

PERIODONTAL HEALTH: A BIGGER ROLE IN GERIATRICS

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ABSTRACT: Geriodontology refers to the field of dentistry that mainly encompasses diagnosis, treatment and prevention of oral diseases and conditions in the elderly individuals. With increasing life expectancy attributed to the developments in the field of medicine, there is concomitant increase in the comorbidities and complications in the older population. In the dental perspective, increased attrition of teeth, xerostomia induced dental caries, chronic periodontal diseases and partial edentulousness are the most frequently encountered problems. The management in these instances requires additional considerations, keeping in mind the presence or absence of other systemic diseases, age and the social and environmental factors. In order to provide efficient treatment and also to encourage their constant maintenance protocols, a multimodal treatment planning has to be designed and dentists must be specifically educated and specialised in dealing with the geriatric patients. This review paper highlights the various aspects on periodontal management of geriatric patients with few futuristic suggestions in order to improve their oral healthcare in this phase of life.

Keywords: geriodontics, geriatric patients, periodontitis, attrition, systemic diseases.

INTRODUCTION

The current century has seen a tremendous increase in the proportion of elderly population which is also known as the 'geriatric age group'. Increased health awareness combined with the state-of-the-art medical infrastructures in developed and developing countries, has been a boon to combat debilitating diseases, hence increasing the life expectancy of this age group. Among the total world population, 11% of it is comprised of individuals >65 years of age, which is referred to as the geriatric population. There is also an expected increase of this age group by 2.5% every year according to the World Health Organization.^[1] In the Indian scenario, 80 years is seen as the life expectancy by the year 2050 as per data.^[2]

The older adults usually have a plethora of underlying medical conditions. Some of the most encountered conditions are hypertension, myocardial infarction, osteoporosis and stroke. Apart from these conditions, other disorders that can be encountered are neurodegenerative

diseases like Parkinson's disease, dementia, vertigo and Alzheimer's disease.^[3] According to the World Health Organisation (WHO), elderly population is identified and prioritised as one of the main targets. An Ideal aging can be summarized as the less prevalence of the disease and disease-related disability with high physical and cognitive functionality including mental and psychological alertness.^[4]

Optimal health of the oral cavity is an integral part of systemic health and oral cavity is referred to as the gateway of overall health. Compromised oral care has been considered a risk factor for various general health problems. Griffin et al, in his study stated that there is a definitive and a strong correlation between general and oral health in the elderly population.^[5] Also, with increasing age there is more prevalence as well as severity periodontitis. According to National Survey of Adult Oral Health, in the years between 2004–2006, Roberts- Thomson have reported that moderate to severe forms of periodontitis can be detected in 25% of population aged between 35 to 54 years. However, 44% of 55 to 74 year olds had moderate or severe periodontitis, and this increased to 61% of over 75 year olds.^[6] Similar results were substantiated by the WHO, which provided data showing that 45% of individuals aged more than 65 years had CPI scores of 3 or more and just 7% had no symptoms.^[7]

Periodontitis being chronic in nature can lead to extensive and irreversible damage to the tooth supporting apparatus if not intercepted at the appropriate time, and can also lead to a poor oral health-related quality of life. Also, many researchers suggest a strong correlation between periodontitis and other systemic diseases (e.g., cardiovascular disease, Osteoporosis, rheumatoid arthritis, respiratory diseases, cognitive impairment, Alzheimer's disease & diabetes mellitus) emphasizing the importance of understanding, preventing and treating periodontal diseases.

PERIODONTITIS AND THE ELDERLY

Past literature studies have strived to identify various aspects of oral healthcare in elderly patients, but periodontal treatment in the elderly is a path less explored. It is considered as a separate entity and many factors ought to be analysed before delving into a diagnosis. The following section highlights the various risk factors and pathogenesis of periodontal disease progression in the elderly, the diagnostic criteria and various methods of periodontal management.

Risk Factors in geriatrics

Prevention is a fundamental concept in dental practice, particularly for the long-term management of patients. The susceptibility of an individual to periodontal disease is not always the same as the immune response may vary between them even against the same pathogenic microbes.^[8] There are a plethora of risk factors that can be described in conjunction with periodontal diseases. They can be broadly classified into modifiable and non-modifiable risk categories. The former category consists of factors that can be successfully reduced or eliminated. On the other hand, non-modifiable risk factors cannot be altered or controlled. The modifiable risk factors that have been strongly associated with periodontitis are smoking, Type II diabetes mellitus, poor socio economic background and status, improper oral hygiene practices and poor oral hygiene maintenance, and/or lack of access to routine dental care, psychological stress, vitamin D and vitamin C deficiencies.^[9] The risk factors associated with periodontitis such as genetic predisposition, tooth abnormalities, osteoporosis, myasthenia gravis, alzheimers disease are non-modifiable, including the natural aging process itself.

