

# Gerodontology - Oro dental care for elderly

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## ABSTRACT

Changing demographics, including an increase in life expectancy and the growing numbers of elderly, has recently focused attention on the need for geriatric dental care. Ageing affects oral tissues in addition to other parts of the human body, and oral health (including oral mucosa, lips, teeth and associated structures, and their functional activity) is an integral component of general health. Oral disease can cause pain, difficulty in speaking, mastication, swallowing, maintaining a balanced diet, not to mention aesthetical considerations and facial alterations leading to anxiety and depression. Certain strategies should be adopted for re-establishing effective masticatory function. Oral health is often neglected in the elderly and oral diseases associated with aging are complex, adversely affecting the quality of life. Although majority of oral health problems are not usually associated with mortality, nearly more than half of the deaths due to oral cancer occur at an age of 65 years plus. This review of geriatric dentistry, which is dedicated to geriatric physicians, geriatric dentist and specialists in oral medicine, emphasizes on age-related oral changes in elderly patients and efforts to summarize the effects of aging in hard and soft oral tissues.

## Key words

Dental care, elderly, gerodontology

## INTRODUCTION

Gerodontology is the delivery of dental care to older adults involving the diagnosis, prevention and treatment of problems associated with normal aging and age-related diseases as part of an interdisciplinary team with other health care professionals.<sup>[1]</sup> An overview of the demographics and oral health status of the elderly population of India is presented. India is a vast country with a population of one billion people. Of this, people older than 60 years constitute 7.6%. There are several factors that affect the oral health of elderly. The dentist: population ratio is 1:27,000 in urban areas and 1:300,000 in rural areas, whereas 80% of the elderly population reside in rural India. Forty percent of the elderly live below the poverty line and 73% are illiterate. Ninety percent of the elderly have no social security and the dependency ratio is 12.26. Incidence of oral cancer,

which is considered an old-age disease, is highest in India. 13.5% of all body cancers are oral cancers. Preventive dental care is almost non-existent to the rural masses and is very limited in urban areas. Above all, there is no orientation of dental graduates towards the special needs of the geriatric population.<sup>[2]</sup>

20<sup>th</sup> century has witnessed a number of remarkable demographic changes related to health, diseases, longevity and mortality of the population all over the world. By now, one third of the world's elderly population is living in the developing countries and 1 out of 12 persons in the developing countries are over 65.<sup>[3]</sup> The 20<sup>th</sup> century witnessed remarkable population ageing with regard to human longevity worldwide and the 21<sup>st</sup> century is set to carry forward the gains in longevity further, both in the developing and the developed world. This rise in life expectancy is attributed primarily to the substantial reduction in mortality at different stages of life, which has been brought about by improved health care facilities, sanitation, environmental and public health reforms coupled with better hygiene and living conditions. As a result of the increasing life expectancy, the proportion of the elderly in the total population is projected to be around 20% in India and 32% in the developed nations by 2050.<sup>[4]</sup>

Keeping this increased life expectancy in mind, the age

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of retirement in many sectors in India is increasing and in some, it has even gone up to 70 years. In some states, the retirement age has not been raised, but this is because of the concerns regarding the resultant job cuts for the younger generation. As per the Government of India's classification, the elderly are those who are 60 years of age and above; these citizens become eligible for varied concessions offered by the government and other agencies. In the developed world, the elderly are those above the age of 65 years.<sup>[5]</sup>

The mouth is referred to as a mirror of overall health, reinforcing that oral health is an integral part of general health. In the elderly population, poor oral health has been considered a risk factor for general health problems. On the other hand, older adults are more susceptible to oral conditions or diseases due to an increase in chronic conditions and physical/mental disabilities. Thus, old people form a distinct group in terms of provision of care.<sup>[3]</sup> The dental diseases that the elderly are particularly prone to are root caries, attrition, periodontal disease, missing teeth because of earlier neglect, edentulism, poor quality of alveolar ridges, ill-fitting dentures, mucosal lesions, oral ulceration, dry mouth (xerostomia), oral cancers and rampant caries.<sup>[2]</sup> Many of these are the sequelae of neglect in the early years of life, for example, consumption of a cariogenic diet, lack of awareness regarding preventive aspects, and habits like smoking and/or tobacco, pan, and betel nut chewing. All these problems may increase in magnitude the declining immunity in old age and because of coexisting medical problems. As a result of poor systemic health, the elderly patient often does not pay sufficient attention to oral health. In addition, medications like anti-hypertensives, anti-psychotics, anxiolytics etc. lead to xerostomia, and the absence of the protective influences of saliva in the oral cavity increases the predisposition to oral disease. Financial constraints and lack of family support or of transportation facilities affect access to dental services in later life.<sup>[1]</sup>

However, experiences from developed countries show that the prevalence of chronic disease and high levels of disability in older people can be reduced through health promotion and appropriate prevention strategies designed to improve quality of life.<sup>[6]</sup> Older people can be a valuable resource; they can contribute to society within their families, communities, and national economies as either a formal or an informal part of the through volunteer work.

