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# The Aged Mouth: An Insight

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## Abstract

Oral health and function is frequently distorted in the elderly. WHO refers to old age as a period when impairment of physical conditions becomes frequently apparent. As oral physicians, an awareness of the extreme diversity and multifarious presentations of disorders that may affect the aged is essential. This paper intends to review some of the myriad oral conditions that afflict the old. It also intends to highlight the need for exercising caution in dealing with the geriatric population.

## INTRODUCTION

Old age is considered to be the beautiful sunset of life. The clan of old people is our prestigious and much desired treasure. They not only govern our cultural fabric due to the values they instill but also form the infrastructure of our lives.

The escalating proportion of elderly among the populations of developed countries is however presenting the aged and their societies with remarkable challenges.<sup>1,2</sup> Though rising longevity is a constructive development, it has also led to a rise in age-related ailments and disabilities.<sup>1</sup> Extensive exposure to the factors associated with irreversible morbid conditions and chronic diseases goes hand in hand with a long life.<sup>2</sup>

## REVIEW

The oral cavity reflects the generalized systemic state of the entire body. Owing to age-related systemic diseases and functional changes, the elderly are more vulnerable to oral disorders. Oral health assessment should be an indispensable part of the physical examination, and dentistry is necessary to be eligible for geriatric patient care.<sup>3,4</sup> Geriatric dentistry refers to the branch of dentistry that lays stress on dental care for the aged with a special attention on patients suffering from chronic diseases and morbid ailments in addition to other physiological, physical and/or psychological changes.<sup>4</sup>

Gerontologists divide the geriatric population into three age groups: the young-old (65-74 years), the old (75-84 years) and the old-old (85 years and above).<sup>5</sup> Depending on the degree of disability, the aged have also been classified into

four categories as: Well elderly (One or two minor chronic medical conditions; independent living), Frail elderly (Simultaneous minor and major chronic, debilitating medical conditions, with drugs; self-sufficient living with support, a minority institutionalized), Functionally dependent elderly (Same as category II, but patient is incapacitated to the extent that independence is not possible; homebound or institutionalized) and Severely disabled, medically compromised elderly (Health status depreciated to the extent of requiring steady maintenance; sanatorium or skilled nursing facility).<sup>6</sup>

Though several theories have been put forth to elucidate the mechanism of aging, it appears that it is the consequence of various autonomous events involving random genetic change, genetically programmed senescence, and environmental injury.<sup>7</sup>

Elderly comprise about 15% of the population.<sup>8</sup> About 75% are gripped by one or more chronic illness.<sup>8</sup> This deteriorated state is further convoluted by uncharacteristic symptomatology, polypharmacy and anomalous reactivity to varied drugs.<sup>8</sup> A less florid and dramatic manner of disease presentation may be eminent in the aged.<sup>8</sup> The multifarious presentation and extreme diversity of various disorders among the elderly necessitates a scrupulous oral and dental assessment in addition to a thorough, multidisciplinary evaluation of the patient prior to diagnosis and treatment planning.

A detailed health history and a comprehensive physical assessment constitute the medical evaluation of the geriatric patient by the oral physician.<sup>5</sup> The elderly may try to control

