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Oral health in elderly people: A neglected issue

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Abstract
Advancing age puts many elderly people at risk for a number of oral health problems, such as darkened teeth, dry mouth,root decay, gum disease, tooth loss etc As we age, issues that affect our mouth can increase or worsen. So, it's especially important to be aware of conditions associated with aging that can impact oral health. Data on the oral health of the elderly depict a worrying situation, with an elevated prevalence of caries and moderate periodontal disease, frequent edentulism, and numerous cases of dry mouth and oral cancer. There is wide evidence that periodontitis is a risk factor for certain systemic diseases, and impaired oral health has been associated with mastication and nutritional problems, especially among the elderly, with highly negative effects on their quality of life. In this nonsystematic review, the authors discuss the importance of evaluating the oral health of the geriatric population in a comprehensive manner, beyond simple clinical assessments.

Keywords: oral health, well-being, elderly, oral health quality

Introduction

Ageing, is the process of becoming older. It refers especially to human beings, many animals, and fungi, whereas for example bacteria, perennial plants and some simple animals are potentially immortal. In the broader sense, ageing can refer to single cells within an organism which have ceased dividing (cellular senescence) or to the population of a species (population ageing).

In humans, ageing represents the accumulation of changes in a human being over time, encompassing physical, psychological, and social changes. Reaction time, for example, may slow with age, while knowledge of world events and wisdom may expand. Ageing is among the greatest known risk factors for most human diseases: of the roughly 150,000 people who die each day across the globe, about two thirds die from age-related causes.

The causes of ageing are uncertain; current theories are assigned to the damage concept, whereby the accumulation of damage (such as DNA oxidation) may cause biological systems to fail, or to the programmed ageing concept, whereby internal processes (such as DNA methylation) may cause ageing. Programmed ageing should not be confused with programmed cell death (apoptosis).

The discovery, in 1934, that calorie restriction can extend lifespan by 50% in rats has motivated research into delaying and preventing ageing.

Aging is a natural process. Old age should be regarded as a normal, inevitable biological phenomenon. As a result of the advances made in medicine and public health measures in the last half of the 20th century, there is a substantial increase in the life span of man. Elders above 65 years (old age) have health problems as a result of aging process, which calls for special consideration.

During the latter half of the 20th century, the age composition of the population changed dramatically, with more people living to older ages and the older population getting older. This demographic change will have a major impact on the delivery of general and oral-health care, as well as on the providers of these services. Although some older adults have physical and/or psychological conditions that require special attention in the dental office setting, one should not assume that all older people share these conditions.

According to the WHO, the global population is increasing at the annual rate of 1.7%, while the population of those over 65 years is increasing at a rate of 2.5%. Both the developed, as well as the lesser-developed countries, are expected to experience significant shifts in the age distribution of the population by 2050. The fastest growing population segment in most countries is the adults older than 80 years, which according to the United Nations estimates will make up nearly 20% of the world's population.

In India, with its population of over one billion people, people older than 60 years constitute 7.6% of the total population, which amounts to 76 million. Incidence of oral cancer, which is an old age disease, is highest in India.

Of added concern may be the presence of systemic disease that not only influences the patient's ability to maintain oral hygiene and promotion of oral health, but can actually be related to the occurrence of certain oral diseases. Though impairments are not life threatening, they affect a person's

quality-of-life. Thus, planning treatment for the senior dental patient includes an understanding of the chronic diseases the patient lives with daily, as this play a critical role in the acceptance and success of the dental treatment plans.

Elderly segment

- People aged 65-74 years are the new or young elderly who tend to be relatively healthy and active;
- People aged 75-84 years are the old or mid-old, who vary from those being healthy and active to those managing an array of chronic diseases;
- People 85 years and older are the oldest-old, who tend to be physically frailer. This last group is the fastest-growing segment of the older adult population.

There is a sudden blast of the "65 plus" population in the last decade, and India is no exception to that.

Potential comorbidities in aeging

The health status of adults older than age 65 years can be quite variable, ranging from functional independence to frail or cognitively impaired. According to the U.S. Administration on Aging, over 40% of non-institutionalized adults aged 65 years or older assessed their health as excellent or very good (compared to 55% for persons aged 45 to 64 years). Most older persons have at least one chronic condition and many have multiple conditions. In the time period up to and including 2013, the most frequently occurring conditions among older persons were: hypertension (71%), arthritis (49%), heart disease (31%), any cancer (25%), and diabetes (21%). A 2015 report by the World Health Organization listed 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.

