Review Article

Oral Health Care in the Elderly

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Introduction

Advances in medical science, technology and education have resulted in an increased number of elderly persons alive today. These advances have a major effect on oral health. At one time ageing was inevitably associated with tooth loss. In a United States survey done in 1989 it was observed that 28.4% adults aged 65-74 years and 40.7% adults aged 75-84 years and over were edentulous[1]. Geriatric dentistry or gerodontics is a branch of dentistry that addresses the oral health needs of older adults and at one time, this branch was synonymous with complete dentures. This perception changed as is evident from the increasing number of "new elderly" who are better educated, healthier, maintaining their teeth and more demanding of dental services[2,3]. By retaining their teeth longer the risk for caries and periodontal disease persists. Root caries was seen in 18% of older adults.[4] Gingivitis and mild to moderate periodontitis are common.[5] Oral cancer is primarily a disease of older adults and its incidence increases with age, reaching a peak in those 65 to 74 years of age.[6]

Age related changes in oral cavity

Most changes in the teeth are not age related but due to incremental effects of wear, habit and disease. This is especially true for tooth surface and occlusal wear. The former is related to diet, occlusion, habits, occupation and enamel composition while the latter is due to attrition, abrasion (use of abrasive toothpastes or powders) or erosion. Erosion may be related to acid exposure in diet (pure fruit juices), medicines (Aspirin, Vitamin C) or as a result of acid reflux (esophageal reflux or hiatus hernia). Darkening of the teeth occurs with age as a result of extrinsic staining and thinning of enamel through abrasion thereby exposing underlying yellowish dentin. Age related changes in dentine produce vertically running hairline cracks. Regular secondary dentine formation reduces the volume of the pulp chamber and results in dentine sclerosis. Pulp loses its cellularity and vascularity, becomes more fibrous with development of dystrophic calcification in the form of pulp stones. With age, teeth may become less sensitive but more brittle and are at increased risk for fracture. Apical migration of the gingival margin exposes the entire anatomic crown and part of the cementum covered roots. The consequent exposure of dentin results in root caries. The oral mucosa becomes thin, smooth, dry and susceptible to injury. The tongue loses its filiform papillae and appears smooth. Mucosal atrophy may be related to dietary deficiencies. Taste is apparently affected but no uniform pattern is seen. A large secretory reserve of the major salivary glands results in adequate salivary flow despite age related loss of acinar elements. With age the lower jaw moves forward relative to the upper jaw 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 may become thin due to resorption and muscles of mastication undergo atrophy as do the associated muscular processes of bone. Alterations in mastication, swallowing and sensory function (taste and smell) occur with age as well as in relation to concurrent systemic diseases like stroke, Parkinson's disease or the use of antipsychotic medications. The healing capacity of healthy oral mucosa is not functionally impaired by ageing[7].

Age related disorders affecting oral cavity

Oral cancers cause serious morbidity and mortality in older adults. Majority of oral cancers (90%) are squamous cell carcinoma, and most cases occur in the over 60's age group. Tobacco, betel nut, pan-masala and alcohol are associated with an increased risk for oral cancer. Other predisposing factors include poor oral hygiene, malnutrition, and type of iron deficiency anemia such as Plummer-Vinson syndrome. Sun exposure is the most common risk factor for lip cancer. Unfortunately, oral cancers often are not diagnosed until the lesion is quite large and has metastasized. Oral cancer lesions occur most often on the undersurface

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and the lateral borders of the tongue, the retromolar area and the soft palate. A meticulous oral examination is essential to detect these cancers early. This screening examination should be conducted every year or two. A biopsy is considered mandatory for all suspicious white or red patches in the oral cavity[7,8].

Head and neck tumors are common in the elderly and often treated with radiation for 4 to 7 weeks, resulting in destruction of salivary glands in the radiation field and most of the blood supply to the bone. There is a high risk for osteoradionecrosis or bone destruction. Pretreatment with systemic hyperbaric oxygen should precede dental extraction within the radiation field. Mucositis causes considerable discomfort and interferes with nutrition during this crucial time. Generalized oral ulceration, certain bacterial, fungal, and even viral infections are common. Pretreatment of oral diseases before chemotherapy or radiation therapy is the most appropriate oral care for these patients. The optimal time for providing dental treatment is at the conclusion of a chemotherapy cycle when the patient's neutrophil count has begun to rebound. Neutrophil counts should be at least 1000/mm^3 and the platelets should be adequate. Maintaining good oral hygiene practices through out the course of any type of cancer treatment is imperative. Tooth brushing should continue unless bleeding becomes too severe. Chlorhexidine rinses during chemotherapy can help maintain a lower level of oral bacteria and helps in preventing Candidiasis and mucositis. Dentists must be vigilant for metastases of some cancers to the oral cavity and bone[9].

