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Chapter 14

Oral Health Care Needs in the Geriatric Population

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Additional information is available at the end of the chapter

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1. Introduction

During the first decade of the 21st century, medical advances have increased life expectancy significantly, especially in the developed world. Life-threatening infectious diseases have notably reduced and many chronic diseases can be better controlled by long-term medications and surgery. Improvement in the understanding and treatment of oral health issues has also resulted in the definite improvement in oral health. There were 390 million people in USA aged over 65 years as per the figures of the 1998 World Health Report and this figure is estimated to double by 2025. In many developing countries, particularly in South America and Asia, it is predicted that there will be an increase of up to 300% of the elderly population in the next decade. By 2050, there will be 2 billion people over the age of 60, with almost 80% living in developing countries [1]. The growth in this group of citizens is staggering, posing tremendous challenges to those involved in planning the care that is necessary for this ageing population. At the end of 1950s, the population over seventy years of age was mainly edentulous. However with better access to oral health care and better understanding of oral diseases and newer treatment modalities, the mean number of retained teeth had increased to 14 by 2010 and this can be expected to rise further in the years to come. This new group of partially dentate elderly who carry the burden of chronic disease and are on multiple medications, presents a new set of problem areas to the clinician. However, in the some of the lesser developed countries the situation and the problems are different. Though life expectancy has increased the oral health status has not kept pace. Thus there is significant loss of teeth in the elderly and this reduced dentition also affects food intake leading to vitamin deficiency or even malnutrition. There is an urgent need to understand the oral health care needs of these different groups of geriatric patients as well as improve the quality of prosthetic rehabilitation.

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2. Age changes in the elderly

Among the aged there is a high prevalence of co-morbidities and numerous barriers to care. Oral health conditions include: High caries prevalence; Advanced Periodontal disease/ loss of attachment and poor oral hygiene; Edentulousness and limited masticatory functioning; Denture related conditions, ill fitting removable dentures; Head and neck cancer or co-morbidities due to radiation or chemotherapy; Xerostomia; Craniofacial pain and discomfort [1, 2].

The oral mucosa becomes thinner and more vulnerable to external injuries with advancing age. Thus the prevalence of soft tissue changes has been reported to be high among the elderly. Ill-fitting dentures are also known to increase the risk of oral mucosal changes. There is a well established association between prosthetic factors, denture hygiene and presence of oral mucosal lesions in the elderly.

Intake of multiple medications results in decreased salivary flow, as a side effect, which further compromises the health of the fragile oral mucosa. Saliva neutralizes the production of acids by oral microflora and also helps in tooth remineralisation. Saliva has numerous protective benefits for the teeth and the oral mucosa due to its content of immunoglobulin A and lactoferrin [3]. Reduction in salivary flow results in an increased number of oral micro-flora as well as their metabolic by-products in the oral cavity. This leads to an increase in the caries index and also results in increased tooth loss to periodontal diseases. Changes in physical and mental status also manifest as a deterioration of co-ordination and motor skills that are necessary for maintenance of proper oral hygiene. These reduced oral hygiene practices further contributes to prolific growth of harmful oral microflora [4, 5].

Changes in diet as well as altered taste and smell all play their part in reducing the amount of food intake of most of the elderly. When economic factors or the standardized diets provided in hospices or other institutions for the elderly are taken into consideration it becomes obvious of how difficult it is to meet the nutritional goals in the elderly. There is also higher catabolic rates and increase in demand for certain vital nutrients to keep pace with the overall age changes in the body. Thus it is paramount that a close check be kept on the overall nutritional status as well as the appearance of signs and symptoms of malnutrition [6].

3. Residual Ridge Resorption (RRR)

Residual ridge resorption (RRR) is a term that is used to describe the changes which affect the alveolar ridge following tooth extractions, and which continue even long after healing of the extraction socket. The most significant feature of this healing process is that the residual bony architecture of the maxilla and mandible undergoes a life-long catabolic remodelling. The rate of reduction in size of the residual ridge is maximum in the first three months and then gradually tapers off. However, bone resorption activity continues throughout life at a slower rate, resulting in loss of varying amount of jaw structure, ultimately leaving the patient a 'dental cripple' [7].