Physiologic changes that are age related include changes to cellular homeostasis, including regulation of body temperature and blood and extracellular fluid volumes; decreases in organ mass; and decline in or loss of body system functional reserves. Changes to the gastrointestinal system include decreases in intestinal blood flow and gastric motility and increased gastric pH. Renal, cardiovascular, respiratory, central nervous, and/or immune systems may show decreased function (e.g., decreases in glomerular filtration, cardiac output, lung capacity, sympathetic response, cell-mediated immunity). These changes may have an effect on medication absorption and metabolism or an individual's sensitivity to certain medications

Physical changes associated with aging include decreased bone and muscle mass. Osteoarthritis may result in limitations in mobility. Visual changes may include age-related macular degeneration, presbyopia, cataracts, glaucoma, or diabetic retinopathy. Patients may experience age-related hearing loss, which may affect their ability to communicate. Postural reflexes can become dampened, and falls become more common in elderly individuals.

Older adults may also demonstrate a spectrum of cognitive acuity, ranging from not at all affected to mild cognitive impairment to frank dementia. Dementia is a syndrome characterized by progressive deterioration in multiple cognitive domains, severe enough to interfere with daily functioning. Older patients with poor cognitive health will have difficulty managing medications, medical conditions, or other self-care, including dental hygiene.

Medication Considerations

According to data from NHANES, 39% of people aged 65 years and older reported using 5 or more prescription drugs ("polypharmacy") in the prior 30 days during the year 2011 through 2012. Ninety percent of people 65 years of age and older reported using any prescription drug in the prior 30 days. The high prevalence of polypharmacy among older adults may lead to inappropriate drug use, medication errors, drug interactions or adverse drug reactions. The average older adult takes 4 or 5 prescription drugs; in addition, these individuals may also be taking 2 or 3 over-the-counter (OTC) medications. A review of older dental patients' medical history and current medications, both prescription and OTC medications/supplements, should be done regularly. Drugs most commonly prescribed in elderly patients include "statin" drugs for hypercholesterolemia; antihypertensive agents; analgesics; drugs for endocrine dysfunction, including thyroid and diabetes medications; antiplatelet agents or anticoagulants; drugs for respiratory conditions (e.g., salbutamol); antidepressants; antibiotics; and drugs for gastroesophageal reflux disease and acid reflux. The most frequently taken OTC medications by older adults include analgesics, laxatives, vitamins, and minerals. Older adults frequently show an exaggerated response to central nervous system drugs, partly resulting from an age-related decline in central nervous system function and partly resulting from increased sensitivity to certain benzodiazepines, general anesthetics, and opioids.

The American Geriatrics Society has published a 2015 update to the Beers Criteria for potentially inappropriate medication use in older adults. Beers Criteria potentially inappropriate medications have been found to be associated with poor health outcomes, including confusion, falls, and mortality. One change of note to the 2015 Beers Criteria includes the addition of opioids to the category of central nervous system medications that should be avoided in individuals with a history of falls or fractures.

Oral Health and Dental considerations

General

Xerostomia affects 30% of patients older than 65 years and up to 40% of patients older than 80 years; this is primarily an adverse effect of medication(s), although it can also result from comorbid conditions such as diabetes, Alzheimer's disease, or Parkinson's disease Xerostomia, while common among older patients, is more likely to occur in those with an intake of more than 4 daily prescription medications. Dry mouth can lead to mucositis, caries, cracked lips, and fissured tongue. Recommendations for individuals with dry mouth include drinking or at least sipping regular water throughout the day and limiting alcoholic beverages and beverages high in sugar or caffeine, such as juices, sodas, teas or coffee (especially sweetened).

Older adults are at increased risk for root caries because of both increased gingival recession that exposes root surfaces and increased use of medications that produce xerostomia; approximately 50% of persons aged older than 75 years of age have root caries affecting at least one tooth. Ten percent of patients 75 to 84 years of age are affected by secondary coronal caries; this is likely related to the prevalence of

restorations in the older population. Adoption of good oral hygiene, which includes use of rotating/oscillating toothbrushes, and the use of topical fluoride (i.e., daily mouth rinses, high fluoride toothpaste and regular fluoride varnish application), as well as attention to dietary intake have been recommended in the literature. Because cardiovascular disease is common among older individuals, it has been suggested by Ouanounou and Haas that the dose of epinephrine contained in anesthetics should be limited to a maximum of 0.04 mg. The authors recommend that even without a history of overt cardiovascular disease, the use of epinephrine in older adult patients should be minimized because of the expected effect of aging on the heart. They recommend monitoring blood pressure and heart rate when considering multiple administrations of epinephrine-containing local anesthetic in the older adult population.

