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Medical Health and Medication Use in Elderly Dental Patients

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Abstract

The objectives of this study were to obtain information on the medical conditions and medications used among elderly Thai dental patients and to investigate the relationship between the findings in relation to age and sex. The information regarding medical conditions and medication use was obtained from interviews of 510 dental patients aged 60 years and older. The incidence of medical conditions was 82.5%; women had a significantly higher incidence of medical conditions (86.5%) than men (76.5%). The incidence of medical conditions did not differ among the three age groups. Overall, cardiovascular disease was the leading problem (33.7%) with hypertension being the major component (26.1%). The prevalent problems were bone/joint disorders (32.4%), allergies (18.2%), diabetes mellitus (14.5%), and eye and ear problems (14.3%). In our sample, 65.5% reported taking medications, with an average of 1.5 drug groups per person. The average number of medications taken increased as age increased. Women took medications more frequently than men (70% vs. 58.5%). The four most prevalent drugs were cardiovascular agents (32%), endocrinologic drugs (14.5%), nutritional therapeutics (12.9%), and drugs acting on the musculoskeletal system (11.4%). The present study supports the findings of previous reports in that the presence of medical conditions is high in the elderly and the incidence of medication use increases with advancing age.

Keywords: Medical conditions, medications, elderly, dental patient

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Introduction

The elderly are increasing in numbers and have a longer life expectancy in most parts of the world. In addition, older adults are now visiting their dentist more frequently than in the past. Thus, dentists will be treating more elderly patients in the future. It is important dentists be aware of the common medical conditions and medications taken by the elderly. Dentists must be aware of complications or danger to life that may occur during dental treatment. A thorough medical history is basic to understanding a patient's total health.[1] Therefore, taking a careful medical history before undertaking any dental procedure is mandatory in order to provide appropriate care for these older patients. Some systemic diseases may influence oral health and/or dental treatment to some degree, and conversely dental treatment may have an influence on some systemic conditions. Loesche et al.[2] stated medical health and oral health are linked. Several recent studies have shown a correlation between dental or periodontal infections and cardiovascular or cerebrovascular disease.[3-6]

Surveys indicate a high prevalence rate of medical conditions in the elderly and age appeared to be a significant factor.[7-9] Cardiovascular disease was the most prevalent group of disorders reported in the elderly.[7,9,10] Other common disorders include endocrine problems, arthritis, respiratory diseases, gastrointestinal diseases, blood diseases, neurological disorders, vision defects, and impaired hearing.[10-13] Among cardiovascular diseases, hypertension is the most frequent disorder experienced by the elderly.[9,10] With reference to endocrine disorders, diabetes mellitus and thyroid disease are the most common ailments. Vision defects and impaired hearing have been associated with advancing age. The three most common conditions causing vision loss in the elderly are senile macular degeneration, glaucoma, and cataracts.[14] Sensory neural hearing loss is a common phenomenon, which may lead to significant communication problems in older people.[15]

Elderly patients tended to have more chronic health problems and consume more medications than other age groups.[16,17] Steen[15] stated most chronic diseases are age-dependent, and the prevalence of related drug treatment increases with advancing age. Also, multiple drug use increases significantly with advancing age.[1,16,18,19] Galan et al.[11] reported 90% of older Canadian dental patients were taking at least one medication, most of which were analgesics, diuretics, and gastrointestinal agents. Landahl[20] reported the most common medications at age 70 were anxiolytics, diuretics, analgesics, and digitalis; at age 82 common drugs included analgesics, anxiolytics, diuretics, and laxatives. Hale et al.[21] reported the average number of drug categories used simultaneously increased with age; the most common drugs reported were antihypertensive agents, cardiovascular drugs, vitamins, and analgesics. The elderly were almost always on long-term drug therapy, frequently involving multiple drugs. Therefore, they were more likely to have adverse drug reactions.[16,19,22,23] These adverse drug reactions can affect the oral cavity. For example, psychotropic agents, antihistamines, and diuretics dry the oral mucosa and cause xerostomia. It has been shown the use of cardiovascular agents and psychotropic medications reduced salivary flow with statistical significance.[24] Lichenoid reactions may be induced by antihypertensives, hypoglycemics, and non-steroidal anti-inflammatory drugs. Table 1 lists the most common adverse effects of dental significance associated with the most frequently taken drugs by dental patients.[16,19,25]

Because of the reported high prevalence of medical conditions and medications used in the elderly, understanding the most common conditions is important for dental management. The objectives of this study were to obtain information on the medical conditions and medications used among elderly Thai dental patients and to investigate the relationship between the medical conditions and medications used in relation to age and sex.

Subjects and Methods

The incidence of medical conditions and medication used was determined from a sample of 510 Thai patients attending the Oral Diagnostic Clinic at Chulalongkorn University Dental School for an oral examination and a dental treatment plan. The study sample included patients who were 60 years of age and older. All subjects were

Table 1. List of medications with possible adverse effect of dental significance.[16,19,25]

