



PERIODONTAL HEALTH RELATED CHALLENGES IN GERIATRIC AND PEDIATRIC PATIENTS

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Abstract:

Periodontal health is integral to overall well-being, with its definition encompassing the absence of inflammatory diseases that impair daily functioning. This article explores the challenges of maintaining periodontal health in two distinct yet significant populations: geriatric and pediatric patients. The geriatric population, projected to reach 347 million by 2050, faces unique issues including physiological changes, chronic health conditions, financial constraints, and psychological factors that complicate oral health management. Aging is often associated with decreased oral hygiene efficiency, reduced saliva production, and complex interactions with chronic diseases and medications, leading to a higher prevalence of periodontal diseases and tooth loss.

Conversely, pediatric patients, particularly those with special needs or disabilities, also encounter unique challenges. These include difficulties in maintaining oral hygiene due to physical or cognitive limitations, which can lead to early-onset periodontal issues if not addressed promptly. Conditions such as cerebral palsy, autism spectrum disorder, Down syndrome, and visual or hearing impairments create additional barriers to effective oral care. Caregiver education, specialized treatments, and tailored preventive strategies are crucial in managing the periodontal health of these children.

The article emphasizes the necessity of early diagnosis and intervention for both populations to prevent the progression of periodontal diseases. It highlights the importance of addressing the specific needs of geriatric and pediatric patients through targeted care and caregiver involvement. By understanding and addressing these unique needs, we can improve periodontal health outcomes and enhance the quality of life for individuals across the lifespan.

Keywords: *Periodontal Health, Geriatric Patients, Pediatric Patients, Special Needs, Oral Hygiene, Preventive Strategies, Age-Related Challenges*

Introduction

“Your smile is your logo. Your periodontal health is your business card, and how you maintain and take care of it for years becomes your trademark.”

Periodontal health, as defined by the WHO, is a condition in which the human mouth is free from any inflammatory periodontal disease that hinders an individual from performing their basic tasks due to the physical or mental effects of current or past diseases.(1) Assessing the condition of the periodontium involves considering factors such as probing depth, clinical attachment level, rate of bone loss, gingival recession, and gingival inflammation. One must question whether it is reasonable to assume that a healthy and disease-free periodontal tissue can ever be a reality or if further evidence is needed to consider periodontal health.

Theoretically, an ideal periodontium should be healthy and aseptic; if this is so, it means that everyone is a carrier of one disease or another. Cognitive and affective aspects of aging, social and cultural roles, and expectations are tightly connected with the development of chronic diseases that negatively influence the state of the periodontium.(2)



Representative images taken from internet sources

Objective

This essay addresses the challenges in maintaining periodontal health in special populations, particularly in geriatric and paediatric patients. Given the growing population, especially among the elderly due to advancements in healthcare facilities, and the predicted decline in the paediatric population by 2050, it becomes essential to consider the unique periodontal health needs of these groups.(2)

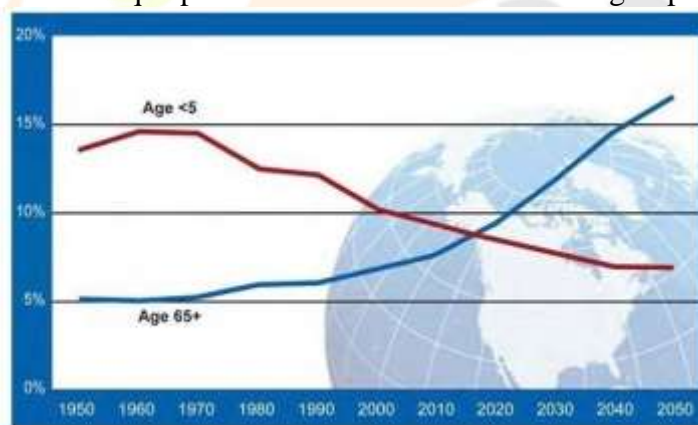


Fig 1: Line graph showing the expected geriatric and paediatric population by 2050.

Regarding oral hygiene, many individuals neglect their periodontal health and visit private clinics or dental hospitals when the condition becomes aggressive. Among them, the neglected population comprises both the paediatric and geriatric strata. Each group visits the periodontists only when the need arises, which is why they remain neglected after that.

