Oral Health Reflects the General Health of Elderly

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Abstract

The condition of the mouth cavity can cause major alterations in the body's organ systems. Changes in the oral cavity in the elderly are related with hard tissue structure and soft tissue such as dentition, temporo-mandibular joints, salivary glands, maxillofacial muscles, and oral mucosa.

Most oral health concerns mirror general health, including systemic, hormonal, renal, and respiratory disorders, particularly in the aged.

This article focuses on the most recent research on the association between elderly general health and oral health. Collaboration between doctors and dentists is required for early detection of prevalent diseases through changes in oral health, particularly in the elderly.

As a result, diagnoses can be made swiftly, precisely, and painlessly, saving the lives of many old people.

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Introduction

The steady loss of physiological integrity characterizes biological aging. It causes functional alterations and raises illness vulnerability. The oral cavity tissue is presumed to be the primary place of pathogenic initiations, which will likely spread to other locations in the body. Because biological activities are reduced, numerous oral bacteria can spread quickly throughout the body. Bacterial infections in the oral cavity are typically dominated by anaerobic bacteria linked to blood flow, facilitating bacteriemia. Under normal settings, the oral barrier system, which includes the physical / epithelial barrier, defensins, immunity, electricity, and phagocytes / reticulo-endothelial system, works together to inhibit and destroy germs that infiltrate the tissues. When the equilibrium is upset, the organism can spread and cause acute and chronic infections of varying severity[1,2].

The aging process causes significant changes and degradation in oral cavity function. The deterioration could be caused by a variety of factors, including the accumulation of waste in body cells, the decrease of organ physical qualities, and the lubrication of various organs. Some oral health issues have been scientifically linked to general health issues, and vice versa Changes in elderly people's oral health include increased caries prevalence and root retention, periodontal disease, tooth mobility and loss, decreased salivary secretion, oral mucosal peeling, tongue papillae shortening, temporo-mandibular joint (TMJ) disorders, and even oral cavity cancer[3,4].

The purpose of this article is to investigate the relationship between dental health and general health in the elderly. Dental and oral health are indicators of overall health. As a result, beyond basic clinical assessment, a combined frequent dental and health check-up is required so that initial oral health disorders or even general health can be adequately diagnosed.

Changes in Oral Tissue of the Elderly

Chronic illnesses of the oral tissues, such as dental infections (caries, gingivitis, periodontitis), tooth loosening and loss, mucosal lesions, and oral cancer, are more common in the elderly. Generally. In truth, this steady decline of functional capacity is curable. The host's response to bacteria in plaque, as well as the extent of periodontal damage, might be affected by structural and functional changes that occur as we age. Plaque retention and gingival

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recession cause cementum to be more easily exposed to plaque and the attachment plaque to become wider in the elderly. Exudate flow from inflamed gingiva and reduced salivary flow both promote plaque microbe development and multiplication[5].

Periodontal disease in the elderly is not a distinct disease, but rather the result of chronic inflammation since adulthood. Periodontal disease severity in the elderly is frequently connected with dento-gingival bacterial plaque exposure to periodontal tissue. Periodontal disease, in addition to being caused by plaque, can be influenced by other disorders in the body. Periodontal disease can harm the elderly in three ways: by the transfer of germs into the bloodstream, the effects of inflammatory mechanisms, and systemic disorders in the oral cavitydarb[2,5]. Proinflammatory cytokines TNF-, IL-1, and gamma interferon, as well as prostaglandin E2 (PGE2), will increase in periodontitis. Proinflammatory mediators have the potential to enter the bloodstream and have systemic effects. Individuals who have a high risk of periodontitis may also have a high risk of other systemic diseases such as cardiovascular disease (infarction), respiratory disease (pneumonia), kidney failure, and so on. Premature births and babies with very light birth weights can also be caused by mediators arising from damaged periodontal tissue[1,5].

Physical, chemical, thermic, and pathogenic bacteria can all be used to stimulate the oral mucosa. The mucosa of the elderly is relatively resistant to harm, which increases the risk of many diseases. Extrinsic and intrinsic variables can also produce mucosal disease. Intrinsic factors include mucosal aging, which produces epithelial tissue fragility; immuno-senescence, which causes a diminished host response to pathogens and an increase in autoimmune disorders; and salivary gland aging, which causes a loss in protective function[1,6].