Burning mouth syndrome is a characteristic situation in the elderly who complain of burning sensation in the oral cavity. It may be related to food preservatives, flavoring agents, local denture trauma, diabetes, anemia, nutritional deficiencies and emotional instability. It may sometimes be reversed by estrogen therapy in postmenopausal females. This is one area where a medical practitioner must interact with dental colleagues in management[7].

Denture stomatitis may be seen in 60% of the elderly patients. This inflammatory lesion is a result of ill-fitting, poorly maintained dentures with superimposed yeast infection with Candida species. Painful lateral lip fissures as well as denture irritation hyperplasia are common in denture wearing elderly. While looking for predisposing factors for these like anemia, diabetes mellitus and deficiencies of vitamin B_{12} and folate one must instruct the patients to maintain their dentures. The dentures must be removed at night, cleaned and left in water overnight. Miconazole oral gel should be applied four times daily. The dentist should inspect them every 2 years and consider replacement every 5 to 10 years[7,10].

Systemic disorders and medications affecting oral health

The relative importance of various risk factors affecting oral health changes with age[11]. For older adults, systemic disease and medications play a far greater role in oral health than is true for the younger adults. The elderly are at risk for root caries because of poor oral hygiene, gingival recession and decreased salivary flow (usually drug related) .It is especially common around old or worn restorations[12]. Periodontal disease and gingivitis in the elderly are bacterially mediated. Poor oral hygiene and the use of certain medications increases the risk of gingivitis while gingival recession is mediated by poor oral hygiene, periodontal disease and dysfunctional habits. Ageing is not a major risk factor for these diseases but the inability to carry out daily oral hygiene like brushing and flossing in neurological or musculoskeletal diseases (Alzheimer's disease, arthritis or stroke) may predispose to these conditions[9,13]. Patients with chronic gastrointestinal problems may have a lower oral pH because of constant acid reflux leading to increased oral disease and erosion of teeth. Diabetics are more prone to severe periodontal disease due to gingival microangiopathy, altered polymorphonuclear leukocyte function and increased collagen breakdown. They may also have symptoms of altered taste, burning, dryness or gingival tenderness[7].

Drugs like phenytoin, nifedipine and cyclosporine may cause gingival overgrowth or hyperplasia. Sometimes a black hairy tongue may be seen as a result of antibiotic use[7].

A reduced immune response may increase the vulnerability of oral tissues to infection. A systemic disease like diabetes which compromises the immune system may result in oral candidiasis. It may also be seen in patients taking oral steroids, asthmatics using inhaled steroids or cancer patients on chemotherapy. Oral herpes may be seen in patients of pneumonia or those on immunosuppressive drugs.

Xerostomia is not a natural part of ageing. Salivary flow is maintained despite changes associated with ageing in the glands. Salivary flow will have decreased by at least 50% before a person becomes symptomatic. Its underlying cause must be identified. Many medications can cause xerostomia or dry mouth. Sedatives, opiates, antipsychotics, antidepressants, antihistamines, diuretics, and some antihypertensive medications are among the most common examples. Medications with anticholinergic activity neurologically reduce saliva flow. Other drugs may dehydrate the oral tissues, causing the sensation of oral dryness. In systemic diseases like Sjogren's syndrome,

autoimmune damage to the salivary and lacrimal glands occurs. Many insulin-dependent diabetic patients have xerostomia. Poor glycemic control and subsequent dehydration may cause this symptom. Dehydration is also more common in the elderly and probably contributes more to xerostomia than previously thought. With ageing, a decrease in the sense of thirst, increases the chances of dehydration. Radiation treatment for head and neck malignancies destroys salivary gland tissue within the radiation field. Oral dryness can begin as early as 2 weeks with the radiation treatment. Xerostomia results in rampant dental caries, loss of fillings, poor denture fitting, ulcers, glossitis, parotitis, stomatitis, candidiasis and other mucosal infections. Its management can be divided into two categories: (1) treatment of hypo salivation, aimed at increasing the flow of saliva from the gland; and (2) palliative treatment aimed at relieving the symptoms caused by xerostomia. Proper hydration is an important element in stimulating salivary flow, since saliva is mostly composed of water. Palliative treatment provides comfort for the patient during oral dryness. Salivary substitutes, lubricant mouth wash (2% methylcellulose) and frequent sips of water can be provided as needed. Patients should avoid foods and beverages that contain caffeine and products containing alcohol that are dehydrating to the body. Salivary stimulants, chlorhexidine rinse, fluoride toothpastes or gels (1.1% sodium fluoride = 5000 ppm fluoride) 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[14,15].