the medical information they divulge.<sup>5</sup> Few may avoid dental care in the erroneous belief that the ultimate loss of teeth is unavoidable.<sup>5</sup> Arthritis, hypertension, heart disease, sinus diseases and diabetes mellitus constitute the most frequent chronic diseases in the elderly.<sup>9</sup> Cardiac diseases, cancers, cerebrovascular and pulmonary diseases are the most common causes of death in individuals greater than 65 years of age.<sup>5,9</sup> Hearing, visual and orthopedic impairments as well as speech disorders are among the other prevalent physical ailments that affect the old.<sup>8,9</sup> The elderly also experience sensory impairments like gustatory and olfactory dysfunction, in addition to oral motor problems together with difficulty in mastication and deglutition.<sup>9</sup> Mental and emotional disorders are also known to affect the aged, and dementia from reasons such as Alzheimer's disease turns out to be exceedingly common with advancing age.<sup>8</sup> Dementia or "senile dementia" or "organic brain syndrome" refers to a clinical state typified by a worsening in intellect, memory, and personality from a previously normal intellectual level in the presence of an otherwise normal consciousness.<sup>5</sup> "Benign senescent forgetfulness" reflects a mild impairment and represents a mild form of memory dysfunction.<sup>5</sup> An acute confusional state may arise from left ventricular failure, urinary tract or respiratory infections, or minor cerebrovascular accidents.<sup>8</sup> Diabetes mellitus, hypothyroidism, carcinomatosis, anemia, uremia or drug therapy may lead to a chronic confusional state.<sup>8</sup> In addition to anxiety, damaged cognitive function and feelings of resentment, archetypal psychiatric symptoms in the old include depression, lack of enthusiasm, apathy and chronic fatigue.<sup>1</sup> Frequently apparent in the aged is the 'Diogenes syndrome' that unites domestic squalor, hoarding or collecting, self-neglect, social withdrawal and lack of concern for the personal living environment.<sup>1</sup> Visual impairments, drug effects, transient cerebral ischaemic attacks, Parkinsonism, postural hypotension, cardiac dysrhythmias or epilepsy frequently lead to ataxia, syncope and falls.<sup>8</sup> Poverty, apathy, mental disease or dental defects may result in defective nutrition.<sup>8</sup> Temperature regulation may also be deranged.<sup>8</sup> Drug reactions and interactions are not uncommon as they constitute 10% of admittance to geriatric units.<sup>8</sup> Urinary retention or incontinence, prostatic hypertrophy and cancer are among the other diseases affecting the elderly.<sup>8</sup>

A strident decrease in skin thickness occurs at about 60 years of age.<sup>10</sup> Loss of subcutaneous fat accentuates the dermal alterations and renders a folded, lined, wrinkled and lax

appearance to the face.<sup>10</sup>

Oral health and function is usually distorted in the elderly.<sup>9</sup> Dental, periodontal, and oral mucosal diseases, salivary dysfunction as well as impaired chewing, tasting and swallowing have a harmful effect on oral health in older adults.<sup>9,11</sup> Pathogens arising from oral diseases can be blood borne or aspirated into the lungs.<sup>9</sup> These may lead to immediate systemic complications or may be allied with long term problems.<sup>9</sup>

Alterations in the oral mucosa are most noticeable after age 70.<sup>12</sup> The tissues exhibit a satiny and gleaming stretched appearance.<sup>12</sup> As epithelium thins, the tissue is more prone to injury and hence such individuals tend to shun hard foods and subsequently often have a protein deficiency, permitting still further injury.<sup>12</sup> Elderly individuals may exhibit delayed wound healing and regeneration of tissues owing to concurrent nutritional and vascular deficiencies coupled with deterioration of immune system with advancing age.<sup>9</sup>

Yellowish brown discoloration and loss of enamel due to attrition, abrasion and erosion constitute the external tooth changes.<sup>8,9</sup> A steady reduction in cusp height with a constant flattening of the occlusal plane occurs with proceeding age.<sup>10</sup> With age, the enamel exhibits less permeability and becomes more brittle.<sup>10</sup> The pulp is stimulated by dentinal exposure to lay down 'secondary' or 'adventitious' dentin resulting in dentinal sclerosis.<sup>10</sup> The age-associated decrease in tooth sensitivity can be partly attributed to the ample secondary dentin formation.<sup>10</sup> Pulpal proportions and cementum thickness decrease with advancing age.<sup>9</sup> The pulp space may be entirely annihilated by 75 years of age.<sup>10</sup> The sensitivity and perfusion of the aging pulp further declines due to alterations in the blood and nerve supply.<sup>9,10</sup> Commonly seen in the aged are the presence of pulp stones and areas of scattered calcification resulting from fibrosis and dehydration of the ground substance.<sup>10</sup>

Complexity in performing oral hygiene procedures coupled with delayed sugar elimination time as a result of poor general health and hyposalivation has a powerful effect on the development of caries.<sup>13,14</sup> The frequently exposed root surfaces become liable to decay.<sup>13</sup> Advanced unbridled dental diseases in the aged may have dramatic impact than in a younger healthy individual, with pneumonia, bacteremia, infective endocarditis, coronary artery disease and brain abscesses and other dismal consequences documented.<sup>2,9</sup>