## WHO AND THE HEALTH OF THE ELDERLY

In 1995, in response to the global challenges of ageing populations, the World Health Organization (WHO) launched a program on ageing and health.<sup>[7]</sup> It was designed to advance knowledge about health care in old age through targeted training and research efforts,

information dissemination, and policy development. The World Health Report 1998 emphasized the need to strengthen health promotion amongst older people.<sup>[8]</sup> The health implications of ageing should be better elucidated and understood. Concern for the older members of society is part of the intergenerational relationship that needs to be developed in the 21<sup>st</sup> century. The young and old must learn to understand each other's differing expectations and requirements. In 2002, WHO issued a document entitled 'Active Ageing – A Policy Framework,' which outlines the essential approaches towards healthy ageing and its framework rests on 3 basic pillars: health, social participation, and security. When risk factors for chronic diseases and functional decline are minimized and protective factors are maximized, people enjoy longer life and higher quality of life. Where labor market, employment, education, health and social policies and programs support full participation of the elderly in socio-economic and cultural activities, people will continue to make a significant contribution to society as they grow older. When policies and programs address the social, financial, and physical security needs and rights of people as they age, the elderly are ensured protection, dignity and care in the event that they are no longer able to care for themselves. Oral health is an important component of active aging.<sup>[7]</sup>

## Oral health problems among elderly

Globally, poor oral health among older people has particularly been seen in a high level of tooth loss, dental caries experience, high prevalence rates of periodontal disease, xerostomia and oral precancer/cancer.<sup>[9]</sup> The negative impact of poor oral conditions on daily life is particularly significant among edentulous people. Extensive tooth loss reduces chewing performance and affects food choice; for example, edentulous people tend to avoid dietary fiber and prefer foods rich in saturated fats and cholesterol.<sup>[10]</sup> Edentulousness is also shown to be an independent risk factor for weight loss<sup>[11]</sup> and in addition to the problem with chewing, old-age people may have social handicaps related to communication.<sup>[12]</sup> Moreover, poor oral health and poor general health are interrelated, primarily because of common risk factors; for example, severe periodontal disease is associated with diabetes mellitus,<sup>[13]</sup> ischemic heart disease,<sup>[14]</sup> and chronic respiratory disease.<sup>[15]</sup> Tooth loss has also been linked with increased risk of ischemic stroke<sup>[16]</sup> and poor mental health.<sup>[9]</sup>

As this concept of Geriatric Dentistry is fairly new to the dental surgeons in India, this initial introduction was necessary. Age does not stop. There are some changes as you grow old. These are called geriatric changes. Geriatric changes take place in the body as well as in the oral cavity also. It is the privilege of dental surgeon to study it well and carry out the necessary treatment of the oral lesions.<sup>[17]</sup>

Oral cavity examination includes following parts of oral

cavity: mucous membrane, tongue, gingiva, salivary gland, bone, and teeth.

### **Mucous membrane**

Gums of an adult person are marked shiny and with a stretched appearance. Desired resilience and elasticity are absent. This mucous membrane makes use of dentures very painful. It is important that dental surgeon understands this clinical condition and handles geriatric patient with utmost care. Dental surgeons should be very careful and should avoid any trauma during treatment.<sup>[18]</sup>

Leukoplakia is considered as precancerous condition and tobacco and alcohol could be causative factors. Most of the oral carcinomas are squamous cell carcinomas and common sites are lower lip, tongue, gingivae and floor of the mouth. Oral sub mucous fibrosis (OSMF) is a chronic, insidious, disabling disease involving oral mucosa, the oropharynx and rarely the larynx. It is exclusively reported in elderly Indian population. The disease is characterized by blanching and stiffness of the oral mucosa, trismus, burning sensation in the mouth, hypo mobility of the soft palate and tongue, loss of gustatory sensation and occasionally, mild hearing loss due to blockage of eustachian tube. A variety of etiological factors include capsaicin, betel nut alkaloids, hypersensitivity, autoimmunity and genetic predisposition.<sup>[19,20]</sup>