Medical problems that influence dental treatment decisions

Optimal treatment planning for older adults requires an understanding of the overall health of the patient, relationship between any systemic problem and the patient's oral health.

Hearing and vision impairment may hinder the patient's ability to understand the dental plan or even the ability to travel to the dental office.

Senior patients are more likely to be taking medications which affect dental treatment. Aspirin may reduce platelet aggregation resulting in possible excessive bleeding during dental surgery. Antibiotics (long term- 7 days or more) may reduce intrinsic intestinal bacteria levels with resultant reduced vitamin K which may increase warfarin levels. NSAIDs may increase warfarin levels, resulting in excessive bleeding. Antihistamines may cause dry mouth while phenytoin, cyclosporine and nifedipine cause gingival hyperplasia. As some patients may be on oral anticoagulants (OAC), 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 reinstituting it as soon as possible after surgery. Low molecular weight heparins have an advantage that monitoring of coagulation parameters (aPTT) 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. In simple treatment of dental caries or dental prophylaxis there is no need to stop OAC. Aspirin may be stopped one week before the surgical procedure and restarted as soon as possible after surgery[9,15,16].

In patients with congestive heart failure, adaptations in treatment and planning of dental care should include strategies to maintain comfort and to reduce stress. Appointments should be kept short and particular effort should be made to control anxiety. Supplemental oxygen must be available. The patient may be unable to tolerate a reclining position in the dental chair. Coronary artery disease includes angina, unstable angina and myocardial infarction (MI). It may lead to sudden death. Patients who have angina should be assessed to determine the severity of their disease. The patients should bring their medications during each appointment. Anginal pain sometimes radiates to the jaw, giving the sensation of a toothache. Patients should not undergo elective outpatient dental care until at least 6 months after an MI because of the increased risk for angina, arrhythmias, or another MI while in the dental chair. An opinion of the treating cardiologist must be taken prior to any treatment[9].

Prophylaxis for infective endocarditis is essential if the elderly patient has previous endocarditis, a prosthetic valve or implant or valvular heart disease. Negligible risk is posed by mitral valve disease without regurgitation, atherosclerotic plaques, coronary artery disease, syphilitic aortitis, and cardiac pacemakers. The standard prophylaxis for dental procedures is 2 gm amoxycillin given 1 hour prior to the procedure or if the patient is allergic to penicillin, 600 mg clindamycin may be used[17].

Joint replacement is common in the elderly. If a patient has a prosthetic joint antibiotic premedication before an invasive dental procedure is indicated.

However, for patients whose prosthetic joint has been in place for 2 years or longer and who have no other risk factors, antibiotic premedication is not warranted[18].

Alzheimer's disease is seen primarily in persons older than age 65. Special attention should be given to these patients because of failure of mental function combined with continued mobility. Oral health need not decline simultaneously with cognitive decline but oral health care is imperative in the early stages of the disease. These patients often have an increased penchant for foods and beverages with high refined-sugar content. Eating is one function that most dementia patients retain interest in until the late stages of the disease and family members and caregivers often give the patient comfort foods to satisfy the patient's desire. Constant snacking and bathing the teeth in fermentable carbohydrates often leads to rampant caries. A dental referral should be obtained by the medical specialist as soon as possible after the diagnosis is made. Caregivers or nursing staff should be instructed to dispense sweets only at two or three specific times during the day. The patient should also be encouraged to rinse or drink water after eating the sweets. Preventive measures such as a high-fluoride toothpaste and good oral hygiene are the best options these patients have for avoiding oral tissue breakdown. As the disease progresses, patients become less competent at self-care so the treatment plan must be practical, taking into account the fact that eventually caregivers will be providing daily oral hygiene[19].

