

# Oral Health Changes in Relation to Aging in Geriatric Population: A Review

<sup>1</sup>Rohma Yusuf, <sup>2</sup>Pradeep Tangade, <sup>3</sup>Yogesh Garg

## ABSTRACT

Oral health is an integral part of general health and affects physical and mental well-being and quality of life of elderly persons. Dental care for geriatric patients has been increasing nowadays. The treatment and diagnosis of the geriatric patient are challenging, as these patient have both systemic and oral problem. There are systemic diseases with associated oral manifestations to which the patient is unaware of the condition. It can be diagnosed or speculated by the clinician after examination and investigation. Edentulousness and paucity of prosthodontic rehabilitation prevent the frail elders from choosing food that they like and refute them the pleasure of eating, which is prerequisite for a feeling of well-being. Oral mucosal diseases and lesions are common in elderly people. Lichenoid mucosal lesions can also be caused by a variety of medications commonly prescribed in older patients. The greatest challenge is to provide affordable, accessible, and equitable health care to this population. Oral health is an essential part of general health and affects physical and mental well-being and quality of life of elderly persons. To provide quality oral healthcare to the elderly, it is significant to focus on education in geriatric dentistry. This article reviews the systemic and oral changes in elderly patient and needs to educate dental practitioners in providing geriatric dental care. The treatment and diagnosis of geriatric patient is challenging, as these patient have both systemic and oral problem.

**Keywords:** Aging, Dental caries, Elderly care, Frail elders, Geriatric population, Oral health.

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## INTRODUCTION

It was reported in 1994, that 34% of Canadians, of age 65 years and above, sought dental care in the last year. Although Alberta, the Yukon, and the Northwest territories offer seniors dental care as the year 1991 and 2001 and it has been estimated that by the year 2050, the number of elderly people would get advanced to about 324 million. Oral health is closely associated with several facets of patients general health and well being.<sup>1-3</sup>

Geriatric dentistry or gerodontics can also be defined as the delivery of dental care to an elderly group of people including the diagnosis, prevention, and treatment of problems related with normal aging and diseases associated with aging as part of an interdisciplinary team with other healthcare professionals. The government of India has classified, the people who are 60 years of age and above as elderly whereas in developed countries the age is 65 years. Approximately 600 million people globally are 60 years and above and are considered to be doubled by 2025. In the 1990s, the revolutionary research outcome has shown a link between oral and systemic health. In the present scenario, the dental needs of elderly patients have increased.<sup>4,5</sup>

In developing countries elders in need of oral care are mostly poor and disabled. Loss of teeth because of periodontitis is unusual among elderly people. Nonetheless, plaque continues to cause chronic marginal gingivitis, which is almost endemic in this population.<sup>6,7</sup> Although it is crucial for older adults to visit a dentist regularly, many do not visit a dentist for various reasons, such as their attitude, lack of transportation, financial hiccups, or incapability to make and keep appointments.<sup>8-10</sup>

It is unfortunate to state that many general, as well as specialized dentists, feel unprepared to manage this age group due to inadequate clinical training while in dental school. One of the studies found that the more restricted the extent of clinical experience with medically compromised patients, the more confined was the dentist's ability to conjure appropriate treatment plan for these patients. Moreover, age prejudice and negative perspective towards old aged patients by dentists are additional elements that could influence the quality of care provided to older adults.<sup>8,11</sup>

<sup>1</sup>Postgraduate Student, <sup>2</sup>HOD and Professor, <sup>3</sup>Senior Lecturer

<sup>1,2</sup>Department of Public Health Dentistry, Teerthankar Mahaveer Dental College and Research Centre, Moradabad, Uttar Pradesh, India

<sup>3</sup>Department of Public Health Dentistry, Surendera Dental College and Research Institute, Sri Ganganagar, Rajasthan, India

**Corresponding Author:** Rohma Yusuf, Postgraduate Student, Department of Public Health Dentistry, Teerthankar Mahaveer Dental College and Research Centre, Moradabad, Uttar Pradesh, India, e-mail: dr.rohmayusuf@gmail.com

