

Moral and professional responsibility of oral physician toward geriatric patient with interdisciplinary management - The time to act is now!

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ABSTRACT

Mouth is the mirror of overall health. With advancements in oral health promotion and preventive measures instituted in developed countries, more people retain their natural teeth into their old age as compared to half a century ago. The effect of aging on oral health includes effect on oral mucosa, lips, teeth and other associated structures, and their functional activity leading to impairment of speech, mastication, swallowing and pain leading to anxiety and depression. Oral tissues are not limited to the teeth and supporting structures (periodontium) but also include salivary glands, temporomandibular joint, orofacial/mastication muscles, oropharyngeal mucosa, and oral sensory/motor nerve systems. In India, the second most populous country in the world, there is a rapidly growing population of older adults and there are 70 million elderly people over 60 years of age. Geriatric health problems with respect to the quality of life often remain neglected. Oral health care for an increasingly large segment of elderly people will be a fact of life for dentists everywhere. Oral health can be both a benchmark for and a determinant of the quality of life rather than the length of life span. Older adults are more susceptible to oral conditions or diseases due to an increase in chronic conditions and physical/mental disabilities. Thus, a careful initial interview ensuring that the dentist is familiar with the patient's health history, followed by a thorough oral examination plays a very important role. In this paper, we briefly review the age-related oral changes occurring in geriatric patients and the role of oral physician in imparting a healthy life to the elderly.

Key Words: Geriatric dentistry, geriatric patients, oral health, oral physician

INTRODUCTION

Geriatric dentistry is the branch of dentistry that emphasizes dental care for the elderly population and focuses upon patients with chronic physiological, physical and/or psychological changes or morbid conditions/diseases.^[1] The proportion of the elderly in the world population is expected to increase rapidly from 10.0% in 2000 to 15.0% in 2025 and 21.1% in 2050.^[2] It has been estimated that 70% of the world's elderly population are and will be in developing countries.^[2,3]

The absolute number of the elderly in India is projected to reach 137 million by the year 2021, a drastic increase from 81 million in 2002. The growth in the aging population in India has been faster than in other

developing countries. In 1947, when India became independent of British rule, life expectancy wavered around 32 years. The life expectancy has nearly doubled to 63 years in 2000, with the projected increase to 74 years by 2045–2050.^[1,2] While extended life expectancy is a great achievement, it does not mean that extra years will be healthy.

The World Health Organization (WHO) discussion paper on health and aging indicated, “we can afford to get old if countries, regions and international organizations enact ‘active ageing’ policies and

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programmers that enhance the health, independence, and productivity of older women and men. The time to plan and to act is now”.[1-3]

The dental management of the elderly population is different from that of the general population because special considerations for age-related physiological changes, complications of chronic condition/therapy, increased incidence of physical/mental disabilities, and social concerns are required.[1-5] It is difficult to delineate where the normal aging process ends and the disease process begins.

Therefore, special knowledge, attitudes, and skills are necessary to provide oral health care to the elderly. Some of the gerodontic problems are believed to be due to physiological tissue changes and some are the basic diseases and disorders intensified by age changes. In this review, we briefly discuss the age-related changes affecting the oral cavity and its interdisciplinary approaches for treatment and prevention of disease and disability in older people.

AGE CHANGES AFFECTING STRUCTURES IN THE ORAL CAVITY

Wasting diseases of teeth usually increase with advancing age. Losses of tooth translucency and surface details (e.g. perikymata and imbrication lines) are common changes during aging.[6,7] The dental pulp becomes smaller because of secondary dentin and pulp stone formation, and sometimes root canals become totally sclerosed.[6-8] Prevalence of periodontal problems is more. As gingival recession increases, the prevalence of root surface caries increases in the dentate elderly population.[6,7,9]

The oral mucosa becomes thin, smooth, dry and susceptible to injury.[7] Oral mucosal immunity undergoes age-related changes. Wound healing and regeneration of tissue may be delayed.[6] The tongue loses the filiform papillae and appears smooth. Mucosal atrophy results due to dietary deficiencies. Taste is also apparently affected.[6,7,10] Salivary secretions decrease, and with progressing age, the mandible moves forward, producing an edge-to-edge occlusion of incisors and accelerates their attrition. Changes in facial profile occur with tooth extractions and associated atrophy of alveolar bone. The mandible resorption and muscles of mastication undergo atrophy as do the associated muscular processes of bone.[6,7,10] Arthritic degeneration may occur in temporomandibular joint (TMJ). The chemosensory functions of smell and taste decrease with age. Even the oral motor functions that require

coordination of intricate neuromuscular activities are often disturbed in the elderly.[6]