Extrinsic factors such as polypathology and polymedication, starvation, deterioration, oral hygiene, and an increase in the number and variety of infections all contribute to changes in oral ecosystems as people age. As a result, the elderly are predisposed to oral mucosal illnesses such as inflammation, bacterial or fungal infections, ulceration, autoimmune dermatoses, tumors, or even cancer[7].

Because of the loss of the filiform papilla, the tongues of the elderly normally become smoother and more shiny, and sublingual varices may appear. Furthermore, sensitivity to numerous pathological disorders, such as candida infection, increases, and the rate of wound healing decreases. As a result, the tongue surfaces of the elderly are frequently coated with various degradation products of keratin, food scraps, germs, and leukocytes, which are linked to the tongue papillae. Taste perceptions are commonly lost in the tongue. This is because to a shift in the gustatory membrane, which alters the function of ionic canals and receptors[8].

Temporo mandibular Joint / TMJ. Neuromusculoskeletal diseases (TMD) are abnormalities with joint structures, jaw muscles, and nerves that can affect the elderly. TMD in the elderly often refers to changes in tooth position and structure (due to tooth replacement, dental thinnes, or dental treatment treatments), traumatic joint or cartilage, jaw, head, or neck injury[9]. Furthermore, arthritis, particularly osteoarthritis, rheumatoid arthritis, gout, and osteoporosis, can wreak havoc on these joints[10]. Thus, temporomandibular joint abnormalities in the elderly are commonly used to make myogenic and hydrogenic diagnosis[9].

Secretion of saliva. Elderly persons often have atrophic salivary tissue atrophy, ductal element proliferation, and certain degenerative alterations in the major and small salivary glands, resulting in decreased salivary gland output[11,12]. Xerostomia occurs in the majority of elderly patients with dementia[13,14].Saliva protects the oral cavity, upper respiratory system, upper digestive organ, and facilitates different sensomotoric phenomena. The biggest issue with oral health in the elderly is salivary gland problems such as dry mouth (xerostomia) and dental caries. Diseases such as endocrine problems, diabetes, rheumatologic disease, or the use of certain medicines (psychotropic drugs) can also cause xerostomia. The results of the study explained that Ig A in the saliva of elderly patients with white lesions increased[15].However, the salivary gland is thought to have functional reserve capacity, allowing it to maintain steady fluid secretion throughout maturity[16,17].

Cardiovascular disease. Periodontal disease plays a significant influence in cardiovascular disease. Oral bacteria that cause inflammation emit lipopolysaccharides

(endotoxins), which can enter the bloodstream and cause bacteremia, damaging the endothelium directly and leading to atherosclerosis[18].

Anemia. Iron deficiency anemia is the most frequent kind of anemia among the elderly. Burning feeling in the oral mucosa, lingual varicosity, dry mouth, oral lichen planus, and atrophic glossitis (loss of tongue papillae) (26.7%) are all symptoms of anemia in the oral cavity. This results in a soft, reddish tongue with pale mucous and angular cheilitis, similar to migratory glossitis (geographic tongue). This disorder causes reddish, non-indurated, atropic lesions that are confined by a small elevation of the tongue and visible margins ranging in color from gray to white. The region does not have white keratotic boundaries in atropic glossitis and tends to grow rather than shift location. Burning mouth sensation in the oral mucosa (76.0%), lingual varicosity (56.0%), dry mouth (49.3%), oral lichen planus (33.3%), and atrophic glossitis (26.7%) are more common in patients with iron anemia [33]. Anemia is frequently the initial sign of multiple myeloma. Multiple myeloma induces immunosuppression, which leads to infections including oral hairy leukoplakia and candidiasis. Macroglossia is caused by amyloid deposits on the tongue. Swelling and osteolytic lesions are the most prevalent clinical and radiographic symptoms of multiple myeloma in the jaws[19].