Cognitive Limitations Affecting Dental Care and Self-Care

Patients with severe cognitive impairment, including dementia, are at increased risk for caries, periodontal disease, and oral infection because of decreased ability to engage in self-care. Education of the caregiver, as well as the patient, is an important part of the prevention and disease management phase of dental care. Communication during the dental appointment may be challenging when the older adult has cognitive impairments. It is recommended that the number of people, distractions, and noise in the operatory be minimized when providing care to a patient with dementia, although a trusted caregiver in the room may provide reassurance to the patient. Patients should be approached from the front at eye level and use of nonverbal communication, such as smiling and eye contact, is important. The dentist should begin the conversation by introducing himself or herself. Because a patient with cognitive limitations may become overloaded with information easily, instructions should be simple and sentences short, such as, "Please open your mouth. Because cognitive impairment or dementia can affect a patient's ability to follow instructions following oral surgery, it is recommended that practitioners ensure local hemostasis (i.e., sutures, local hemostatics, socket preservation techniques) prior to dismissal from the dental practice. Dentate patients with cognitive limitations should be encouraged to brush their teeth two or more times daily; use of an electric or battery-operated toothbrush should be considered. The same oral care routine should be followed consistently, as possible. In patients with removable prosthetic devices, the device(s) should be removed, inspected, and cleaned before bed and returned to the mouth in the morning.

Physical and Sensory Limitations Affecting Dental Care and Self-Care

Patients with Hearing Loss: Dental care providers should speak slowly, clearly, and loudly when talking with older patients to enhance hearing and understanding. It is important to make sure that speaking loudly and slowly does not introduce a patronizing or condescending tone of voice. Yellowitz in *The ADA Practical Guide to Patients with Medical Conditions* advises the following in communicating with patients with hearing loss and/or hearing aids: In patients who read lips, face the patient while speaking, speak clearly and naturally; and make sure your lips are visible (remove mask). Be at the same level as the patient.

- Gain the patient's attention with a light touch or signal before beginning to speak. Be sure the patient is looking at you when you are speaking and avoid technical terms. Use written instructions and facial expressions.
- Inform the patient before starting to use dental equipment or when equipment is changed, resulting in an altered experience, e.g., vibrations from a low-speed versus a high-speed handpiece.
- In patients with hearing aids, minimize background noise when speaking. Avoid sudden noises and putting your hands close to the hearing aid(s). Patients may want to adjust or turn off the hearing aid(s) during treatment.
- Written and illustrated materials and websites can be used to help explain dental information, procedures, and postoperative instructions

Patients with Visual Loss

Age-related visual impairment, such as cataracts, glaucoma or presbyopia, can diminish a person's ability to process nonverbal conversational cues that frequently are communicated visually Ensure the patient can clearly see demonstrations and read written materials, including appointment cards and instructions. The following tools and strategies can assist visually impaired older adults in the dental office:

- Large-print magazines in the waiting room
- Good lighting throughout the office; add spot/task lighting in areas used for completing forms
- Large print on prescription bottles
- Install blinds or shades to reduce glare
- Use contrasting colors on door handles, towel racks, and stair markers

Patients with Physical Limitations/Loss of Mobility: Osteoarthritis or rheumatoid arthritis in the hand, fingers, elbow, shoulder, and/or neck can affect a person's ability to maintain good quality oral health self-care. Modification of manual toothbrush handles (e.g., with Velcro® straps or attaching a bicycle handlebar grip) or use of an electronic toothbrush with a wide, grippable handle can help accommodate for lost mobility. Floss holders or interdental cleaners/brushes can aid in cleaning between teeth increasing the frequency of dental cleanings and examinations can help promote optimal maintenance of oral hygiene.

Status of oral health

Nutrition in old age and its implications for oral care

Adequate nutrition is a vital factor in promoting the health and wellbeing of the aged. Inadequate nutrition may contribute to an accelerated physical and mental degeneration. Poor oral health can be a detrimental factor to nutritional status and health. Disorders of the oral cavity have contributed to poor eating habits in the elderly. Loose painful teeth or ill-fitting dentures may result in a reduced desire or ability to eat. A compromised nutritional status, in turn can further undermine the integrity of the oral cavity are closely interrelated, diet and nutrition should be considered as an integral part of the oral health assessment and management of the elderly.

Caloric requirements usually decrease in the elderly because of a decline in the basal metabolic rate, brought on by reduced lean muscle mass and lower exercise levels. Appetite and food intake may also decrease, leading to an insufficient caloric intake and frequently results in insufficient consumption of calcium, iron and zinc more frequently in females. Approximately 8000 kJ (1900 kcal) is the required calorie requirement in 80 years old. An active elderly subject requires a protein intake of 0.97 g/kg of body weight per day. However patients suffering from tissues necrosis or inflammation shows an increase in protein turnover and requirements. Among the vitamins, most nutrients are recommended in the same amounts for elderly as for younger people. However, certain groups of elderly, such as those homebound, with no access to sunlight, may have insufficient vitamin D and develop osteomalacia. The other important nutrients required by the older individuals are ascorbic acid, iron, and potassium.