Gingival recession and loss of periodontal attachment and

alveolar bone are in real fact universal findings in the old.<sup>9</sup> The frequency of occurrence and severity of periodontitis rise with increasing age.<sup>15</sup> The bacterial composition of the periodontal pocket is altered with increasing age as gram positive facultative cocci increase and gram negative anaerobic rods decrease.<sup>12</sup> Momentous attachment loss and tooth mobility can lead to tooth drifting and occlusal interferences.<sup>9</sup> Medical problems and medications may further have a hazardous effect on periodontal health.<sup>9</sup>

*Streptococcus mutans*, *Lactobacillus*, *Porphyromonas gingivalis*, *Treponema denticola*, *Staphylococcus aureus* and *Streptococcus viridans* have been linked to new and recurrent dental caries, periodontal diseases and salivary infections.<sup>9</sup>

Tooth loss may be directly related to periodontal disease and dental caries.<sup>9</sup> However, this may be influenced by systemic conditions such as diabetes mellitus and osteoporosis.<sup>9</sup> Gradually progressing senile atrophy of bone is another menace confronting the old.<sup>12</sup> True loss of bone dimension, as well as osteoporosis may consequently lead to complexity in denture fabrication and nonunion of fractures of the mandible of the elderly.<sup>12</sup> Nonunion of all fractures of the edentulous mandible is noted in 20% of the cases.<sup>12</sup>

The usage of numerous drugs concomitant with underlying systemic disorders makes the aged particularly prone to oral dryness.<sup>16</sup> The “dry mouth syndrome” represents one of the most common grievances after age 65.<sup>12</sup> The increased occurrence of burning sensation of the mouth, dental caries, candidiasis, inability to wear dentures, and decreased sensitivity of the taste buds may in part be attributed to this condition.<sup>12</sup> Acinar destruction and hyalinization, adhesions and obstructions with atrophy of salivary ducts, infection or disease within the stoma of the glands may collectively result in diminished salivary flow.<sup>12</sup> Another cause of decreased flow is Sjogren's syndrome.<sup>9</sup> Chronic sialadenitis may result in destruction of the gland acini and consequently cause decreased saliva production in the aged.<sup>12</sup> Physical devastation of healthy stroma or removal of the gland itself secondary to tumors of the salivary glands are not uncommon and may lead to dryness of the mouth.<sup>12</sup> One should not omit diabetes mellitus, Alzheimer's disease and dehydration as a cause of xerostomia and honest efforts should be made to rule it out or to manage it if present.<sup>9</sup> The drugs commonly implicated in xerostomia are antidepressants, antihypertensives, antiparkinsonian drugs, antipsychotics and antihistamines.<sup>9</sup> Edentulous patients have

appreciably higher salivary immunoglobulin A, immunoglobulin M, amylase and lysozyme concentration.<sup>16</sup> Considerably greater yeast counts have been reported in the aged with poorer salivary flow rates and/or buffering abilities as well with complete dentures.<sup>17</sup>

The frequency of oral mucosal disease of a kind and severity necessitating surgical removal of tissue has been documented to be 47% lower in the non-elderly than in the elderly.<sup>3</sup> Increased occurrence of melanotic macules, presence of lingual varicosities, fibromas, Fordyce's granules and tori as well as exostoses has been noted in the aged.<sup>9</sup> Glossitis, geographic tongue, fissured tongue, black hairy tongue, atrophy of fungiform and filiform papillae, angular stomatitis and oral hyperpigmentation also occur with increasing frequency in the geriatric population.<sup>3,9</sup> These changes may also signal underlying nutritional deficiencies of iron, antioxidants as well as vitamin B and its types.<sup>3</sup>

A number of ulcerative and vesicubullous conditions affect the aged. Local trauma, such as denture-related irritation, accidental biting and sharp dental restorations may be the chief causes in several cases.<sup>9</sup> Oral vesicubullous lesions frequently manifested in the aged include lichen planus, pemphigus vulgaris, and cicatricial pemphigoid.<sup>9</sup> Allergic reactions often manifest in the oral cavity of the old especially to some form of drug therapy. These may manifest as oral candidiasis, oral ulceration, erythema multiforme, angioedema, gingival hyperplasia, pemphigus-like reactions, oral mucosal pigmentation, lichenoid reactions, lupoid reactions and pemphigoid-like reactions.<sup>3,18</sup> Recurrent oral ulcers secondary to nutritional and hematological deficiencies can occur in the elderly.<sup>9,19,20</sup> Ill-fitting dentures may lead to denture stomatitis, papillary hyperplasia and atrophy.<sup>9</sup> Epulis fissuratum or traumatic hyperkeratosis may result from persistent low-grade irritation by ill-fitting dentures.<sup>9</sup>