India is a vast country with an abrupt increase in the elderly population between the approach through research based knowledge and technical skills delivered through a humane approach is most admissible when delivering oral health care to an elderly patient. It has become imperative to develop an appropriate curriculum to match with the registered prowess. It is equally crucial to unravel relevant methods of teaching, learning, and assessment of students that should be embraced to produce highly knowledgeable, skilled, and compassionate geriatric dentists in future ahead.<sup>12,13</sup> A fraternized part of their universal health care programs, Ontario and eight other provinces do not offer such service.<sup>14,15</sup>

Living arrangements of older adults in the United States are closely related to income, health status, and the availability of caregivers. The percentage of the population living in nursing homes also escalated dramatically with age, ranging from 1% for persons 65 to 74 years, to 5% for persons 75 to 84 years, to 19% for persons 85 and above. About 558,400 elderly population lives in assisted-living facilities. There has been an increase in last 15 years in the use of assisted-living facilities, board, and care homes, continuing care retirement communities, and other types of facilities supplementary to long-term care in a nursing home.<sup>16,17</sup>

The federal interagency forum on aging-related statistics projects reported that by the year 2030, the number of US adults in the age span of 65 years and above would reach up to 72 million, constituting nearly 20% of the total US population; this is an approximate doubling in number as compared to the year 2000. Frail adults are, hence, a mushrooming patient demographic for dental practitioners. Nowadays, increased numbers of older adults are retaining their natural teeth compared with previous cohorts. A survey conducted in 1999 to 2004 by National Health and Nutrition Examination Survey (NHANES), reported approximately 18% of adults aged 65 years or older with retained natural teeth to have untreated caries while a 2009 to 2012 NHANES found that 68% of these patients have periodontitis.<sup>18-20</sup>

### History and Need for Specialised Care for Geriatric Population In India

In 1972, World Health Organization (WHO) commission concluded that "education is inextricably interwoven with the health services system." This statement has a direct inference in the field of geriatric dentistry. Without personal experience of growing old and sufficient knowledge of the psychological, social, and economic outlook of becoming old, the dentist will be liable to fallacy, especially of omission.

A few unique facts regarding the elderly population in India include the following:

- The rate of growth of the elderly population has been reported to be faster than that of the general population.
- About 80% of the elderly population dwell in rural areas.
- Nine percent of the elderly live alone or with persons other than their immediate family members.
- Nearly 75% of the elderly are economically dependent, with little difference between the urban and rural elderly.

Among the elderly in the age group of 65 years and above, the DCI survey accounted for caries prevalence to be about 70% while the multi-centric oral health survey reported it to be 51 to 95% in various states. A higher prevalence (100%) of gingival bleeding in 65 to 74 years was reported from few states (Orissa, Rajasthan) in the multi-centric oral health survey.

The leading oral health problems of the elderly includes:

- Dental caries,
- Periodontal disease,
- Dry mouth (Xerostomia),
- Tooth wear, and
- Oral cancer

Recurrent caries around faulty dental fillings, cervical dental decay (around the neck of the tooth) or root caries are the most common dental caries in old age.

The prevalence of the periodontal disease increases with age, which indicates an accumulation and aggregation of disease over time rather than enhanced susceptibility. There is an increased probability of teeth to be extracted due to periodontal disease with age. The continuous effect of smoking and drinking on the development of soft tissue lesions is more evident in older adults, and the ubiquity of oral cancer increases with age.<sup>6,21</sup>

### Systemic Diseases and its Dental Relation

Most common diseases seen in elderly patients are cardiovascular diseases, diabetes, respiratory diseases, blood dyscrasias and other systemic diseases which have relation with dental manifestations. Cardiovascular diseases and uncontrolled diabetes may exaggerate periodontal inflammation. Periodontal disease is likely to develop as a result of a depressed immune system and is proposed as the 6th complication of diabetes. Elderly persons are more vulnerable to oral diseases because of the increase in these chronic health issues including physical and mental disabilities.<sup>4,22</sup>

Respiratory infections are usually caused by an oropharyngeal and periodontal microorganism and bacteria. Additionally, the microflora habitats in inadequate oral

hygiene resulting in the formation of dental plaque serves as a reservoir for respiratory pathogens.