Dental status is considered to be an important contributing factor to health and adequate nutrition in elderly. Missing dentition and ill-fitting dentures cause difficulty in chewing and perception of taste of foods.

Although chewing efficiency and nutritional status improve when inadequate dentition or edentulousness is corrected with partial or complete dentures, with these replacements, mastication is less efficient than with intact natural dentition. Denture status may contribute to dietary changes to soft; easily masticate certain foods, which are often high in fermentable carbohydrates that may predispose to the development of root caries lesions.

The dentists are hence in an ideal position to contribute to the well-being of the elderly population. Dentists should be alert to nutritional risk factors in the elderly population and by careful screening can intervene in the early stages of nutritional problems when such interventions can be most valuable and effective.

Changes in salivary glands and salivary secretion with aging

The diminished function of salivary gland is commonly associated with aging. The implications of disordered salivary gland maintenance of oral health. The presence of saliva protects the oral cavity the upper airway and digestive tract and facilitates numerous sensorimotor phenomena. The absence of saliva thus has many deleterious consequences to the host.

With advancing age, there is an atrophy of acinar tissue, a proliferation of ductal elements and some degenerative changes in the major salivary glands. These alterations tend to occur linearly with increasing age. Minor salivary glands also undergo similar degenerative changes with advancing age. Thus, there is a normal, uniform decrease in the acinar content of salivary gland tissue accompanying the aging process.6

However, it is difficult to make a general conclusion about age-related status of fluid output from salivary glands. It appears that decreased salivary flow does not uniformly accompany the aging in healthy persons. These functional observations contrast with morphologic changes seen in aging salivary glands. One explanation that has been hypothesized to account for this is that salivary glands possess a functional reserve capacity, enabling the glands to maintain a constant fluid output throughout the human adult life span.6

The main oral health problems of old age that is mouth dryness and dental caries have been attributed to the reduced salivary flow.

Age changes in oral mucous membrane

The oral mucosa performs essential protective functions that profoundly affect the general health and well-being of the host.

A decline in protective barrier function of the oral mucosa could expose the aging host to myriads of pathogens and chemicals that enter the oral cavity during daily activities.

Both histologic layers of the oral mucosa, the epithelium, and connective tissue, have important defensive functions. A stratified epithelium, containing closely apposed, attached cells, and constitutes a physical barrier that interferes with the entry of toxic substances and microorganism. Mucosal epithelial cells also synthesize several substances that are critical for maintenance of the mucosal surface, such as keratin and laminin.7

Oral mucosal surfaces also possess a protective self-cleansing mechanism provided by the natural turnover of the epithelial cells.

Earlier studies report that the oral mucosa becomes increasingly thin, smooth with age and that it acquires satin like edematous appearance with loss of elasticity and stippling. The tongue in particular is reported to show marked clinical changes and to become smoother with loss of filiform papillae. With age, there is a tendency for development of sublingual varices and an increasing susceptibility to various pathological conditions such as *Candidal* infctions and a decreased rate of wound healing.

An additional complication in evaluating oral mucosal status in older persons is the use of prosthetic appliances, which have considerable potential to alter mucosal integrity if not maintained properly.

Changes in the teeth with aging

The gradual changes taking place in the dental tissues after the teeth are fully formed are referred to as age changes. Most of the tissues have a physiological turnover of their components but however, some tissues do not exhibit any turnover such as the enamel.

The macroscopic changes taking place with age in the teeth change in form and occur with age. Wear and attrition affect the tooth form. The perikymata and imbrication lines are lost, giving the enamel surface a flat appearance with less detail than in newly erupted teeth.

The altered surface structure gives the teeth in older individuals a different pattern of light reflection, which causes a change in the observed color. Changes in the dentin, both in quantity (thickness) and quality also result in a gradual loss of transparency. Pigmentation of anatomical defects, corrosion products and inadequate oral hygiene may also change the tooth color.

All the changes in enamel are based on ion-exchange mechanisms. It becomes less permeable and possibly more brittle with age. The nitrogen content of enamel is showed to increase with age. No explanation could be offered to account for the increase in organic material, but probably the filling in of the cracks by organic material (acquired lamellae).

A two age dependent change takes place in dentin:

- Continued growth, referred to as physiological secondary dentin formation.
- Gradual obturation of the dentinal tubules referred to as dentin sclerosis.