The pie chart shown below indicates the percentage of patients who never went to a dental OPD versus patients who visited a dental OPD. (3)

S. Ghosal et al.

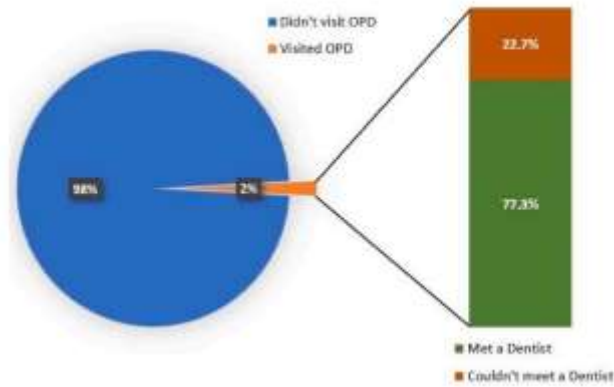


Fig 2: Pie Chart showing the population who visited the OPD Vs who did not

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Pic courtesy: Internet sources



Fig 3: Periodontal status of a geriatric patient

The geriatric population is projected to reach approximately 347 million by 2050. Periodontal diseases in older adults can be associated with the gingiva or arise from the destruction of the periodontium. (4) These diseases can develop at any age and generally progress slowly. Cognitive and affective aspects of aging, social and cultural roles, and expectations are tightly connected with the development of chronic diseases that negatively influence the state of the periodontium.

Dentistry in the present era is very much unlike what it used to be in the past. In this era of extreme sub-specialization, clinical competencies are honed harmoniously with professional knowledge. The periodontal diseases in old age people can be associated with the gingiva or may arise from the destruction of the

periodontium. Periodontitis has been of interest in many researches from the anatomical, epidemiological, clinical and cellular point of view. It can develop at any age and is generally a very slow progression. These are frequently seen in the initial years of puberty and if they do not receive treatment, degenerative periodontal diseases are bound to occur in the later stages of life. Therefore, periodontal issues should not be overlooked and should be treated to achieve a proper oral health status. History, clinical examination, correct categorization and the diagnostic strategy are essential for diagnosis.

The CDC has also pointed out that the deterioration of dental health during the later years is associated with a person's status in society. For instance, elderly individuals with poor hygiene of the oral cavity are those who are financially unstable and ethnic minorities without health insurance.



Pic courtesy: internet sources

Difficulties Accompanying Aging

1. **Physiological Issues:** Aging is accompanied by challenges such as decreased efficiency in cleaning or flossing teeth and reduced saliva production, leading to dryness of the mouth, decay, and tooth loss.
2. **Chronic Health Problems:** Elderly patients often have chronic medical conditions like cardiovascular diseases or diabetes and take medications that worsen oral health, such as xerostomia.
3. **Financial Issues:** Professional dental care is costly, and pensioners with limited income or no health insurance may struggle to afford necessary treatments.
4. **Psychological Factors:** Elderly individuals may feel they have no control over their health, leading to decay or gum diseases, and may develop anxiety about dental treatments.



Pic courtesy: internet sources

According to a systematic review conducted by Zhang et al., half of U.S. adults aged 20–64 years have lost at least one permanent tooth, and one in six adults aged 65 and over in the U.S. is edentulous. The primary cause of tooth loss is identified as periodontitis. Tooth loss and edentulism can interfere with nutritional intake and quality of life. (5)

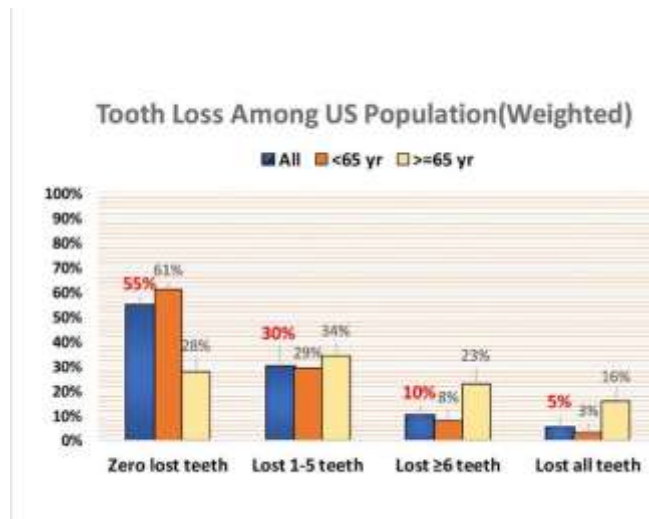


Fig 4: Distribution of Periodontal disease amongst the population

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Periodontal diseases in children can be associated with the gingiva or arise from the destruction of the periodontium. Early diagnosis and appropriate treatment are crucial, especially for children with special requirements. (6)



Pic courtesy: Internet sources



Fig 5: Periodontal status of pediatric patients

Management of Periodontal Problems in Paediatric Patients:

1. **Special Needs Children:** Periodontists play a crucial role in treating special needs children, addressing issues such as aggressive periodontitis, non-surgical management of incipient chronic periodontitis, and medical conditions complicating periodontal destruction.
2. **Children with Disabilities:** Conditions such as cerebral palsy, autism spectrum disorder (ASD), Down syndrome, and Ehlers-Danlos syndrome present unique oral health challenges. These children often have difficulty maintaining proper oral hygiene due to physical and cognitive limitations.
3. **Caregiver Education:** Educating caregivers about oral hygiene is essential for maintaining the oral health of special needs children. Children with conditions like cerebral palsy or Down syndrome require specialized care and preventive treatments to avoid periodontal tissue destruction.

COMMON CONDITIONS AND CHALLENGES

- **Cerebral Palsy:** Physical disabilities, dental abnormalities, and neglect of oral hygiene make these children more susceptible to periodontal diseases. The prevalence of periodontal diseases is higher in children with cerebral palsy because of physical disabilities, dental abnormalities, neglect of oral hygiene, inability to chew, swallow and consume hard foods, and taking of foods rich in carbohydrates. Alterations in neuromuscular problems in the orofacial area affect nutrition and the emergence of parafunctional activity and challenges in oral health maintenance. Also, dyskinetic movements lead to pathologic oral reflexes including biting or nausea. Musculoskeletal disorders also limit the capability of the patient to brush his or her teeth properly. Cerebral palsy patients are always challenged when it comes to chewing and swallowing because of alterations in tongue, cheek, and lip movements. In these patients, there is an imbalance in the composition of the oral microbiota, where the levels of acidogenic bacterial species, which are involved in the beginning of the caries process, are increased. Among the periodontal pathogens identified in periodontal pockets, some of them were; *Actinobacillus actinomycetemcomitans*; *Prevotella intermedia*; *Eikenella corrodens*; and *Capnocytophaga sputigena*. Severe form of periodontal disease in children leading to early tooth loss is rare and is commonly found in children with chronic diseases and disabilities affecting the immune system.



Fig 6: Levels of acidogenic bacterial species increases in patients with cerebral palsy

- **Autism Spectrum Disorder (ASD):** Autism spectrum disorder (ASD) is a developmental disorder that affects the brain and manifests itself through communication, social interaction and limited and repetitive behaviour. Some of the aspects include stereotypical or repetitive movements and the use of objects, or repetitive speaking. Some research papers have found that children with ASD are more vulnerable to the formation of plaque and dental caries if the food particles remain in the oral cavity for a longer time. The hand skills of autistic children are not adequately developed and therefore they cannot do proper and efficient tooth brushing. Because mechanical plaque control cannot be done here, the periodontal, as well as the gingival problems, set their course. At first, there is inflammation of the gingiva and if this condition is not treated at the early stage, then it leads to periodontitis in a gradual process. Superficial mucosal defects or traumatic ulcers are also noted in the oral cavity or on the gingiva of the patients. This problem will be solved by a broad and systematic system of oral medicine. Children also experience night grinding which is mostly evident in apprehensive and uncompliant patients, Night appliances may be recommended to such patients who are a challenge to manage due to issues such as self-harm or bruxism.(6)



Fig 7: Gingival enlargement in autistic patients

- Down Syndrome:** Down syndrome is a chromosomal disorder caused by aneuploidy of chromosome 21. Children with Down syndrome have growth retardation, hormonal disturbances, obesity and neuropsychiatric disorders, susceptibility to infection, impaired phagocytosis, etc. Periodontal anomalies include marginal gingivitis, acute necrotizing gingivitis, severe periodontitis with furcation involvement in the molar area, tooth mobility and frequent loss of teeth in the mandibular anterior area. Hence, it is suggested that in patients with Down syndrome, one should start early routine preventive treatment to avoid periodontal tissue destruction because, in addition to immune deficiency factors, these children cannot effectively control bacterial plaque through efficient brushing. Sufficient oral hygiene requires the periodontist to explain to the family how to maintain oral hygiene about all the instructions given by the periodontist. Medical agents in paediatric patients with Down syndrome and suffering from seizures utilize them to control dry mouth caused by low salivary flow rate, which may result in xerostomia creating a proper environment for periodontal diseases and caries. Moreover, it is also possible to identify high levels of tooth wear in these patients which is connected with bruxism and an acidic oral environment as a result of gastric reflux and vomiting.