Dental care for a geriatric dental patient commences with a detailed and a comprehensive medical history, evaluation of health status and risk factors for oral disease, and a close

association with other health professionals who are caring for the patient. Aging with existing co morbidities can enhance the chances of increased periodontal disease progression, and the response to conventional treatment can remain questionable and challenging. Therefore, oral healthcare providers could deliver a broader health message to their patients. This message links oral health to health, with the goal of improving health outcomes. This approach is of importance for older adults, but healthy lifestyle management should begin well before the onset of other non communicable chronic diseases.

Etiopathogenesis of periodontal disease

Even though periodontitis is a multifactorial disease, the major cause is mainly attributed to the deposition and development of microbial biofilm, which initiates an immunoinflammatory response. The oral cavity is colonised by a varied range of commensal periodontal bacteria, many of which are advantageous in preventing the colonization and growth of potentially harmful transient microorganisms.^[10] However, an increase in the burden of pathogenic periodontal bacteria results in the formation of biofilm on and between the teeth which can initiate the disease process. Feres et al. reviewed the changes in the periodontal microflora as a possible underlying cause for the increased prevalence of periodontitis associated with aging and did not uncover any major differences in the composition of the microflora that are attributable to aging.^[11] Ebersole et al., provided a comprehensive evaluation of changes to the inflammatory and immune responses with aging. Their focus is on ‘immunosenescence’, or a reduced immune response as a result of persistent antigenic stimulation, and the subsequent enhancement of the inflammatory response, referred to as ‘inflammaging’.^[12]

Regular oral prophylaxis, adequate oral hygiene instructions and patient motivation, are normally enough to maintain an acceptable oral hygiene. However, if there is a lack of good oral health maintenance, the pathogenic dental plaque mineralises over a period, and form calculus beneath the gingival margin. If this is not adequately managed by a dentist on regular visits, it may lead to inflammatory gingiva progressing to gingivitis. This condition generally heads the initiation of periodontitis, and can be reversed by scaling and root planning and following good oral hygiene practices, which is generally a common protocol for any dental treatment.

There has been a thought shift process from the concept of microbial symbiosis causing periodontitis to microbial dysbiosis. The development of this oral dysbiosis has a chronicity and occurs over a prolonged time period, gradually changing the symbiotic host–microbe relationship to the destructive one.^[13] Throughout this phase of transition, the oral health of the host declines until a state of clinical disease occurs. Concurrently, there is a development of complexes of pathogenic microflora. The initial complex that been found to be associated with disease is comprised of anaerobic gram-negative species such as *Prevotella intermedia*, *P. nigrescens*, *P. micros*, and *Fusobacterium nucleatum* referred to as orange complex. With the progression of the disease and further deterioration, the microbiota shifts to the pathogenic red complex bacteria, which consists of *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Treponema denticola*. And these are mostly found in the deeper periodontal pockets.

Barriers to Optimal Oral Health in elderly individuals

Supportive care from care givers is often seen as a necessity for an older individual as their physical and mental dexterity is usually compromised. Degenerative arthritis, neuromuscular changes, and diabetes-related compromised extremities may have a negative impact on an individual’s ability to practice effective oral hygiene care on a day to day basis. These factors furthermore increase the chances of the elderly developing periodontal disease. Those with

poor hand function have also shown the increased plaque accumulation on teeth and dentures.^[14]

Periodontal diseases Diagnosis in Geriatric Patients

The probability of oral health care professionals treating older individuals is on an increasing trend these days. The underlying comorbidities and multiple drug intake practices (polypharmacy) in the elderly makes the diagnostic criteria even more challenging. Geriatric patients may present with multiple systemic disease, which may or may not be diagnosed at that time. Recent studies have shown that about 90 percent of the systemic conditions have oral manifestations. Hence by proper clinical examination of the oral cavity, the manifestations of many systemic diseases can be noticed. At times dental clinics can be the first place where diseases such as diabetes, osteoporosis, leukaemia, HIV, desquamative diseases and various other systemic diseases can be diagnosed. To list a few, dermatological lesions can manifest as erosions or ulcerations in the buccal mucosa or gingiva and uncontrolled diabetes may manifest as multiple gingival enlargements. Haematological disorders such as anaemia can present with mucosal and papillary atrophy and leukaemia can be diagnosed by petechial appearance in the buccal mucosa and bluish discoloration with a tendency to bleed, which can be observed in the gingiva.