Relationship between oral and general health in the geriatric patients

Oral health has a critical impact on the functional, psychological, and economic aspects of the overall quality of life. The oral cavity is a portal of entry for microbial infections. Bacteria from the oral flora have been recovered from infection sites in other organs of patients with endocarditis or aspiration pneumonia. Oral infection-induced periodontal disease has also been associated as a risk factor for several cardiovascular diseases because cytokines elicited by oral inflammation might mediate the initiation/progression of these diseases.[7,11-15]

Some studies have found periodontal microbes in arterial plaques associated with the narrowing of vessels, the beginning of atherosclerosis, and even the initiation of blood clots. Chronically inflamed gingival tissues can increase the amount of C-reactive protein found in the blood, an indicator of systemic inflammation. This compound is also elevated in patients with cardiovascular disease. Another substance that is elevated amidst the chronic inflammatory process of periodontitis is fibrinogen. While a necessity for hemostasis, this mechanism can become problematic within blood vessels when a thrombus, or localized clot, develops and occludes a blood vessel. Depending on the vessel involved, a stroke or myocardial infarction can develop. Patients with chronic periodontitis also exhibit increased levels of tumor necrosis factor-alpha that can cause the liver to increase the production of triglycerides and decrease the amount of high-density lipoprotein, the beneficial cholesterol. The elevation of one known risk factor and the lowering of a beneficial cardioprotective compound can increase the risk of the development of cardiovascular disease.[6,7,10,12,16]

On the other hand, many systemic diseases and conditions have oral manifestations, which may be the initial sign of a number of clinical diseases.

Diseases common in the elderly

Elderly patients experience additional risk factors for oral diseases and conditions. Many older adults have pigmented (varices, lingual varicosities, melanotic macules) and benign soft tissue (fibromas, fordyce’s granules) and hard tissue conditions (exostoses, tori).[6] Tongue may be fissured, coated and enlarged (especially in edentulous individuals).[6] Adverse effects of drugs are common among the elderly, resulting in drug-associated oral diseases/conditions

like xerostomia, lichenoid reactions and gingival hyperplasia.^[7,10,17,18] The oral cavity of elderly patients is also vulnerable to oral ulcerations, fungal infections, viral infections (e.g., Herpes simplex and Herpes zoster), autoimmune-related disorders (e.g., erosive lichen planus, pemphigus vulgaris, pemphigoid), and burning mouth syndrome due to immune dysfunction, nutritional deficiencies, chronic conditions, and cognitive alterations [Table 1].^[6,7,10]

The incidence of oral cancers also increases with advancing age. Typical sites of oral malignancy in elderly include tongue, lips, buccal mucosa, floor of the mouth and posterior oropharynx. Approximately 90% of all oral cancers are squamous cell carcinomas, while the remaining 10% are salivary, bone or lymphoid cancers.^[6,19,20]

Patients undergoing long-term bisphosphonate treatment for metabolic bone disease or osteoporosis might be at risk for developing osteonecrosis of the jaw (called bisphosphonate-related osteonecrosis of the jaw).^[7,10,21,22] Diabetes can lead to advanced periodontal disease due to gingival microangiopathy, altered polymorphonuclear leukocyte function and increased collagen breakdown.^[1,6,23] Patients with chronic gastrointestinal problems may develop teeth erosion.^[1]

Arthritis affects approximately 49% of individuals of age 65 years and older. Osteoarthritis is the most common form of the disease, whereas rheumatoid arthritis mainly affects the females. Both these arthritic conditions may affect TMJ, resulting in degenerative changes in the condyle.^[6]

Common medical conditions affecting smell and taste in the elderly can be neurologic (Alzheimer’s disease, Parkinson’s disease, multiple sclerosis), endocrine (diabetes) and gastrointestinal (reflux, ulcers).^[6] More than one-third of older adults in the general population complain of dysphagia due to medical conditions like neuromuscular disorders or by environmental effects of certain conditions like smoking. Surgery for head and neck cancer can also lead to dysphagia. Epidemiologic surveys suggest that oral-facial pain (mainly neuropathic pain) is a significant problem in the elderly.^[1,6]

ORAL PHYSICIAN’S GOAL

As per the WHO objectives, one of the global goals for the oral health is that at the age of 65 and above, there should be 25% reduction in the present level of edentulous status. The presence of 20 teeth is an oral health goal of the WHO. So, the role of a dental physician in geriatric dentistry becomes more purposeful since the life expectancy of an average