The dental pulp in teeth from old individuals differs from that in younger teeth by having more fibers and fewer cells, and hence reduces in volume.

The blood supply, including the rich plexus of capillary loops in the subodontogenic region, is greatly reduced. These changes are important because the pulp cannot be expected to have the same reparative capacity as the younger teeth. Electron microscopy of old pulps has shown loss and degeneration of both myelinated and unmyelinated nerves and thus affected the healing capacity of pulp. Pulp calcifications are also found to increase in frequency, number and size with age. Diffuse calcification and narrowing of the root canals with increasing age.

Cementum apparently continues to be laid throughout life, but the rate of formation diminishes with age. Under some circumstances, excess amounts of cementum may be formed (hypercementosis) associated with accelerated elongation of an unopposed tooth or to an inflammatory stimulus.

Furthermore increase in the fluoride and magnesium content is seen with age. The cementum may contain one of the very few biomarkers of age. Countable, microscopically clear annular rings have been found in teeth that might aid in age determination in forensic specimens.

Age changes in morphology of teeth have important clinical implications as these changes may influence the outcomes of the restorative treatments and also have a great bearing on the reparative responses.

Aging and periodontal disease

Globally, the percentage of the subjects with community periodontal index scores 4 (deep pockets) ranges from approximately 5-70% among older people.9 Periodontal diseases are among the most prevalent chronic conditions in dentate older populations. Several epidemiological surveys have found that the prevalence and severity of periodontal diseases increase with age.

Periodontal disease in the elderly does not appear to be specific disease but the result of a chronic adult periodontitis since adulthood although age-related changes have been documented in the periodontium of elders, these changes do not appear to be the cause of periodontal disease in the elderly. Enhanced severity of periodontal diseases with age has been related to the length of time the periodontal tissues have been exposed to the dentogingival bacterial plaque and is considered to reflect the individual's cumulative oral history. However, the susceptibility of the periodontium to plaque-induced periodontal breakdown may be influenced by the aging process or by a specific health problems of the aging patient.

At the biological level, aging is associated with changes that lead to a progressive, irreversible deterioration of the functional capacities of several tissues and organs. Changes in structure and function during aging may affect the host response to plaque microorganisms and may influence the rate of periodontal destruction in older people. The greater amount of plaque recovered in the elderly subjects could be due, in part, to a larger area for plaque retention because of the gingival recession. Further, exposed cementum of the root surface and dental enamel constitute two unlike types of hard dental tissues with distinct surface characteristics, which may influence the plaque formation rate differently. Differences in dietary habits, increased flow of gingival exudate from the inflamed gingiva and possible age-related changes in salivary gland secretions may similarly alter the conditions for growth and multiplication of the plaque microorganisms.

Prosthetic considerations in geriatric dentistry

In many industrialized societies, more than 50% of the elderly population are edentulous.7 Deciding the treatment and determining the prognosis are influenced by various systemic and local factors as well as person's previous experience with dentures.

The most important determinants are:

- Debilitating diseases: As a consequence, people often totally neglect oral and prosthetic care. This situation may have serious implications in providing satisfactory dental care. Thus, prosthetic treatment should be postponed until the person's general health is restored. For chronically ill patients maintenance of oral hygiene as a way to control caries and periodontal disease is the most applicable treatment option.
- Neurophysiological changes: Functional elements in the central nervous system degenerate with advancing age. These changes limit the person's capacity for acquiring new muscle activity patterns. Elderly people, therefore, adapt more slowly to prosthetic treatment and learn new muscle activity patterns.
- Mental changes: The presence of mental disorders in elderly patients may complicate the outcome of prosthetic treatment. Patients may acquire quite aberrant conceptions of what can be achieved by prosthetic treatment.
- Oral physiological changes: Progressive atrophy of the masticatory, buccal and labial musculature is a sign of aging. In the denture wearer, however, this process is often accelerated. Atrophy of the masticatory muscles may severely reduce chewing efficiency, which cannot be sufficiently improved through prosthetic treatment. Instead, it is important to advise the person on how to attain an adequate diet that is easy to chew.
- Reduced salivary secretion or xerostomia is frequently a complicating factor of debilitating diseases such as diabetes or of treatment with psychotropic agents. This results in rampant caries loss of denture retention and traumatic lesions and infections of the oral mucosa. Meticulous oral hygiene supplemented by mouthwashes with chlorhexidine and daily use of artificial salivary substitutes are important means to reduce complications to denture wearing in people with xerostomia

Schou *et al*. (1982) observed a significant relation between denture plaque and presence of stomatitis.

The effect of prosthetic management in geriatric dentistry is determined by a number of factors such as the patient's degree of cooperation, the financial resources available for care, the biological and technical quality of prosthetic materials.