Oral Leukemia. Gingival hypertrophy, petechie, echimosis, mucosa ulcer, and hemorrhage are common illness consequences. Numb chin syndrome is a rare symptom caused by mental nerve neuropathy. Mucormyosis cavum nasalis and sinus paranasalis can be referred to as pallatum ulceration and necrosis. Septicemia can be caused by oral bacterial infections. Chemotherapy for leukemia can cause reactivation of the Herpes Simplex Virus (HSV), which can lead to mucositis. However, mucositis caused by chemotherapy can develop without HSV reactivation due to mucosal surface peeling and/or bone marrow suppression, resulting in opportunistic organism invasion[20,21].

Myeloma Multiplex. This disease can affect the oral cavity in the form of secondary symptoms of the jaw, particularly the mandible, causing jaw swelling, discomfort, leaking, loose teeth, and pathological fracture. A typical radiograph shows punched out lesions of the skull and jaw. Multiple myeloma induces immunosuppression, which leads to infections including oral hairy leukoplakia and candidiasis. Macroglossia is caused by amyloid deposits on the tongue. Swelling and osteolytic lesions are the most prevalent clinical and radiographic symptoms of multiple myeloma in the jaws[19].

Hormonal Diseases

Diabetes Mellitus / DM. Diabetes is one of the most frequent hormonal illnesses in the elderly. In general, the oral symptoms of DM patients are influenced by age, length of illness, and level of metabolic management. Approximately one-third of diabetic patients complain of xerostomia, which is caused by reduced salivary flow and increased salivary glucose. Enlargement of the hard and diffuse bilateral parotid glands is possible. Even though glucose metabolism is tightly controlled, this process is irreversible [2,18].

Uncontrolled DM patients, in fact, experience taste alterations, mouth burning syndrome, decreased collagen production, and glycosaminoglycans, which encourages crevicular fluid collagenolitic activity, resulting in the release of periodontal fibers[2]. Candida albican opportunistic infections are easily caused by dry and injured mucosa. Diabetes patients also have poor wound healing, xerostomia, plaque accumulation, and food scraps, susceptibility to infection, linked gingival hyperplation, and general horizontal alveolar bone resorption. As a result, teeth can easily become loose and subsequently vanish, increasing the risk of periodontal disease. Periodontitis, in fact, can aggravate diabetes and impair glycemic control [18].

Hypoparathyroidism. Hipocalcemia is caused by low parathyroid hormone levels. When the facial nerve just below the procceesus Zygomaticus is tapped, the upper lip twitches, which is a common symptom of hypocalcemia. Email hypoplation and failure of tooth eruption can occur if hypoparathyroidism begins early in childhood, during the process of odontogenesis [22] .

Hyperparathyroidism / HPT. Serum HPT levels rise, causing hypocalcemia, hyperphosphatemia, elevated alkaline phosphatase, and accelerated bone turnover. As a result, alterations in bone and teeth mineralization occur. The early oral signs are prolonged jaw discomfort (14.0%), mouth pain / neuropathy (11.7%), asymmetry or facial edema,

periodontitis, and tooth movement [23]. Mandible fractures are more common than maxillary fractures, with general presentations in the form of bimaxillary. Brown tumors, soft tissue calcifications, dental abnormalities (delay or halt of tooth growth and development), tongue paresthesia or lips, and alterations in face muscles are some of the other common oral signs of hyperparathyroidism (HPT) patients[24,25].

Furthermore, radiographs show that the lamina dura has been lost around the tooth root, as well as diminished trabecular density and typical pattern blur. These lesions have unilocular or multilocular radiolucency (preferred), but they also harm the clavicles, ribs, and pelvis. These lesions can remain for a long time and can cause true cortical enlargement. These lesions are defined histologically as a proliferation of severe vascular granulation tissue that allows multi-nucleated osteoclast-type giant cells to form, which is identical to other lesions classified as central giant cell lesions in jaw mobility [23].