Table 1: Summary of most common oral disorders in elderly patients with suggested treatment

Disease	Treatment considerations
Oral cancer	Surgery, chemotherapy, radiation therapy
Traumatic lesions	Oral rinses (viscous lidocaine HCl 2%, diphenhydramine elixir 12.5 mg/5 ml, dyclonine HCl 1%, sucralfate), systemic medications (penicillin, amoxicillin, erythromycin 500 mg qid)
Candidiasis	Topical agents (clotrimazole troches 10 mg 5 times daily, nystatin oral suspension 500,000 units, nystatin pastilles 100,000 units), systemic agents (fluconazole 100 mg, itraconazole oral suspension 10 mg/ml, ketoconazole 200–400 mg daily)
Xerostomia	Preventive therapy (topical fluorides, maintenance oral hygiene), salivary substitutes (increased intake of water, oral rinses and gels, use of artificial saliva), salivary stimulants (chewing sugarless gums or mints, electrical stimulation, use of drugs like pilocarpine hydrochloride, bromhexidine and cevimeline)
Oral vesiculobullous and erosive diseases	Pain control measures: 2% viscous lidocaine (swish and spit out 5 ml, 4–5 times a day), liquid diphenhydramine (swish and spit out 5 ml, 4–5 times a day), combination of viscous lidocaine, diphenhydramine, and a covering agent (such as kaopectate or Maalox) in 1:1:1 ratio, 0.1% diclonine hydrochloride benzydamine, systemic analgesia Supportive care (hydration, ice chips or popsicles, soft bland diet, antipyretics such as ibuprofen, as needed) Systemic medications (prednisolone 5 mg dose or maintenance dose, azathioprine 50 mg 1–2 tabs)
Periodontal diseases	Daily tooth brushing and flossing after every meal, electric toothbrushes, floss holders, pulsed jet water irrigators, 0.12% chlorhexidine antimicrobial rinses, systemic antimicrobial therapy (metronidazole, tetracycline, clindamycin), surgical periodontal therapy
Edentulousness	Prevention of total tooth loss is recommended, fabrication of prostheses with adequate retention, occlusion, esthetics and margin extensions, endosseous dentoalveolar implants, regular assessments to reduce the risks of denture stomatitis, traumatic ulcers or hyperplastic tissue reactions
Neuropathic pain like burning mouth syndrome	Antidepressants (amitriptyline, trazodone, paroxetine), anticonvulsants (conazepam, gabapentin), C-fiber nociceptor desensitizer (capsaicin), antioxidant (alpha-lipoic acid), alternative therapies (electroconvulsive therapy, cognitive behavioral therapy, mind–body interactions, dietary and lifestyle changes)

individual has increased considerably over a period of time.^[1,2,7,10]

The assessment of geriatric patients is a multidimensional, multidisciplinary diagnostic instrument designed to collect data on the medical, psychosocial and functional capabilities and limitations of elderly patients. Optimal treatment planning for older adults requires an understanding of the overall health of the patient and the relationship between any systemic problem and the patient's oral health.^[1,6,11,12]

Hypertensive patients should be treated in a reclined position. The incidence of orthostatic hypotension can be minimized by raising the chair gradually and allowing the patient to remain in an upright seated position for some time before attempting to stand.^[24-26]

In patients with congestive heart failure and coronary artery diseases, stress reduction protocol should be followed. Within the dental office, all staff members must be trained in cardiopulmonary resuscitation.^[7,10,24-26]

Patients who have angina should be assessed to determine the severity of their disease. Patients should not undergo elective outpatient dental care until at least 6 months after a myocardial infarction (MI) because of the increased risk for angina, arrhythmias, or another MI while in the dental chair. A patient with a known history of angina that is not relieved by nitroglycerin should be sent to the emergency department.^[7,10,25,26]

Prophylaxis for infective endocarditis is essential if the elderly patient has previous endocarditis, a prosthetic valve or implant or valvular heart disease. The standard prophylaxis for dental procedures is to give 2 g amoxicillin 1 hour prior to the procedure, or if the patient is allergic to penicillin, 600 mg clindamycin may be used.^[1,6,10,24,25]