Preventive dental care for elderly people

The design and implementation of comprehensive preventive dentistry protocols for elders presents the dental profession

with many challenges. Although a specific protocol must be tailored to meet the unique needs of the individual patient, there are certain factors common to elderly segment of the population that may influence these protocols.

Need for preventive services

Although the elderly are retaining their dentition longer than in the past, dental morbidity prevalence of dental diseases continues to be high. Presence of root caries, periodontal disease and xerostomia are oral diseases that are found majorly affecting the older population. Despite these conditions affecting the elderly being treatable or preventable, many of the elderly do not avail the needed treatment. This may because, most of the current older than 60 were not introduced to the concept of preventive dentistry at a young age and thus are not inclined to it. Many still hold the opinion that tooth loss is a normal part of the aging process and is not preventable. Others have adapted to a compromised oral health status and seek treatment only when an emergency arises.

Problems of providing preventive dental care for elderly people

One of the major challenges in providing restorative as well as preventive care for elderly people is to develop an appreciation of the need for regular care. 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. The basis of prevention is related to detecting disease at the earliest possible stage, which requires regular patient contact. The many factors that are known to influence older people's utilization of dental services directly or indirectly can be divided into four main categories.

Illness and health related factors

- Oral health status.
- Experiencing discomfort.
- General ill health.
- Mobility, functional limitation.

Socio-demographic factors

- Place of residence.
- Education.
- Income.
- Age.
- Sex.
- Culture.
- Ethnicity.

Service-related factors

- Accessibility.
- Dentist behavior.
- Dentist attitude.
- Price of service
- Satisfaction with service.
- Transport.

Attitudinal or subjective factors.

- Personal beliefs.
- Feeling no need, perceived need.
- Perceived importance.
- Fear and anxiety.
- Resistance to change.
- Perceived financial strain.
- Satisfaction with dental visits.

Components of preventive dentistry

Mechanical plaque removal

Several reports worldwide have shown that use of professional dental health services is low among older people, particularly among the socio-economically disadvantaged.14 The preferred method of brushing for most elders is sulcular brushing with soft toothbrush (Bass method). Persons with gingival recession should be instructed to observe certain precautions avoid further recession or cemental abrasion. These may include the use of an extra soft toothbrush, use of light pressure, modification of the brushing method. The plaque retention in the elderly is exacerbated by the presence of restorations, missing teeth and gingival recession. The wearing of removable dentures may also negatively influence plaque accumulation. In addition, they often face difficulty in mechanical removal of plaque because of reduced manual dexterity or impaired vision or due to physical limitations associated with conditions such as stroke, Parkinson's disease or severe arthritis.

The elderly person should be helped to develop the ability to brush effectively and thoroughly. Those who have diminished manual dexterity may benefit from the use of traditional mechanical toothbrushes, rotary electric toothbrushes, or manual brushes that have been adapted or customized for each person.

Rinses

A therapeutic rinse contains an agent that is beneficial to the tooth surface or oral environment. Therapeutic rinses may contain chlorhexidine, sodium benzoate, sanguinaria, a fluoride, or other remineralizing agents, which can enhance oral disease and should be recommended to the elderly when appropriate

Chlorhexidine rinse has numerous applications for treatment of elderly. It is primarily indicated for gingivitis. However, it is effective against a variety of plaque bacteria, thus enhancing the patient's mechanical plaque control efforts. This is especially important for patients with physical and mental disabilities. It also reduces oral mucositis and candidiasis in immune suppressed patients such as those on intensive chemotherapy.

Fluoride has known to prevent the development of caries through three important mechanisms. The first, it inhibits the development of caries by being incorporated into the developing enamel in the form of fluorapatite. Secondly, it enhances remineralization of the carious enamel. Third, fluoride has an anti-bacterial action. Thus fluorides in the form of gels, varnishes, rinses, or dentifrices play and important role in the prevention in caries prone older patients.

Remineralizing rinses can be used in an elderly person who continually experiences new coronal or root carious lesions as a consequence of severe xerostomia. This replaces the calcium and phosphate lost from enamel or cementum. This is most effective when used with topical fluorides.

Plaque control for the elderly with physical limitations

Many elderly persons are hampered in their efforts of effectively performing plaque control procedures by physical disabilities that result in the lack of manual dexterity or impaired range of motion of the wrist, elbow or shoulder. Their plaque removal efforts may be enhanced by use of an electric device or by adaptation of manual plaque control aids.

