla-

The maxilla, nasal bridge, and midface bones are typically smaller in individuals with Down syndrome compared to the general population, resulting in a prognathic occlusal relationship. Due to smaller nasal passages, mouth breathing can occur, and the tongue may protrude more prominently because of the reduced midface region. Individuals with Down syndrome commonly exhibit a heightened gag reflex due to tongue placement and may experience anxiety related to any oral stimulation. [9,10]

Palate-

The hard palate may seem excessively arched and narrow. This misleading appearance is attributed to the atypical thickness of the sides of the hard palate. This thickness limits the space available for the tongue within the oral cavity, impacting speech and chewing abilities. [11]

Lips-

The lips may become enlarged and thickened over time. Chronic mouth breathing can lead to the development of fissures in the lips. Moreover, hypotonia may cause the mouth to droop, resulting in the protrusion of the lower lip. Excessive drooling, particularly in combination with a consistently open mouth, can exacerbate angular cheilitis. [12]

Tongue-

As individuals age, the tongue may develop cracks and fissures, which can be a contributing factor to halitosis. [12]

Malocclusion

The majority of individuals with Down syndrome experience malocclusion due to delayed eruption of permanent teeth and underdeveloped maxilla. A smaller maxilla often results in an open

bite, causing improper alignment of teeth and raising the risk of periodontal disease and dental caries.[13]

Tooth anomalies

Individuals with Down syndrome experience *congenital absence of teeth* more frequently than the general population. The most commonly missing teeth in this group are the third molars, lateral incisors, and mandibular second premolars.

Anomalies in tooth development, including microdontia and malformed teeth, are common in individuals with Down syndrome. Crowns typically exhibit smaller sizes, while roots tend to be small and conical, increasing the risk of tooth loss due to periodontal disease. Severe illnesses or prolonged fevers may result in hypoplasia and hypocalcification.

Individuals with Trisomy 21 may also be associated with taurodontism.

Some children with Down syndrome experience *delayed eruption of teeth*, which may occur in an abnormal sequence. Primary teeth might not emerge until around the age of 2, and the full set of primary dentition may be delayed until the ages of 4 or 5. In some cases, primary teeth may persist until the ages of 14 or 15. [14]

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