Patients on aspirin may have reduced platelet aggregation, resulting in possible excessive bleeding during dental surgery. Antibiotics (long term: 7 days or more) and nonsteroidal anti-inflammatory drugs (NSAIDs) may result in excessive bleeding. As some patients may be on oral anticoagulants (OACs), the international normalized ratio (INR) must be optimal before a dental procedure is carried out. Warfarin or other anticoagulants may be stopped 72 hours before the procedure, keeping the INR < 1.5. The drug may be restarted after the procedure, as soon as the bleeding is controlled. In high-risk cases, heparin may be given 48 hours before the procedure, stopping it 6 hours before surgery and reinstating it as soon as possible

after surgery. Low-molecular-weight heparins have an advantage that monitoring of coagulation parameters (activated partial thromboplastin time or a PTT) is not needed, but are costlier than unfractionated heparin. Heparin may be stopped once the dose of OAC is adequate for an appropriate target INR.^[1,7,10,27,28]

Elderly patients with prosthetic joints should be administered antibiotic premedication before an invasive dental procedure. Special attention should be given to these patients with Alzheimer's disease because of failure of mental function combined with continued mobility.^[1,7,10,29]

Cerebrovascular accident (CVA) or stroke is a major cause of disability among persons older than 65 years of age. Muscle weakness often follows a stroke and may affect the muscles in and around the oral cavity. Therefore, it is advised to perform dental procedures at least for 6 months after a stroke.^[1,6,9,15] Special consideration must be given to patients with aphasia.^[10] Use of simple short instructions, communication with writing or visual cues may help in dealing with the problem.^[1,10]

Any mucosal lesion that persists for 3–4 weeks despite all attempts to remove suspected etiologies (e.g., ill-fitting denture flange) must be thoroughly investigated to determine a diagnosis (e.g., biopsy). Regularly scheduled periodic head, neck, and oral examinations are required to diagnose oral mucosal diseases at an early stage and to intervene with appropriate therapy. Importantly, even edentulous older adults require at least an annual head, neck, and oral examination to evaluate for benign and malignant lesions.

Patients who have been diagnosed with any type of cancer should have a comprehensive clinical and radiographic dental examination completed as far in advance as possible of any surgical and/or chemotherapeutic treatments. Reconstructive surgery may not be successful in restoring the patient to presurgical form and function. Physical therapy may be required to help patients adjust to an oral and maxillofacial environment that functions in a vastly different fashion.^[17,18]

Oncologists and physicians must be cognizant that optimal oral health will minimize the potentially oral complications like mucositis, salivary gland dysfunction, osteoradionecrosis, etc. that may develop after surgery, radiotherapy, and chemotherapy. Further, many patients do not receive routine preventive dental treatment and should be referred to a dentist prior

to the initiation of treatment.^[6,30-32] It is imperative to extract teeth that cannot be restored or those with periodontal problems that cannot be rectified.

Dental emergencies can arise at any point during cancer therapy. The patient's oncologist should be consulted prior to the initiation of any emergency dental treatment while the patient is receiving chemotherapy or is in the midst of radiotherapy. Laboratory values for platelets and white blood cells should be determined to evaluate if the values are of an appropriate range for hemostasis and if white blood cells are present in sufficient levels to successfully mount a defense against pathogenic organisms. Extracting teeth after oral radiotherapy can cause osteoradionecrosis. Prostheses with any rough surfaces should be smoothed. Those that are a poor fit against the supporting tissues should be relined or remade.^[1,6,31,32]

Dental treatment plan should have the goal of achieving optimal oral health. Regardless of functional status, the elimination of acute dental infection and pain should be achieved for all elderly patients. Cosmetic and esthetic dental services offers older generation an opportunity to improve their smiles, enhance self-esteem, and improve the quality of life in their later years. Many older adults have difficulty achieving effective daily plaque control. Various bristle and handle designs are available in either manual or powered (electric or sonic) brushes for such patients. For patients with difficulty holding a toothbrush because of arthritis or stroke, devices are available to facilitate brushing. Wider floss, Teflon-coated floss, floss holders, proximal brushes and even electric flossers are available.^[6,7,10] For patients with gingivitis or gingival overgrowth secondary to medication use, chlorhexidine may be used. Older adults at high risk for caries can be placed on a course of chlorhexidine as an adjunct to therapy once in every 3-6 months.^[1,6,7,10]

The presence of fluoride in toothpastes reduces the incidence of dental caries and a reduction is seen with every 500 ppm increase in concentration of fluoride from 1000 to 2500 ppm.^[10] In patients with severe caries, fluoride incorporation in glass ionomers used for Atraumatic Restorative Treatment (ART) is a useful secondary preventive measure to reduce recurrent dental caries.^[7,10]

Dentists should be aware of advances in dental materials like hybrid/resin ionomer and new treatment modalities like dental implants (in patients with enough bone support) for diseases commonly seen in geriatric patients.^[7,10]