Electric devices

This can be an invaluable aid for the elderly when used properly. These devices have enlarged handles, which may be grasped more easily than the standard manual toothbrush handle. The major advantage derives that they are motor driven, thus requiring little or no arm or wrist movement, and the need to make consistent movements. Some of the electric plaque removal devices are designed in such a way that the action stops if too much pressure is applied. However, an elderly person who has congenital heart disease or any condition affecting heart valves should be cautioned about the danger of developing subacute bacterial endocarditis secondary to soft tissue trauma caused by improper use of electrical devices.

Adaptive aids

If an elderly person's grip is weakened by a condition such as an arthritis, they encounter difficulty in grasping the slender handle of a conventional toothbrush, floss holder, or other home care aid. To enable the patient to perform effective plaque removal, the handle can be enlarged or built up so that it can be grasped easily and comfortably.

Denture care

Many edentulous elderly believe erroneously that once all their teeth have been extracted they no longer need to be concerned about oral health. The elderly who wear dentures should be taught proper home care of both dentures and tissues on which they rest as well as the need for continued professional care.

The tissues can be prevented from harm by avoiding wearing the denture constantly. An instruction for the removal of the denture while retiring for the night is essential. The cleaning and massaging of the tissues under a denture at least once a day increases circulation and thus enhances the health of these tissues.

Elderly persons who wear full or partial denture must be taught to clean these appliances in a way that is effective. Immersion of denture in cleansers is the recommended method that ensures safety against damage of the denture material. The patient should be instructed always to brush and rinse the denture thoroughly before and after soaking in immersion cleans.

Counseling and education

Preventive dentistry counseling for the geriatric patient includes two components:

- Education
- Motivation

Patient education includes a discussion with the patient of the causes of current and pastoral disease and means of intervention and prevention of future disease. Discussion of etiology should be complete, but appropriate to the level of understanding of the individual elderly person.

When one is providing instruction in home care procedures, whether teaching the elderly person himself or a caregiver, a simple yet effective model the dentist should practice a simple yet effective model.

Tell---Show---Do

- Tell or explain the procedure:
- Show or demonstrate the procedure:
- Finally, the learner can do or practice the technique until he has mastered the skills involved in performing it effectively
- The last step is the most important one if the learner is to develop proficiency.

Counseling and adherence

Possession of preventive knowledge and skills alone will not ensure the elderly person's attainment of the goal of preventive counseling that is, maintenance of optimal oral health status. The dental professional and patient must establish a therapeutic alliance, whereby each is committed to performing the activities necessary to achieve this goal. The patient must be convinced that ultimately only he can help himself by adhering to the recommended preventive measures. The dentist should work to dispel the misconception that oral disease is an inevitable consequence of aging, and that; consequently, the attempt to prevent oral disease is a futile effort.

Thus, the oral health services should be organized and developed to secure adequate early detection, prevention and treatment of oral health problems for all elderly people, whether living at home or in hospitals or in institutions. The achievement of such a service goes beyond what the dental profession can do alone. It requires the involvement of other health professionals, health care workers of the elderly people. However, it presents a realistic goal that could assure good quality of life and a reduction in the dental expenses for the elderly patients.

Conclusions

The major block in oral health care of elderly and the residents would be the underestimation of the oral health care need by them. The dental care of the residents is often limited to emergency care and is not aimed at retaining teeth. Conversely, with changing attitudes the oral health goal should include: Keeping their teeth, keeping their teeth healthy and keeping their teeth pretty.

The best option to serve the residents would be "home dentistry or domiciliary dental care," however it is yet an infrequent practice in India. Surveys should be conducted in this sector very routinely to spot the residents in the need of oral care circumscribing nursing homes, old age homes, ashrams, secure units, and community households.

References

1. Federal Interagency Forum on Aging-Related Statistics. Older Americans 2012: Key indicators of well-being Accessed. 2015.
2. Public health and aging: retention of natural teeth among older adults--United States, 2002. MMWR Morb Mortal Wkly Rep, 2003; 52(50):1226-9.
3. National Institute of Dental and Craniofacial Research. Dental caries (tooth decay) in seniors (age 65 and over). National Institutes of Health Accessed. 2015.
4. Eke PI, Dye BA, Wei L *et al.* Update on Prevalence of Periodontitis in Adults in the United States: NHANES 2009 to 2012. J Periodontol. 2015; 86(5):611-22.
5. Yellowitz JA, Schneiderman MT. Elder's oral health crisis. J Evid Based Dent Pract. 2014; 14(Suppl):191-200.
6. Razak PA, Richard KM, Thankachan RP *et al.* Geriatric