Parkinson's disease is chronic and progresses slowly. Patients with advanced Parkinson's may have difficulty transferring from wheelchair to dental chair. Planning should take into account the anticipated neurological decline including dementia. An aggressive preventive and restorative approach is essential. Medications for this disease are often associated with dry mouth, and simple oral hygiene becomes difficult. Preventive therapies should include oral care that is easy to perform, high fluoride toothpaste (1500 to 5000 ppm) and fluoride containing restorative materials. Use of a bite block may be helpful during dental treatment, as will use of a rubber dam. Cerebrovascular accident (CVA) or stroke is a major cause of disability among persons older than age 65. For those who survive a stroke the effects can be both devastating and long lasting. These can result in oral disease and any previous levels of oral dysfunction may be intensified. As a general rule, it is best to wait at least 6 months after a stroke before beginning any elective dental treatment. Muscle weakness often follows a stroke and may affect the muscles in and around the oral cavity. If the facial nerve is involved, the muscles of facial expression may be impaired causing pouching or food packing in the oral cavity. In addition, the stroke patient may lose the ability to clear the food with the tongue on the affected side. As a result, heavy debris may build up making the oral environment susceptible to bacterial overgrowth. When considering replacement of a removable prosthesis, delaying it until maximum muscle strength has returned will help ensure a better fit. If the patient has lost some or all use of the dominant hand, both patient and caregiver should receive instructions on modified oral hygiene techniques. An antimicrobial rinse may be prescribed for use during the first few months to prevent tissue infection and to help stabilize the oral environment. Instruct the patient to rinse after each meal to clear any food and debris that may result from pouching. Special consideration must be given to patients with aphasia. Use of simple short instructions, yes or no questions, giving extra time to respond, communication with writing or visual cues and not overreacting are some ways of dealing with the problem. In patients with dysphagia there is a major risk of aspiration and therefore a minimum of oral irrigation should be used while keeping the patient upright, using antimicrobial rinses, having frequent breaks, using a slow speed handpiece, a rubber dam and avoiding ultrasonic scalers[9].

Optimizing dental health in elderly

Promotion of dental health in the elderly is the responsibility of the all medical professionals and administrators. The presence of 20 teeth is an oral health goal of the W.H.O.[20]. The large gap between the dentist's assessment and the elderly patients perceived needs for dental care has to be bridged by planning innovative geriatric dental health education and preventive as well as curative services.

Innovations in toothbrushes, interdental cleaning and other oral care products

Many older adults have difficulty achieving effective daily plaque control. In response to this need, manufactures have developed and marketed a variety of toothbrushes. Various bristle and handle designs are available in either manual or powered (electric or sonic) brushes. Powered brushes have heads that clean groups of teeth (traditional brush head) or one tooth surface at a time. 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 an electric flossers are available[9].

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 every 3 to 6 months[9]. Diabetic patients undergoing oral or periodontal surgery may benefit from a chlorhexidine mouth rinse after surgery. Chlorhexidine rinses are recommended for confused and physically handicapped elderly people. Some over the counter phenolic mouth rinses are not as good as chlorhexidine[21].

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 1000-2500 ppm[22]. The advertising by oral care industry that twice daily brushing is a socially desirable and beneficial activity will go a long way in improving oral health. The use of oral dentifrices containing 5000 ppm fluoride results in effective remineralization of root caries in the elderly. The fluoridation of public water supplies remains an inexpensive way of promoting oral health.

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[23].

The aim of dental care is a healthy and functional dentition providing good esthetics and speech. In the elderly anterior teeth and premolars are essential for these functions so the dentist should preserve them. Dental implants are designed to look like teeth and are useful only for patients with enough bone structure. A medical evaluation of patient is important in implant dentistry because systemic conditions may influence treatment. The patient's general health, manual dexterity and medical status should allow use of endosseous dental implants. They are contraindicated in patients suffering from mental impairment, schizophrenia and with bruxism or personality disorder[24].

Dietary assessment should be part of the caries risk analysis. Older adults often increase their intake of refined carbohydrates so assessment should include a review of any possible hidden sugars, including those found in over the counter medications. Patients are often unaware that many of these compounds such as antacid tablets contain higher sugar content and the contact with teeth is prolonged by allowing them to dissolve in the mouth. Sugar-based substances should be avoided whenever possible. When it is not possible or practical to eliminate these sources, less cariogenic alternatives should be substituted. Dehydration may be a result of poor intake of water. Older adults should be encouraged to drink water or liquids containing water throughout the day as increased hydration has multiple health benefits, including decreased caries risk[9].

Interdisciplinary Geriatric Health Care Team

Care of home-bound patients or those in institutions and nursing homes requires interdisciplinary and coordinated efforts of medical, dental, nursing staff, social workers, occupational therapists and paramedical staff with use of mobile and portable dental care units.

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 issues that may affect the delivery of treatment.

Conclusion

The dental treatment plan for the elderly should be designed to establish and maintain optimum oral health. A full range of dental services should be offered to the patient regardless of their chronological age. Cosmetic and esthetic dental services offer older adults the opportunity to improve their older smile and enhance their self-esteem. Some of the elderly become frail and limited in their capacity for self-care, so the dental professionals should educate patients, caregivers and other health professionals about the value of maintaining good oral health throughout life.

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