Considerations for Treatment Planning

Many aspects are to be consider whilst planning a dental treatment for an aged adult such as their social support system and sociological variables, daily functions, current oral hygiene status and their ability to maintain it in the future if care is provided. Keeping these factors in mind, the OSCAR approach has been devised. It is a systemic approach flowchart for the dental management of elderly individuals. The abbreviation OSCAR represents: **O**ral and dental needs, **S**ystemic factors, **C**apability, **A**utonomy and **R**eality.^[15] This approach summaries and takes into consideration all the aspect such as the medical, dental, pharmacological, functional, ethical, and fiscal factors that should be analysed when undertaking the dental care for elderly and disabled individuals. Another important consideration tool was developed by Macentee and Waytt namely the “clinical oral disorders in elders” (CODE) index for disabled elders.^[16] This index is created based on 27 clinical disorders covering 5 major areas: Mucosal health, jaw movements, mucosal health, dentures, teeth and periodontium, and mucosal health. When combined with a psychosocial index, it forms a very specific indicator of oral dysfunction in the elderly.

Therefore, developing a case-specific treatment plan becomes mandatory in achieving an ideal outcome for the elderly individuals as it is chiefly dependent on extent of tissue destruction. Therefore, the treatment plan should include management of the disease progression through non-surgical or surgical treatment modalities. Diet and lifestyle modification may aid in the improvement of patient health thereby preserving the natural dentition. Once a diagnosis of chronic periodontitis has been made, the emphasis of treatment shifts to mechanical debridement procedures of the tooth and root structures in order to achieve complete removal of plaque and calculus both supra and sub gingivally.

Nonsurgical Intervention

This approach mainly includes scaling and root planing of the affected area, which may sometimes be accompanied by the prescription of antibiotics in selected clinical scenarios. Scaling and root planing are the foremost commonly and widely used approach in management of mild, moderate, and severe forms of periodontitis. For managing isolated pocket depth more than 5mm, the usage of local drug delivery system (tetracycline fibers, chlorhexidine chips, minocycline microsphere) is proven to be beneficial. In more advanced

cases of periodontitis, when the pocket depth exceeds 7 mm, the procedures such as use of subgingival irrigation systems has also proven to be beneficial in adjunct to scaling and root planning in reducing bleeding and pocket depths.^[17]

Surgical Intervention

Several surgical modalities have been the treatment of choice to manage moderate and advanced forms of periodontitis. These are often used after the initial nonsurgical treatment approach which is mainly scaling and root planing. The commonly used surgical approaches for the management of periodontitis usually classified as soft tissue surgical procedures, osseous resective and regenerative treatment modalities. Recently minimally invasive periodontal therapy has proven to be beneficial in treating periodontitis patients since healing and patient compliance is more with these advanced procedures.

Periodontal surgery can be used to eradicate any residual pockets after a non surgical therapy or to gain tooth substance in case of fractured teeth and crown/root caries. Resective osseous therapy is the modality of choice to eliminate active pathological pockets. (i.e. decrease in the depth of soft and remodelling of the supporting bone). Periodontal regeneration can be done by reducing the soft tissue depth of the pocket and regenerating the lost periodontal tissue support. Plastic surgery can be done to manage soft tissue deformities as in the elderly, the most commonly encountered soft tissue deformity is gingival recession. In this population, gingival recession in most cases is caused by bone loss, both buccally and interproximally. In such cases, gingival root coverage procedures may not be indicated and crown lengthening is instead an opted procedure. In most of the clinical scenarios, minimally invasive approaches are highly recommended.