Leukoplakia is the most common premalignant lesion to manifest in the elderly.<sup>3</sup> Lower lip may be affected in some by actinic/senile elastosis.<sup>10</sup> Oral cancer is the most noteworthy oral mucosal disease in the older adults.<sup>9,21</sup> Squamous cell carcinoma is the most common malignant neoplasm in the oral cavity.<sup>3,9</sup> Basal cell carcinoma in the head and neck region commonly occurs in the elderly fair-skinned individuals.<sup>10</sup> Therapy for malignant lesions usually employing some combination of surgery, radiation or chemotherapy has implications for maintenance of oral

health with protean harmful effects such as salivary hypofunction, mucositis, osteoradionecrosis, radiation caries and dysgeusia.<sup>5,9</sup>

The aged are considered to be at a greater risk for developing opportunistic oral infections.<sup>9</sup> Herpes simplex virus and varicella zoster infection comprise the most common viral infections.<sup>9</sup> Post herpetic neuralgia occurs more commonly in the elderly patients and may last for months or even years.<sup>3,9</sup> Candidiasis is the most common fungal infection affecting the aged.<sup>9</sup>

Epidemiologic surveys have implicated both acute and chronic orofacial pain as considerable evils among the aged.<sup>9</sup> Pain from odontogenic causes is the most ubiquitous in the aged.<sup>9</sup> Disorders of the temporomandibular joint and muscles of mastication, trigeminal and glossopharyngeal neuralgias, atypical facial pain and migraine constitute the extraoral pain disorders.<sup>8,9,22</sup> The onset of spontaneous orofacial dyskinesia has been proposed to arise in a state of edentulism.<sup>23</sup>

Emergency crises during dental treatment may be precipitated by hypertension, anticoagulation therapy, and hypoglycemia.<sup>4</sup> Infection of replaced joints and cardiac prosthetic valves may be avoided by antibiotic prophylaxis prior to dental procedures in feeble elders.<sup>4</sup> Precise health problem management during dental therapeutics together with treatment of oral diseases poses incredible challenges for the dentists.<sup>2</sup> Drugs with a long duration of action and those with eminent central nervous system effects are best avoided.<sup>5</sup> The admonitory maxim 'Go low, Go slow', is frequently cited in the management of geriatric health care.<sup>5</sup> Advances in dental materials and novel therapeutic modalities for diseases frequently manifested in the old must be known to the dentist. In patients with a high caries risk, hybrid/resin ionomer: a recently developed restorative material that liberates fluoride is recommended.<sup>24</sup> Despite numerous painstaking efforts in the field of prosthodontics, intricate problems related to construction of complete dentures and implant placement continue to exist in patients with atrophic alveolar ridges.<sup>4</sup> The chief aim of preventive dentistry in patients who have teeth should be directed towards averting primary or recurrent caries in addition to thwarting a more severe loss of supporting tissue.<sup>25</sup> Domiciliary care may be proper for a severely disabled patient as it helps evade the physical or emotional tribulations of a hospital visit.<sup>8</sup>

Managing the aged is a frequent problem for practitioners. Advances in our understanding of geriatric disease and care

coupled with increasing awareness of patients have fortunately helped in reducing the burden of several ailments affecting the old. Gerontologist Steven Austad opines that the first person to live to 150 has already been born.<sup>26</sup> Innovative treatments comprising of hippocampus implants to eradicate Alzheimer's disease as well as gold-shelled silica nanospheres to destroy cancerous tumors may help improve quality of life and enhance longevity in the near future.<sup>26</sup>

## CONCLUSION

Oral health care providers are often vanguard in detecting age-related morbid conditions through routine oral examination<sup>4</sup>. To put it in a nutshell, just as one cannot make a stable cottage out of termite eaten wood similarly one cannot build his or her structure of life on agonized old generation wreathing in pain. As oral physicians, early detection and recognition of the oral diseases shall enhance the prognosis and greatly reduce the associated mortality and morbidity. It has been rightly stated that the oldest tree bears the sweetest fruits. Sincere efforts need to be put in improving the health care for the old and providing them with a 'la troisieme age' that ought to be enjoyed.

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