### **Tongue**

Dorsum of the tongue shows reddening, atrophy of the papillae at the tip. Tongue may be completely smooth lobulated. These changes bring about an altered taste and decreased appetite. Increased varicosity at the ventral surface is common with elders. It does not call for any treatment unless symptoms appear. Glossodynia or burning tongue, is seen in many adults, sometimes with no apparent clinical picture. It may be vitamin deficiency. Macroglossia, increase in the size of the tongue, in elders is mainly because of loss of tone of muscles of the cheek or expansions or oral cavity as result of loss of teeth. Elderly people are less enthusiastic about proper oral hygiene. They consider other health disorders first on priority bases. They must be explained the consequences, they must be motivated by calling them periodically for checkups.

### **Salivary glands**

In geriatric patients, salivary flow is decreased causing a condition known as xerostomia. It was presumed that it is an aging process. Now, it is clear that salivary dysfunction is because of certain medicines and systemic diseases. Etiologies that lead to xerostomia are medicines (anti-histaminics, anti-hypertensives, diuretics, anti-depressants) and radiation therapy. Unfortunately, these drugs are prescribed to adults very often and hence xerostomia is considered a disease of geriatric patients.

### **Treatment of xerostomia**

Methods to reduce mouth dryness include avoid dry and bulky foods, spicy or acidic foods and alcoholic beverages. Sucking on sugar-free lozenges or chewing gum to stimulate saliva production, keeping hydrated by sipping water frequently, using a humidifier while sleeping, avoid caffeinated drinks avoid chewing tobacco mouth washes are useful to alleviate oral discomfort. In xerostomia caused by radiation treatment, pilocarpin is the drug preferred and can be consumed for a long period.

### **Tooth loss**

Edentulism is prevalent among older people all over the world<sup>[21]</sup> and is highly associated with socio-economic status. Epidemiological studies show that persons of low socio-economic status and individuals with little or no education are more likely to be edentulous than persons of high social class and of high levels of income and education.<sup>[9,22]</sup> Functional dentitions, as measured by presence of at least 20 natural teeth, are found to be most frequent among elderly of high socio-economic status in contrast to individuals of low socio-economic status.<sup>[22]</sup> Severe dental caries and periodontal disease are the major reasons for tooth extraction.<sup>[9,23-25]</sup> Tobacco use is also a risk factor in tooth loss,<sup>[23]</sup> particularly among people with a high consumption over many years.

### **Denture-related conditions**

Denture stomatitis is a common oral mucosal lesion of clinical importance in old-age populations. In many cases of denture stomatitis, colonization of yeast to the fitting surface of the prosthesis is observed. Other factors of stomatitis include allergic reaction to the denture base material or manifestations of systemic disease.<sup>[26]</sup> The prevalence of denture stomatitis correlates strongly to denture hygiene or to the amount of denture plaque.<sup>[27,28]</sup> Usage of denture at night,<sup>[27]</sup> neglect of denture soaking at night<sup>[28]</sup> and use of defective and unsuitable dentures<sup>[29]</sup> are also risk factors for denture stomatitis, as is tobacco and alcohol consumption.<sup>[30]</sup> Other major denture-related lesions include denture hyperplasia and traumatic ulcer; their prevalence rates in old-age denture wearers range from 4% to 26%.<sup>[27,30,31]</sup> Denture hyperplasia is particularly frequent in persons with ill-fitting dentures.<sup>[12]</sup> Both lesions have been observed more often among complete denture wearers than in persons wearing removable partial dentures.<sup>[29-31]</sup> Moreover, low education, tobacco and alcohol use and infrequent dental visits are factors associated with increased prevalence rate of denture-related lesions.<sup>[30]</sup>