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The speed and direction of alveolar bone loss is not similar in maxilla and mandible. The changes seen in the mandible are quicker and more dramatic changes due to the unique tear-drop cross-sectional shape of the mandible. In mandible resorption proceeds more in labio-lingual and vertical directions. The net result is that the mandible appear to move downward and outward. In the maxilla the changes occur evenly around the dental arch, but more on buccal and labial side than on the palatal side. This results in the maxilla appearing to move inward and upwards. This differing age changes in the two arches is the reason that there is a relative prognathism of the edentulous mandible seen after many years of edentulousness. Unlike in maxilla, the speed of bone loss in mandible is different in different parts of the jaw i.e. distal parts of the residual ridge resorb faster than the anterior region [8].

Multiple factors can affect RRR. Age and gender differences are well documented; there is a clear correlation between mandibular RRR and females. Systemic factors like osteoporosis, diseases related to thyroid function, medication, general lifestyle and local oral and prosthetic factors might all influence RRR. Due to resorption the mental foramen and alveolar nerve can finally relocate on the crest of the alveolar bone. As a result of this, denture's functional properties can seriously deteriorate and wearing a mandibular denture can be a very painful experience. Functional stability, a combination of stability and retention of the denture, is strongly affected by the degree of RRR and condition of the denture, especially in the lower jaw. As a consequence of RRR, location of mandibular related muscle attachments are situated closer to the crest of mandibular bone [9]. In combination with age-related muscle atrophy and dry mouth, this may lead to a situation where denture-wearing experience, especially of worn-out dentures, is very unsatisfying and frustrating.

4. Prosthetic rehabilitation in the elderly

Poor retention and stability of complete dentures is one of the main dental related complaints in edentulous persons. Poor retention is often related to loss of alveolar bone support. Reasons for residual ridge resorption (RRR) are multiple and may vary among individuals. It begins after extraction of teeth and progresses at varying speed for the rest of the life. Both local and systemic factors may affect the rate of RRR.

Total or partial loss of natural teeth as such does not necessarily mean that the missing teeth have to be replaced with dental prostheses. The elderly often consider it acceptable to have a few missing teeth as long as they are can be socially and functionally satisfactory. Thus they delay in reporting for dental treatment and this further complicates their chances for complete rehabilitation. The clinician's objective plan for rehabilitation alone is not considered justified enough to undergo treatment. Missing anterior teeth are often sought to be replaced immediately for esthetic reasons but there are no generally accepted criteria for replacing missing teeth, especially in the posterior region. The maximum masticatory efficiency has been seen to be in the region of the premolars and first molar and the patients adapt accordingly if other teeth are lost. Current consensus appears to be that a minimum of four functional occlusal units in shortened dental arches are sufficient to maintain the healthy natural function of the

dentition. Patients find it easier to adapt by changing their intake to softer foods or elimination of foods from their diet that are difficult to masticate. This leads to a state of gradual and progressive tooth loss till the patient becomes totally edentulous and then perforce has to opt for the "complete dentures" which are often seen as a dismal symbol that the person is 'aged'.

Complete upper and lower dentures have been the most common form of prosthetic rehabilitation in the totally edentulous group of aged persons. Conventional complete dentures are still the most acceptable and economically affordable form of prosthetic rehabilitation especially in developing countries. Extreme old age, long travel time or inability to travel to the nearest dental clinic and low income are the primary reasons for inadequate prosthetic treatment of edentulous persons [10].

Implant-supported dentures based on osseointegrated titanium implants are the gold standard in dental rehabilitation. Patients who are economically 'well-off' have the option of choosing implant supported over-dentures. These are significantly more acceptable and masticatory function can be restored to a great extent. A well designed mandibular over-denture supported by osseointegrated implants, will enhance the whole masticatory experience more significantly by increasing biting force and improving the biting and chewing function [11]. Today, implant procedures are well-documented to replace missing teeth or to provide retention for complete dentures. Adequate number of implants if placed early can even slow down the inevitable RRR. From the medical point of view there is limited contraindication for the use of osseointegrated implants, but the majority of implant treatment still remain beyond the reach of the majority of elderly.

There has been a noteworthy change in oral health care planning, in that the earlier concept of replacement of every missing tooth is no longer is considered as essential. In subjects with reduced natural dentition, as long as there is sufficient masticatory efficiency to meet the nutritional requirements of the individual and the aesthetic concerns have been fulfilled, there is no need to replace all the missing teeth. Thus, a shortened dental arch (SDA) as such does not dictate an urgent need for prosthetic treatment. As long as there is occlusal stability and functional occlusion is maintained, free-end removable partial dentures (RPD) may not provide significant masticatory advantages and may be avoided.