Hypercortisolism. Hypercortisolism, often known as Cushing's syndrome, begins with a steady increase in blood glucocorticoids. It also refers to another corticosteroid medication or endogenous adrenal overproduction. Hypercortisolism can also be caused by an increase in adrenocorticotropic hormones (ACTH) in comparison to pituitary tumors. Moon facies are defined as an accumulation of fat tissue in the area of the face. Pathological mandible fractures, maxilla fractures, and alveolar bone fractures can also arise as a result of a mild traumatic impact caused by osteoporosis. As a result, healing of alveolar bone fractures and soft tissue after tooth extraction becomes more difficult [26].

Hypoadrenocorticism.

Hypoadrenocortism occurs when adrenal corticosteroid hormone production decreases due to adrenal cortex injury, often known as Addison's disease. It is an autoimmune disorder that can be caused by diseases such as tuberculosis, tumor metastases, amyloidosis, sarcoidosis, or hemochromatosis. Orofacial and hyperpigmented bronzing appear on the skin and mouth mucosa. It happens when the levels of beta lipotropin or ACTH rise, both of which can stimulate melanocytes. Oral mucosal melanosis precedes the skin change. Brownish, diffuse pigmentation or patches are most common in the buccal mucosa, although they can also arise on the mouth floor, ventral tongue, and other areas of the oral mucosa [27].

Gastrointestinal Diseases

Gastrointestinal Diseases vary. Inflammation (such as Crohn's disease and ulcerative colitis), genetics (such as Gardner's syndrome), hypersensitivity (such as Celiac diseases), infection (such as peptic ulcers diseases), and other causes (such as gastroesophageal reflux disease / GERD) can all cause gastrointestinal diseases. Recurrent reseptor stomatitis (RAS), angular cheilitis, chronic submandibular lymphadenopathy, Sicca syndrome, halitosis, tooth caries, candidiasis, dysphagia, glossitis, and lichen planus are the oral symptoms of Crohn's disease. Ulcerative manifestations of colitis are painless intraepithelial microabses (pyostomatitis vegetans) in a straight line or winding in the tongue mucosa, soft palate, ventral tongue, erythema in the soft palate and uvula, epithelial atrophy, and xerostomia. Recurrent Aphthous Stomatitis (RAS), dental enamel abnormalities, delayed tooth eruption, atrophic glossitis atrophy, and angular chelitis are all oral symptoms of Celiac Disease (CD). Oral symptoms of GERD include tooth erosion, burning in the mouth, and oral aphthous stomatitis [28]. There is also pyostomatitis gangrenosum. It is another significant variation, with a devastating and long-lasting ulcer that results in significant scar tissue [29].

Pulmonary Diseases

Aspiration Pneumonia is a condition caused by bacterial aspiration in the mouth. This condition is a leading cause of death among the elderly who are prone to swallowing difficulties[30] . The oral microbial communities ingested with saliva appear to be dominated by microbiota on the tongue and periodontal bacteria. The primary sources of oral microbiota (aerobic and anaerobic) for this condition are various locations of the tongue. Microbiota and epithelial cell desquamation promote the discharge of resident bacteria into saliva. Elderly adults with multiple cavities and tooth remains often have poorer dental and oral hygiene, allowing more pathogens to enter their bodies. Aspiration pneumonia is characterized by increased tongue surface coating generated by bacteria in toothless elderly. Patients with this feature have increased mucus content, epithelial cell hyperplasia, and wall thickening in the tubes of minor respiratory ways, which exacerbates the situation of respiratory

way obstruction. This is especially hazardous to respiratory health[31].

Renal Failure

Chronic Renal Failure (CRF) is one of the diseases that manifests with typical oral signs, such as Uremic Stomatitis (chemical irritation caused by ammonia compounds generated by salivary urease hydrolysis of urea). It can be identified by the smell of ammonia or urine in the patient's breath. Dry mouth, taste change, halitosis, mucosal petechiae and ecchymosis, renal osteoporosis (bone demineralization with circulation and cortical loss, giant cell radiotransparencies or metastatic calcifications of soft tissues), candidiasis, mucosal lesions, periodontal disease, oral malignancy, and increased calculus formation are common symptoms[2]. Oral mucosal pallor under anemic conditions (deficiency in erythropoietin production) is one of the most prevalent presentations in hemodialysis patients, followed by bleeding tendencies, infections, hypertension, and dysgeusia. The clinical presentation is occasionally similar to oral leukoplakia. There are four forms of uremic stomatitis: erythemopultaceous, ulcerative, hemorrhagic, and hyperkeratotic. Fusobacterium, spirochaeta, and candida are the most common bacteria detected in the oral mucosa[32].