oral health: a review article. J Int Oral Health. 2014; 6(6):110-6.
7. Preston AJ. Dental management of the elderly patient. Dent Update. 2012; 39(2):141-3.
8. Stein P, Aalboe J. Dental care in the frail older adult: special considerations and recommendations. J Calif Dent Assoc. 2015; 43(7):363-8.
9. Administration on Aging (AOA). Health and health care. U.S. Department of Health and Human Services Administration for Community Living Accessed. 2015.
10. World Health Organization. Ageing and health (Fact Sheet No. 404). 2015.
11. Harris NO. 6th ed. New York: Prentice Hill. Primary Preventive Dentistry. 1999.
12. Holm-Pedersen P, Loe H. 2nd ed. London: Wiley. Textbook of Geriatric Dentistry. 1997.
13. National Programme for the Health Care of the Elderly (NPHCE) Directorate General of Health Services Ministry of Health &Family Welfare Government of India.
14. Panchbhai AS. Oral health care needs in the dependant elderly in India. Indian J Palliat Care. 2012; 18(1):19-26.
15. Papas AS, Niessen LC, Chauncey HH. St. Louis: Mosby Yearbook; 1991. Geriatric Dentistry–Aging and Oral Health.
16. Park K. 21st ed. Jabalpur: Bhanot Publishers; 2011. Preventive and Social Medicine.
17. Persson RE, Truelove EL, LeResche L, Robinovitch MR. Therapeutic effects of daily or weekly chlorhexidine rinsing on oral health of a geriatric population. Oral Surg Oral Med Oral Pathol. 1991; 72(2):184-91.
18. Peter S. 2nd ed. NewDelhi: Arya (Medi) Publishing House. Essentials of Preventive an Community Dentistry. 2004.
19. Petersen PE, Holst D. Utilization of dental health services. In: Cohen L, Gift HC, editors. Disease Prevention and Oral Health Promotion. Copenhagen: Munksgaard. 1995.
20. Schou L, Wright K. Danish public awareness of general health and international perspectives. Tandlaegebladet. 1982; 86(15):511-6.
21. Schou L. Oral health, oral health care and oral health promotion among older adults: Social and behavioural dimensions. In: Cohen LK, Gift HC, editors. Disease Prevention and Oral Health Promotion. Copenhagen: Munksgaard. 1995.
22. Slaughter A. Providing Dental Care for Older Adults in Long Term Care. University of Pennsylvania School of Medicine. 2006.
23. Soini H, Routasalo P, Lauri S, Ainamo A. Oral and nutritional status in frail elderly. Spec Care Dentist. 2003; 23:209-15.
24. Suresh R. Prevention and Treatment of age Related Diseases. The Netherlands: Springer. Aging and periodontal disease. 2006, 93-200.
25. Vissink A, Spijkervet FK, Amerongen VA. Aging and saliva: Areview of the literature. Spec Care Dentist. 1996; 16(3):95-103.
26. World Health Organization. WHO Oral Health Country/Area Profile. Available from: http://www.whocollab.od.mah.se/index.html .
27. World Health Organization. World report on ageing and health. 2015 Accessed. 2016.
28. Dodds C. Physiology of ageing. Anaesthesia & Intensive Care Medicine. 7(12): 456-58.
29. Ouanounou A, Haas DA. Pharmacotherapy for the elderly dental patient. J Can Dent Assoc. 2015; 80:f18.
30. Yellowitz JA. Geriatric health and functional issues. In: Patton LL, Glick M, editors. The ADA
31. Practical Guide to Patients with Medical Conditions. 2nd ed. Hoboken, NJ: John Wiley & Sons, Inc. 2016, 405-22.
32. Kantor ED, Rehm CD, Haas JS, Chan AT, Giovannucci EL. Trends in prescription drug use among adults in the United States from 1999-2012. JAMA. 2015; 314(17):1818-31.
33. Fitzgerald J, Epstein JB, Donaldson M *et al.* Outpatient medication use and implications for dental care: guidance for contemporary dental practice. J Can Dent Assoc. 2015; 81:f10.
34. Radler DR. Dietary supplements: clinical implications for dentistry. J Am Dent Assoc. 2008; 139(4):451-5.
35. Bowie MW, Slattum PW. Pharmacodynamics in older adults: a review. Am J Geriatr Pharmacother. 2007; 5(3):263-303.
36. American Geriatrics Society. Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. J Am Geriatr Soc. 2015.
37. Jablonski RY, Barber MW. Restorative dentistry for the older patient cohort. Br Dent J. 2015; 218(6):337-42.
38. US. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health. 2000.
39. Gregory D, Hyde S. Root caries in older adults. J Calif Dent Assoc. 2015; 43(8):439-45.
40. Stein PS, Aalboe JA, Savage MW, Scott AM. Strategies for communicating with older dental patients. J Am Dent Assoc. 2014; 145(2):159-64.