Rehabilitation using RPD's demands a high level of competence on the part of the clinician and a regular follow-up from the patient. These dentures can actually cause more harm than good if long term oral health is not maintained and the resultant forces generated by these prostheses can be highly detrimental to the health of the remaining teeth. Those patients who have been provided with RPD's need regular follow-up and care to ensure that their dentures are functioning as planned and necessary oral care is being maintained. Failure to properly maintain the RPD's in some cases may increase the risk of caries and periodontal disease for the remaining dentition thus worsening oral health [12]. It is important to keep in mind that RPD patients need regular surveillance through a recall system. This is not an easy task when dealing with elderly patients, bearing in mind that they form the component of population that faces the greatest number of barriers to oral health services.

Today, the ever-increasing number of geriatric cases requiring oral rehabilitation necessitates new treatment strategies. There may be a difference of opinion between the treating clinician and the patients regarding the treatment plan and objectives and this may complicate treatment planning. In most cases, patients desire good aesthetics and comfort, whereas the dental surgeon would often stress on the importance of good functionality. The minimum number of teeth needed to satisfy functional and social demands varies individually. This depends on multiple local and systemic factors, such as periodontal condition of the remaining teeth, occlusal forces and a person's adaptive capacity and age. Thus, the greatest challenge for the clinician is to choose between either treating the patient with the risk of producing iatrogenic disease, or, not treating the patient and resulting in reduced nutritional intake or gastrointestinal disorders. Economic factors also play a significant role in the choice of treatment as the material costs are normally prohibitively high. Even health insurance schemes provide limited cover as far as oral rehabilitation schemes are concerned. This further widens the gap between ideal and essential treatment and it is the geriatric patient who ends up facing the worst outcome in such a scenario.

5. Denture hygiene and oral lesions

Numerous mucosal lesions such as denture stomatitis, angular cheilitis, flabby ridge, irritation hyperplasia, traumatic ulcers and even cancer have been associated with the prolonged use of unhygenic or grossly worn-out removable dentures. Up to seventy-six per cent of all oral mucosal lesions have reported to be inflammatory or reactive in nature [13].

Candida albicans is the most common microorganism related to denture wearing. Several studies have been conducted to explore the relationship between yeasts and denture-induced stomatitis. Close correlation between the use of dentures at night and smoking has also been reported. The influence of patient's age, denture hygiene, use of drugs and denture wearing habits has been well documented. Also a low salivary flow rate may predispose the oral mucosa to the pathological changes because of its association with the presence of yeasts inside the mouth cavity. The number and type of several oral microflora have also been shown to be elevated in denture wearers and in the elderly suffering from xerostomia [14].

Against this background the role of plaque removal cannot be stressed enough. Older people seem to be generally well informed of the importance of good oral and dental hygiene and their effect on oral health, but less aware of the poor results of their well-meaning cleaning efforts. Most older citizens brush their denture under running water at least once a day, but with the age-related reduced manual dexterity the outcome is hardly ever good. It is obvious that written and verbal information alone is not enough to establish positive oral hygiene behaviour and results. Indeed, repetitive cleaning demonstrations and motivation sessions may be the only way to attain longer lasting changes.

Trauma induced by ill-fitting dentures has been supposed to be the main reason for "denture sore mouth", and tissue hyperplasia. Even with new dentures, ulcers may develop very fast often within few days after fitting of the denture [15, 16]. Thus, denture-associated ulcers are

relatively common and patients should be advised to report regularly for follow-up every four to six weeks for new dentures and every six months thereafter. This will ensure that there is immediate intervention to prevent any trauma from age changes of the oral mucosa under the dentures.

In the end there seems to be many conflicting opinions on the nature of oral mucosal lesions. The principles concerning the criteria for treatment needs and preventive treatment methods have been, however, agreed by the majority of authors. Some oral mucosal lesions may be avoided by regular examinations and adjustments of dentures, good oral and denture hygiene and wearing the dentures only during the day [11].