Maintenance Therapy

Gingival recession in the elderly can be accompanied by severe sensitivity and may contribute to mobility of the teeth, eventually leading to tooth loss. The management usually demands a surgical root coverage therapy, but in the elderly, it might not be the best of options. Alternatively, management is planned as minimally invasive as possible, by altering oral hygiene habits, prescribing home care devices for inter dental cleaning and splinting the teeth in case of increased mobility. In general, tooth retention in the elderly has been linked to improved quality of life, and regular dental visits are associated with tooth retention and therefore with a better class of living.^[18] Tooth loss in the elderly can be considered as a disability, manifesting as reduced masticating efficiency and poor dietary choices, and resulting in other challenges in daily functioning, including difficulty speaking^[19] and greater psychological stress.^[20]

Furthermore, xerostomia which is frequently encountered in the elderly can increase the risk for dental caries. There is also noticeable increased attrition in the older age group due to the increased wear and tear. Both these conditions are effectively managed through restorative procedures and root canal therapies.

HOW EFFECTIVE IS PERIODONTAL THERAPY IN OLDER ADULTS?

The literature suggests that age per se is not an important factor in determining the success of periodontal therapy. High-quality treatment for periodontal diseases combined with adequate plaque control, is likely to result in good therapeutic outcome. On the other hand, wound healing, beginning from initial clot formation till extracellular matrix secretion can be undesirably affected by the aging process. In cutaneous wound models, ageing seems to primarily delay the healing rather than affect its quality, and this can be connected to the histologic alterations seen in the periodontium.^[21] Few studies evaluated the result of different surgical approaches and its relation to age. Impaired wound healing following the

gingival biopsies was demonstrated by Holm-Pedersen and Löe in older compared with younger patients.^[22] It is also worth noting that if the patients have retained teeth into old age, they are very unlikely to be highly susceptible to periodontal disease and may have a favourable prognosis.

PERIODONTIST ROLE IN MULTIDISCIPLINARY APPROACH

Management of geriatric patients is a matter of multi-disciplinary approach in which periodontists play a major role. While the replacement of missing teeth and restoration of damaged natural dentition is managed by the specialities of prosthodontics and restorative dentistry, the ultimate success of these treatments is governed by the maintenance of good and quality periodontal health. A prosthesis is said to be efficacious only if the abutment teeth and the surrounding periodontium are healthy. An improperly designed prosthesis can lead to food lodgement and accumulation of plaque, thereby leading to initiation and progression of periodontal disease.^[23] Periodontal disease will lead to loss of attachment, tooth mobility and ultimately loss of tooth.^[24] An increased rate of bone loss and periodontal breakdown was observed in patients over 70 years of age in a retrospective study by Papapanou et al.^[25]

Other instances that demand a multidisciplinary approach are when elderly patients report with severe attrition. As a result, they may experience severe temporomandibular joint pain, for which they require endodontic, periodontic and prosthetic management. In worst case scenarios when there is complete periodontal debilitation, full mouth rehabilitation is considered. Management of root caries is another major issue in older adults which demands both periodontal and endodontic care. Sometimes, older patients are also in need of orthodontic treatment, for which adequate periodontal support is very essential. Thus, the role of a periodontist is vital in multi-disciplinary management of geriatric patients.

IMPORTANCE OF GERIODONTICS IN DENTAL EDUCATION

With the growing proportion of elderly in the last few decades, it is much expected that the geriatric population visiting a dental clinic is bound to increase. Hence, management of elderly patients, especially those with special healthcare needs must be emphasised as a part of the dental school curriculum. A separate speciality of geriodontics like pedodontics, can be encouraged to improve the quality of treatment in the geriatric patients by the dentists. The knowledge, practise and skills of dental professionals has to be constantly updated in terms of management of elderly population seeking dental care through continuous dental education programs. Knowledge on management of medically compromised patients, age related oral anatomical changes, psychological counselling of the elderly must be imparted to the dentists with utmost importance and with greater emphasis.

ORAL HEALTHCARE SERVICES- THE FUTURE

In order to improvise the dental health in the geriatrics, adequate measures must be implemented and their effectiveness has to be evaluated. The elderly should be provided with an easy access to medical as well as specialist dental facilities in times of oral health needs and emergencies in affordable means. Dental screening must be performed to assess the initial healthcare needs among them.

CONCLUSION

Periodontitis in elderly can be prevented if proper oral care is observed throughout one's life. The barriers to adequate oral health maintenance in the elderly has to be taken into contemplation by medical and dental professionals, caregivers and the elderly adults themselves. Ideally, these groups ought to work together proactively to design an efficient healthcare plan, that can adapt to individual's disabilities while addressing any potential areas

of oral health concern. With a perfect combination of the all these professionals, the time is no far when these elderly people will be able to maintain good oral and systemic health thereby enjoying this phase of life in much healthier way.

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