Autoimmune Diseases

Oral manifestations of autoimmune connective tissue diseases include systemic lupus erythematosus (SLE), systemic sclerosis (SSc), rheumatoid arthritis (RA), and Sjögren's syndrome (SS). They have aberrant structures or functions in one or more connective tissue elements such as collagen, elastin (and cells), or mucopolysaccharides [33,34].

Rheumatoid arthritis (AR) frequently affects the temporomandibular joint. It frequently refers to condylus erosion, which causes restricted mandibular movement followed by pain when moved. Patients with rheumatoid arthritis may also experience dry mouth and enlarged salivary glands[10]. Furthermore, AR can lead to lower salivary flow rates, worse oral hygiene, increased bacterial plaque deposition, and periodontal disease[34,35].

Syogren's Syndrome (SS) is characterized by xerostomia and parotid gland enlargement. Rheumatoid arthritis is typically related with SS, whereas Xerostomia is connected with Fissure tongue, depapilation and redness on the tongue, Cheilitis, and Candidiasis. Because of persistent xerostomia, swallowing and talking become difficult. Because SS can develop quickly, it must be recognized as soon as possible[33,34].

Lupus Erythematosus (LE), there are two types of lupus erythematosus: discoid lupus erythematosus (DLE) and systemic lupus erythematosus (SLE). DLE lesions typically begin as an irregular vaginal discharge area that later spreads to the periphery. Following its extention, the core section of the area turns red and develops an ulcer, while the edges rise and become hyperkeratotic. Both clinically and histologically, this DLE disease resembles lichen planus lesions. Ulcerations are histological markers that distinguish both. However, this ulceration does not produce discomfort and just affects the palate. Ecchymosis and petechiae are examples of purpuric lesions. More than 30% of SLE patients have salivary gland involvement, which promotes subsequent shogren's syndrome and severe xerostomia [33,34].

Scleroderma (Progressive Systemic Sclerosis) is an autoimmune illness that causes skin hardening and thickness, as well as organ abnormalities in the skin, gastrointestinal tract, heart muscle, lungs, and kidneys. Scleroderma patients' lips wrinkle as a result of mouth constriction, making mouth opening harder. Dysphagia and mouth burning are two of the disease's symptoms. The oral mucosa becomes pale and rigid, and numerous telangiectasias may develop. The tongue loses mobility and becomes smooth, with palatal rugae flattening. Salivary gland function can decline, but not to the extent of Syrenren's syndrome. On radiographic pictures, periodontal ligaments frequently seem swollen [33,34].

Tumor. Tumors frequently spread to the jaw as opposed to the soft tissue of the mouth cavity. Tumors in the jaw are frequently discovered when patients complain of swelling, discomfort, or paresthesia after the tumor has migrated to the soft tissues. In general, breast is the most common initial tumor site for metastasis to the jaw, whereas lung is the most common primary tumor location for metastasis to the soft tissue of the oral cavity. The most common main location for metastases to the jaw or soft tissues of the oral cavity in male patients is the lung. The mandibular molar region is the most prevalent site of metastases[24,33,34,36].

In addition to the aforementioned illnesses, many other anomalies in the oral cavity linked with general health have yet to be recognized. As a result, good collaboration between doctors and dentists will help to recognize disease symptoms in the body and the mouth cavity. Furthermore, collaboration can help to facilitate and hasten the detection of anomalies in the body.

Conclusions

The physical state of the mouth cavity can reveal symptoms of a certain disease in the body. As a result, a better understanding of the specific indicators of an illness, particularly in the oral cavity, is required. Furthermore, prospectively updated collaboration between dentists and doctors will most likely support new findings on specific aspects of a specific disease in the oral cavity. As a result, diagnoses can be made swiftly, precisely, and painlessly, saving the lives of many old people.

Declaration of Interest

The authors report no conflict of interest.

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