Fig 8: Marginal gingivitis, Frequent loss of teeth, xerostomia observed in Down Syndrome children

- Visually Impaired Children:** Visually impaired people face challenges in practicing good hygienic practices because they cannot see the plaque on the tooth surface and cannot determine whether dental plaque has been effectively rinsed off. It is important to avoid the use of the tell-show-do approach for the treatment and explain it through the use of touch, taste, and smell. The expert must be friendly should address the patient in a friendly manner and should describe the procedures in detail. The children must also be informed about any possible strange noises and must be prepared for that. Communication and trust will be the basis of establishing a relationship with such children.
- Hearing Impaired Children:** There is a general misinterpretation that hearing-impaired children tend to be dumb as well. This is not true because hearing-impaired children can learn to talk, but this ability will depend on the environment in which they are growing up. Visually impaired children and hearing-impaired children are more susceptible to gingivitis and dental caries than their normal peers. These children are very prone to developing aggressive periodontitis and dental caries as a result of ineffective oral hygiene and their plaque index is significantly higher than the one in normal peers. Hence, parents and teachers need to be educated regarding the need to supervise the oral hygiene of hearing-impaired children and visually impaired children. These special children cannot perform brushing and flossing

effectively. Plaque control procedures can be initiated in school. However, they should also be advised to use non-cariogenic snacks instead of sugar-rich snacks.

GENERAL GUIDELINES TO FOLLOW :

1. The parents of special needs children must be educated about oral hygiene.
2. Special needs children who are unable to take proper care of their oral health should be provided with in-office preventive treatments and supervised brushing.
3. Instructions on tooth brushing should be repeated frequently to them.
4. The family should be involved in the treatment.
5. Children with a disability that impairs their brushing skills should be provided with fluoride and preventive treatments frequently to avoid caries and periodontal problems.
6. Instructions on oral hygiene and general procedures for plaque control must be provided to children with special needs.
7. Parents and teachers must also supervise and control the brushing habits of these children at home and school.
8. Programs on nutrition education can also be initiated to reduce the intake of sugar- sweetened foods.
9. For those children who cannot brush by themselves, the parents must assist them by standing or sitting behind the child.
10. It is important to establish good communication with a child with special needs and to identify their primary mode of communication.
11. In the case of aggressive periodontitis, antibiotics must be given alongside proper periodontal treatment.
12. Parents and children should be taught how to floss their teeth properly and be advised to include it in their routine as well.

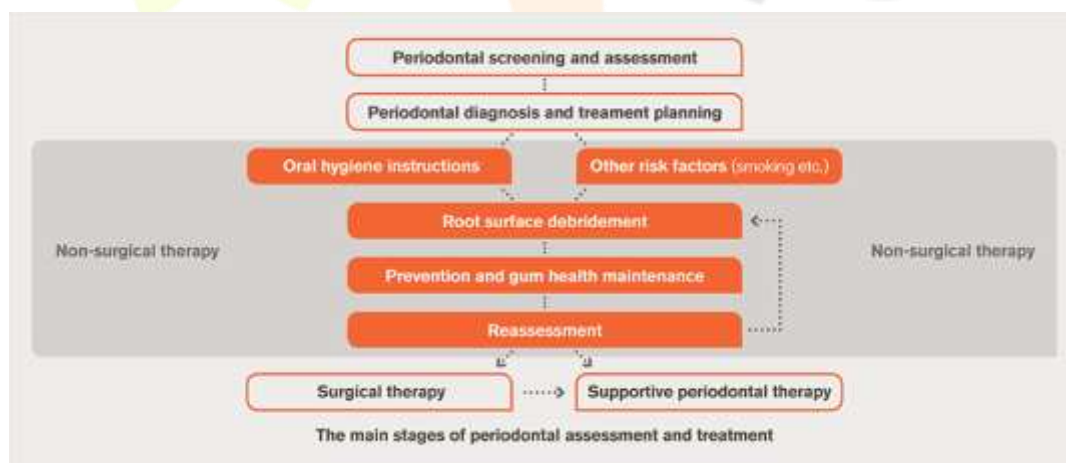


Fig 9: Periodontal assessment and treatment

Conclusion

Periodontal health should be preserved at any age and in any disease state. According to the WHO, periodontal health is characterized by the lack of inflammatory diseases that hinder a person's functioning. Children must be diagnosed early and receive appropriate treatment, especially those with special requirements. It is the education and assistance of caregivers that help maintain the oral hygiene of these children. For elderly individuals, addressing physiological, chronic health, financial, and psychological challenges is crucial to maintaining periodontal health. By understanding and addressing the unique needs of geriatric and pediatric patients, we can improve their overall periodontal health and quality of life.



Pic courtesy: internet sources

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