Periodontal disease resolution can be obtained with appropriate interventional therapy and regular oral hygiene. Patients with bleeding disorders, extensive cardiopulmonary problems, and immunosuppression may be poor candidates for periodontal surgery; local methods (extensive scaling/root planning), topical drugs (antimicrobial and anti-inflammatory agents), and occasionally systemic drugs (antimicrobial and anti-inflammatory agents) are preferred [Table 1].^[1,16,33,34]

Xerostomic elderly patients can be managed by salivary substitutes, lubricant mouth wash (2% methylcellulose) and frequent sips of water as needed. Salivary stimulants, chlorhexidine rinse, fluoride toothpastes or gels and fluoride varnishes on root surfaces used separately, sequentially or in combination, can negate the cariogenic potential of xerostomia. Treatment planning for patients with long-term xerostomia should also include frequent evaluation for candidiasis. Although nystatin oral suspension is frequently prescribed, it contains nearly 50% sugar and is not recommended for patients who have a natural dentition and who would need to use this medication repeatedly [Table 1].^[1,6,7,10,35]

Oral disease prevention is still the central focus for the elderly population as for other patient populations. Regardless of dentate status, it is recommended that the elderly make dental visits at least every 6 months for clinical re-evaluation and depending upon the ability to perform oral hygiene for prophylaxis. Those with reduced ability to perform oral self-care should be seen more frequently for prophylaxis. Since denture-related and other oral mucosa lesions are common in the elderly, edentulous patients should be periodically evaluated by dental professionals.^[1,6,7,11,12]

Neurological and psychiatric examinations comprise a significant portion of the geriatric assessment. The dentist should be concerned with the emotional and psychological state of the patient, for it is an essential component of treatment, and the success or failure of the treatment often depends on the emotional state of the patient. Hence, two types of abilities are required for success in this particular field: the ability to produce a good dental service and the ability to create an appreciation for that service.^[36]

Nutrition is a prime concern for the optimal health of older persons. Nutrition, aging and health form an inseparable triad. Nutrition modulates aging and also contributes to the development and progression of degenerative diseases and disorders that are associated with aging. The basal metabolic rate (BMR) decreases by about 20% between the ages of 20 and 90 years.

Impaired gastric motility and emptying are observed with aging. A decline in mucosal prostaglandin synthesis and secretion of bicarbonate, sodium ion leads to increased risk of NSAID gastropathy.^[1,37]

Older patients should be given advice and assistance in support of their continued efforts to adequately maintain good oral hygiene. It is crucial to offer oral health education in a manner that respects the patient's autonomy and is not embarrassing. Dietary modifications should be made with regard to sugar intake. Patients should be asked to avoid carbohydrate-rich diet and encouraged to drink more water. Patients are often unaware that antacids (mouth dissolving tablets) contain high amount of sugars. Xylitol (sugar substitute) has shown reduction in caries rate. As compared to 51–70 years, for elderly >70 years of age, there is more requirement of calcium, magnesium, vitamin D, fluoride, thiamine, niacin, folate, vitamin B, pantothenic acid, biotin, choline, vitamin C, vitamin E and less of phosphorus, riboflavin, vitamin B and selenium.^[1,37]

Interdisciplinary geriatric health care team

As more and more physicians and other professionals understand the links between oral and systemic health and quality of life, they will be prepared to refer patients and to work with dental professionals during treatment planning to identify and clarify systemic issues that may affect the delivery of treatment.^[1] Interdisciplinary and coordinated efforts of medical, dental, nursing staff, social workers, occupational therapist and paramedical staff with use of mobile and portable dental care unit are required for home-bound and hospitalized patients.^[1]

CONCLUSION

The geriatric patient may face special health care needs and challenges. The major emphasis or goal of the oral health team, when caring for older patients, is to show emotional and physical support by giving ample time to their hearing. Given that people are living longer and the proportion of older adults in our society is higher, meeting these challenges requires a clear understanding of the health needs of older adults, innovative planning to develop programs, systems and structures which will support the health and welfare of the aging population, and substantial reforms and policies at global, national, and local levels. Geriatric dental education should be taught both at the predoctoral and postdoctoral levels to oral health providers, and other health care professionals such as physicians and nurses, and to caregivers and patients.

Today, oral changes occurring during aging are not clearly understood. Many treatment modalities for geriatric patients are still experimental.

Apart from a good oral physician, this age group requires a good human being and a trustworthy friend, and we should play the dual role of both a doctor and a friend. The easiest and the most effective way of treating geriatric population is when we can mix professional treatment with humane touch.

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