### **Coronal dental caries and root surface caries**

High prevalence rates of coronal dental caries and root surface caries are found among old-age populations in several countries worldwide. In developing countries, data on dental caries among older people are scarce. A recent survey of 65–74-year-old in Madagascar<sup>[32]</sup> observed that the mean number of DMFT was 20.2;

untreated dental caries was high (DT  $\frac{1}{4}$  5.3) while the number of restored teeth was low (FT  $\frac{1}{4}$  0.4). In India, the mean number of decayed teeth has been reported 2.5 in a study.<sup>[33]</sup> The mean number of decayed and filled root surfaces in older people lies between 2.2 and 5.3 in developed countries<sup>[34-36]</sup> and in meta-analyses, the root caries increment has been estimated at 0.47 surfaces per year.<sup>[37]</sup> The Root caries index, i.e. the number of decayed and filled root surfaces with gingival recession over the number of decayed, filled, and sound root surfaces with recession,<sup>[38]</sup> was 5.4 in a study of older people in China.<sup>[39]</sup> In contrast, 12% of elderly subjects in India had exposed root surfaces, but none experienced root surface caries.<sup>[33]</sup> The available data worldwide show that dental caries is a major public health problem in older people and is closely linked to social and behavioral factors.<sup>[9,21]</sup> The pattern is mostly that persons of low income,<sup>[40]</sup> those who do not visit a dentist regularly,<sup>[40,41]</sup> do not brush their teeth frequently<sup>[41]</sup> and smoke,<sup>[40]</sup> tend to suffer more from coronal and root surface caries.

### Oral precancer and oral cancer

Age-specific rates for cancer of the oral cavity increase progressively with age, most cases occurring in the groups above 60 years. Oral cancer is more common in populations of less developed than of developed countries.<sup>[39]</sup> The prevalence of leukoplakia and lichen planus in older people ranges from 1.0% to 4.8% and 1.1% to 6.6%,<sup>[31,42-44]</sup> respectively. Leukoplakia is more frequent among men while lichen planus is associated with the female gender.<sup>[31,43]</sup> Tobacco use is the most important determinant of oral cancer and premalignant lesions,<sup>[45]</sup> including leukoplakia,<sup>[31,44]</sup> but heavy consumption of alcohol is also a significant factor in relation to these conditions.<sup>[44]</sup> Socio-economic status such as low levels of education<sup>[43]</sup> and income<sup>[46]</sup> is a risk factor for leukoplakia. In contrast, high fruit and vegetable intake are protective factors because of the high content of carotenoids and vitamin C.<sup>[47]</sup>

### Oral health care

Needs and demands for oral health care among the elderly vary across age groups, i.e. the old versus the very old. Oral health systems should effectively address factors that prevent or hinder the older population's access to and use of appropriate services. Some people, for example, experience financial hardship following retirement and the cost or perceived cost of dental treatment may deter them from visiting a dentist. Such barriers to oral health care should be reduced. Age-friendly and prevention-oriented third-party payment systems may contribute to effective use of oral health services amongst old age people. In developing countries, barriers to oral health care are particularly high as there is shortage of dental manpower and low priority is allocated to oral health by national health authorities. Affordable oral health care should be organized to ensure adequate early detection, prevention and treatment for all seniors as well as for other age groups. It remains a challenge

to health authorities in several developing countries to establish prevention-oriented oral health systems based on the primary health care approach. Community models for outreach service and provision of essential oral health care must be implemented urgently, particularly in low-income communities of Asia and Africa. In a number of developing countries community demonstration projects, based on socio-cultural conditions and focusing on the elderly, are supported or carried out jointly with the WHO.

### Provision of oral health care for the elderly

Elderly people should be provided free oro-dental care and they should be provided treatment on priority in all the health centers. Treatment should be free or on concession to this group of people. Government of Himachal Pradesh, under the project "Muskan,"<sup>[48]</sup> is providing free dentures to the elderly people above 65 years of age. Such type facility should be provided to the senior citizen throughout the country.

## RECOMMENDATIONS

Establishment of Continuing Dental Education programs on geriatric oral care; inclusion of a geriatric component in undergraduate and postgraduate curricula; initiation of a diploma, certificate and degree courses in geriatric dentistry; research on various aspects of ageing and age-related oral health problems; provision of preventive and curative treatment for various oral diseases to the elderly.<sup>[2]</sup>

## CONCLUSION

The proportion of older people continues to grow worldwide, especially in developing countries. This, along with an increase in the prevalence of oral disease and non-communicable diseases, will significantly challenge health and social policy planners. The WHO Oral Health Program encourages public health care administrators and decision-makers to design effective and affordable strategies and programs for better oral health and quality of life of the elderly, which are integrated into general health programs. Demonstration projects on oral disease control, health promotion and quality of life improvement should be initiated and evaluated systematically.

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