Diabetes mellitus (DM) is another most common disease seen adult and elderly individuals in the 21st century. It has been proved and found that the patients suffering from types 1 and 2 DM have distinguished dental manifestations such as loss of periodontal attachment, gingival and periodontal abscess and early loss of teeth.<sup>4,23</sup>

### Potential Comorbidities

The health condition of adults older than 65 years can be very unpredictable, ranging from functional independence to frail or cognitively compromised. Primarily older persons have at least one chronic condition, and many have multiple health conditions. A 2015 report by the WHO enumerated conditions common to older age, including hearing loss, cataracts and refractive errors, back and neck pain and osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression, and dementia.<sup>18,24,25</sup>

### Dental Changes in Elder Patients

Geriatric patients are prone to wasting diseases of teeth such as attrition, abrasion, abfraction, and erosion. This is because the teeth are functional for a long period. Periodontal inflammation, loss of attachment, missing teeth, edentulism, ill-fitting dentures, oral ulcerations, xerostomia, and oral carcinomas are some of the age-related changes. Further, root caries is other most common caries found in elderly patients.<sup>4,26</sup>

### HABITS AND ORAL IMPLICATIONS

An elderly patient had habits such as smoking, tobacco, pan and beetle nut chewing which leads to the formation of precancerous or cancerous lesions. Thus, combining both systemic and oral problems the immunity declines in elderly people. Elderly people in rural areas have a habit of tobacco and betel nut chewing as compared to urban population necessitating the need of integrating primary health care with oral care in rural population<sup>4,27</sup>

### Goal of Geriatric Dentistry

- To maintain the oral health of individuals.
- To maintain ideal health and function of the masticatory system by establishing adequate preventive measures.

### Objectives of Geriatric Dentistry

- To recognize and relieve the difficulties of elderly people.

- Restoration and preservation of function for maintaining a normal life in elderly patients.

### Preventive Measures for Dental Diseases

Oral health care provider should educate patients regarding oral diseases and its prevention. The five golden rules for preventive dental diseases in geriatric patients are given below:

- A well-balanced diet is a key to oral health and a body that is strong and free from diseases because nutrients available systemically will impact overall development, growth, and maintenance of tooth structure, connective tissue, alveolar bone, and oral mucosa.
- Should not eat sweet or sticky foods between meals because high sugar diet has often been associated with caries so such intake should be restricted.
- Regular brushing after every meal or at least every meal at night which helps to keep teeth free of plaque and fight decay.
- Choose a right toothbrush that fits comfortably in hand and is easy to control. Massage your gums with your fingers after brushing and gently brush your tongue too.
- Visit your dentist regularly.<sup>4,28</sup>

### Guidelines for Local Public Health Programs

Until 1974, there were no regional rules and regulations to identify the local needs in Ontario. In 1974, the Task Force on Community Dental Services advocated that more comprehensive services be provided to specific adult groups such as geriatric and handicapped people. In 1982, a revised draft guideline, under the proposed Health Protection and Promotion Act at that time, was circulated for the remark. The draft guideline would have demanded health units to provide screening, referral and follow-up, clinical preventive measures, dental health education, and advisory services to seniors' facilities and all seniors. However, by the time the guideline was published, the proposed services were made available to residents of collective living centers, such as homes for the aged, chronic care hospitals and chronic-bed residents in general hospitals.<sup>14,29,30</sup>

### Strategies Towards Improving Oral Health of Older People

Globally, important mechanisms for better oral health would relate to strengthening oral health policy development; national capacity building within oral health care for the underserved; education and training for service and care for the elderly, and research for oral health. However, the challenges vary from country to country

and region to region; the differences are particularly notable between developed and developing countries.