6. Oral health care planning for the geriatric population

Ageing is inevitable, irreversible and a reality that all have to deal with. As people get older, oral health planning needs to refocus its objectives so that they are sustainable with regard to the general health and financial circumstances of the elderly. It is important that people need to have access to oral health care that is based on preventive concepts and be actively involved in making choices about their oral health right from the fifth and sixth decade of life. This will ensure that they can attain a level of oral health that can be maintained into older age [17, 18].

To make this a reality it is essential to utilize the full spectrum of oral health care workers (dental surgeons and specialists, dental hygienists, dental technicians and dental auxiliary staff) in health care set-ups for the elderly [19].

To ensure sustainable change in any oral health scenario, it is vital that consumers and communities be actively involved in decision making about oral health, and empowered to maintain their oral and general health and wellbeing. Current information on the incidence, distribution and determinants of oral diseases must be used for evidence-based planning on the effectiveness and cost effectiveness of oral health intervention. For this national and local oral health surveys must be carried out as they can provide the latest and authentic data about all aspects of oral health status, disease, and their determinants [20, 21].

People with cognitive impairment face a higher risk of oral diseases. Any impairment in maintenance of adequate oral hygiene will result in high caries index and poor periodontal conditions. This increases the cost and complexity of providing oral health services in community, hospice and old-age homes. Co-morbid general health conditions also complicate the effective delivery of medical care services. Reduced masticatory efficiency affects nutrition and can cause reduction in body weight. All these must be factored in while planning, execution and maintenance of any health plan for the eldely

As age advances, there is a gradual decrease in immunity which along with physiological changes and multiple risk factors manifests as an increased risk of infectious disease. Infections such as pneumococcal, influenza, tetanus, and zoster are more common among the older generation. These infections are major causes of morbidity and mortality and are responsible for a large number of deaths and hospitalizations among the elderly. Communicable diseases

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like influenza and pneumonia are the fifth leading cause of death among elderly persons. Among the many infections to which the elderly are prone, some can be prevented by administration of suitable vaccines. Vaccination of the elderly can be one of the most effective and economic methods means of prevention of long term disease, disability, or death resulting from communicable illnesses [22].

There is an urgent need to train the entire oral health team to meet the needs (including oral health promotion) of older people [19]. A multidisciplinary team approach is needed, involving a complete team of oral health specialists & other primary health care providers (medical and allied health). The poor oral health status of people in residential aged care hospices is clear evidence that the requisite objectives are not achieved with current health planning. There is a need for a fresh approach to ensure that appropriate medical and oral health treatment needs are met within residential facilities for geriatric individuals [23 – 25].

7. Conclusion

Oral health while being important at all stages of life assumes greater value at extreme old age. Worldwide, people are living longer lives as a result of better understanding of disease processes, health concerns, and improvements in overall standards of hygiene and living conditions. Paradoxically, this does not signify that they are necessarily living healthier lives-chronic systemic diseases including oral diseases are on the rise. A decline in oral health is manifested as higher numbers of missing teeth, rise in caries index, and an increase in the prevalence rates of periodontal disease, xerostomia and oral pre-cancer/cancer. Non-communicable diseases are fast becoming the leading causes of disability and mortality, and in the near future health and social policy-makers will face tremendous challenges posed by the rapidly increasing burden of chronic diseases in old age.

The negative impact of poor oral conditions on the quality of life of older adults is an important public health issue, that must be addressed by health care planners at all levels. The need of the hour is to translate knowledge into action programmes for the oral health of older people. It is the responsibility of National health planners to develop policies and set priorities and targets for satisfactory oral health. National public health programmes should incorporate oral health promotion and disease prevention based on the common risk factors approach. In developing countries the challenges to provision of effective oral health care are predominantly high because of a variety of factors related to vast populations and the resultant disparity between the rich and the poor. In developed countries too, oral health services need to be revised to take a preventive approach when considering the oral care needs of older people. Funding for better research for optimum oral health should focus beyond just the biomedical and clinical aspects of oral disease. Private-Public partnerships must be encouraged to allow research and efforts to translate science into practice. Education and continuous training must ensure that oral health care providers have the requisite skills and a thorough understanding of the biomedical and psychosocial aspects of care for geriatric group of patients. It is imperative for all of us to undertake whatever we can do to ensure that the oral

health care needs of the aged are met before it is too late. A sustainable plan to mitigate the spread of oral disease and illness in older adults should be strengthened by means of an organized, affordable, comprehensive oral health service which can be easily accessed by all.

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