### Oral Health Policy

As accentuated in the World Oral Health report 2003, WHO sees oral health as innate to general health and as a determinant for the quality of life. The interrelationship between oral health and general health is particularly strikingly noticeable among older people primarily because many oral diseases have risk elements in common with chronic diseases. Oral health planners and administrators are persuaded to use the common risk factors approach to coalesce interventions for oral health among older adults into general health programmes. An advantage of this approach is the focus on improving health conditions for the whole population and also to the high-risk groups such as older adults, thereby mitigating inequities.<sup>14,31</sup>

### Approaches to Improving Oral Health and Access to Dental Care

Improved oral health will lead to enhanced quality of life through increased personal dignity, improved diet, better appearance, greater cleanliness, and greater comfort or relief from pain. But meeting the oral health needs of frail adults necessitates advanced perspective to plan for dental treatment that takes into account the special needs of the elderly. Berg Garcia and Berkey have described a process called "spectrum of care treatment planning." This model highlights imperative steps in clinical decision making for both patient and dentist. This process addresses four domains of subjective and objective needs: function, symptoms, pathology, and esthetics.

The next step in treatment planning is the objective evaluation of the patient by the dentist. Many older adults have a cumbersome arrangement of missing teeth along with fixed and removable prosthodontic dentures. The usefulness of the few remaining teeth on the patient's ability to chew and to speak must be analyzed carefully, and the alternative treatment possibilities explored fully.

After recording the medical and dental history, the dentist must begin to plan treatment options that are often expansive. When planning oral care for older adults, the dentist must seek the highest level of care that is appropriate and necessary to maintain the individual patient's oral and general health.<sup>16,32</sup>

### Use of Advanced Technology in Teaching and Learning

Information and communication technology (ICT) has a two-way relationship with teaching and learning; both

can influence and stimulate the growth of each other. Advancement of ICT has transfigured the learning woodcraft for students as there is fast relaying of information. Synergistic multimedia, also known as "rich media" (which combine text, illustrations, videos, etc. with feedback), is a very powerful aid for teaching and learning.

Virtual learning environments (VLE) or virtual classrooms empower a learner to communicate with other learners, learn by doing, and amalgamate by learning exercises. This has to lead to the modification from lecturing and telling (sage on the stage) to promoting and guiding (guide on the side). One of the most effective methods which can be utilized for a better distant teaching is Videoconferencing, especially where there is a scarcity of teachers. Webcasting or Internet broadcasting is another useful tool in teaching/learning. The advantage is that at present it is available globally, 24/7.<sup>12,33-35</sup>

### Barriers and Possibilities for Development of Geriatric Dentistry Education

The crucial measures which are required to promote geriatric dentistry education are to change the outlook of academicians, students, community members, and policymakers. Progression can only be made when the importance of geriatric dentistry is perceived and personified into the dental syllabus. Geriatric dentistry is an interdisciplinary specialty and can also be developed as a specialized branch of dentistry. Imparting knowledge of geriatric dentistry needs to start from the first year of the dental curriculum and be included in all the succeeding years.

Proficiency required of a geriatric dentist need to be explicated, and the suitable way of teaching and learning need to be carefully chosen to upskill the geriatric dentists of the future. Apart from knowledge and clinical skills, a geriatric dentist needs to have a caring nature towards elderly, prowess in behavioral management, and additional knowledge of medicine and pharmacology to have an in-depth understanding in chronic illnesses of old age, their pharmacotherapy, adverse drug reactions, and drug interactions. Advanced knowledge and skills are required in the field of restorative dentistry, prosthodontics, and implant-supported rehabilitation to improve the mutilated dental condition in elderly individuals. By combining Information and communication technologies newer courses in geriatric dentistry can be initiated.<sup>12,36</sup>

### CONCLUSION

It has become important to merge geriatric dentistry in general practice, to allow dentists to provide proper dental health care to the elderly population based on

their need. Good health is achieved by the assimilation of a healthy diet, and this further helps in maintaining the health of oral hard (teeth) and soft tissues. By including geriatric dental care at both the undergraduate and postgraduate levels and increasing the number of dentists skilled in geriatric dental and oral health in future, dental education can help close the chasm in geriatric dental care that is present today.

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