Adverse Effect	Drug or Drug Classes
Abnormal hemostasis	Aspirin, coumarin anticoagulant, dipyridamole, NSAIDs, methyldopa phenytoin, quinidine
Altered host resistance	Antibiotics, insulin, oral hypoglycemics, systemic corticosteroids
Altered hematopoiesis	Barbiturates, chloramphenicol, gold salts, phenothiazines, trimethadione, tolbutamide
Decreased stress tolerance	Beta-adrenergic blockers, calcium channel blockers, cardiac glycosides, corticosteroids, nitrate preparations
Erythema multiforme	Antibiotics, carbamazepine, chlorpropamide, H 2 -blockers, isoniazid, rifampin, phenytoin
Gingival overgrowth	Calcium channel blockers, cyclosporine, phenytoin
Lichenoid drug reactions	Antibiotics, antihypertensives, chlorquine, diuretics, gold salts, immunosuppressive agents, methyldopa, NSAIDs, oral hypoglycemics, para-aminosalicylic acid, penicillamine, phenothiazines
Lupus erythematosus	Antibiotics, hydralazine, isoniazid, methyldopa, nitrofurantoin, phenytoin, primidone, procainamide, rifampin, thiouracil
Reduced amount of vasoconstrictor	Beta-adrenergic blockers, cardiac glycosides, phenothiazines, tricyclic antidepressants
Respiratory depression	Barbiturates, muscle relaxants, narcotics, sedative-hynotics
Taste disturbance	ACE inhibitors, benzodiazepine, fenobrufen, griseofulvin, inhalers, levodopa, metronidazole, penicillamine, sulindac
Xerostomia	Anticholinergics, antidepressants, antihistamines, antihypertensives, antineoplastics, antiparkinsonians, antipsychotics, antispasmodics, bronchodilators decongestants, diuretics, narcotics, NSAIDs, transquilizers

interviewed for their medical history and medications by one investigator. In cases of poor historians, additional information was obtained from the subjects' family members. If possible, the investigator verified the medications the subjects were prescribed by checking the container label. Eighteen categories of medical conditions and 14 categories of medications were identified. Medications were grouped according to the 1999 Thai National Drug List, which was classified by the pharmacologic and therapeutic effects of the listed drugs. The Pearson chi-square was used to test the differences in the incidence, types of medical conditions, and medications in relation to age and sex. P values lower than 0.05 were considered statistically significant.

Results

The sample of 510 elderly Thai subjects included 200 (39.2%) men and 310 (60.8%) women, who were divided into three age ranges: 60-64 years (32%), 65-69 years (37.3%), and 70 years and older (30.8%). The average age for men was 67.8±5.6 years and for women 67.2±5.3 years.

Medical Conditions

Table 2 shows the incidence of medical conditions found in this elderly group. The overall incidence was 82.5%. Women were affected by a significantly higher incidence of medical conditions than men (85.6% vs. 76.5%; P = 0.004). The incidence of medical conditions showed a trend which increased with age: 78.5% in the 60-64 year group, to 81.6% in the 65-69 year group, and to 87.9% in the 70 year and older group (P = 0.079).

Table 3 shows the distribution of various medical conditions in relation to sex. Overall, cardiovascular disease was the leading problem (33.7%),

Table 2. The incidence of medical conditions in elderly dental patients.

Age group * (years)	Diseases/Disorders			No Diseases/Disorders		
	Men ** n (%)	Women ** n (%)	Total n (%)	Men n (%)	Women n (%)	Total n (%)
60-64	47 (9.2)	81 (15.9)	128 (25.1)	14 (2.7)	21 (4.1)	35 (6.9)
65-69	55 (10.8)	100 (19.6)	155 (30.4)	19 (3.7)	16 (3.1)	35 (6.9)
≥70	51 (10.0)	87 (17.0)	138 (27.0)	14 (2.7)	5 (1.0)	19 (3.7)
Total	153 (30.0)	268 (52.5)	421 (82.5)	47 (9.2)	42 (8.2)	89 (17.4)

*X^2 = 5.072, P = 0.079
** X^2 = 8.358, P = 0.004

Table 3. Medical conditions in elderly dental patients in relation to sex.

Diseases/Disorders	Men (n = 200) n (%)	Women (n = 310) n (%)	Total (n = 510) n (%)
Bone/joint disorders *	39 (19.5)	126 (40.6)	165 (32.4)
Hypertension	51 (25.5)	82 (26.5)	133 (26.1)
Allergy	33 (16.5)	60 (19.4)	93 (18.2)
Diabetes mellitus	33 (16.5)	39 (12.7)	74 (14.5)
Eye and ear problems	29 (14.5)	44 (14.2)	73 (14.3)
Cardiovascular disease	22 (11.0)	46 (14.8)	68 (13.3)
Dyslipedemia	19 (9.5)	44 (14.2)	63 (12.4)
Respiratory diseases	19 (9.5)	27 (8.7)	46 (9.0)
Neuromuscular diseases	9 (4.5)	18 (5.8)	27 (5.3)
Gastrointestinal disorders	7 (3.5)	16 (5.2)	23 (4.5)
Cerebrovascular disease	3 (1.5)	14 (4.5)	17 (3.3)
Endocrine disorders (not DM)	3 (1.5)	14 (4.5)	17 (3.3)
Psychogenic disorders	6 (3.0)	8 (2.6)	14 (2.7)
Genital diseases	5 (2.5)	2 (0.6)	7 (1.4)
Renal diseases	4 (2.1)	2 (0.6)	6 (1.2)
Infectious diseases	2 (1.0)	4 (1.3)	6 (1.2)
Blood disorders	2 (1.0)	4 (1.3)	6 (1.2)
Tumors and malignancies	1 (0.5)	3 (1.0)	4 (0.8)
Hepatic diseases	1 (0.5)	2 (0.6)	3 (0.6)
Mineral deficiencies	0 (0.0)	1 (0.3)	1 (0.2)

*X^2 = 24.836, P < 0.001

followed by bone/joint disorders (32.4%), allergies (18.2%), diabetes mellitus (14.5%), eye and ear problems (14.3%), and dyslipidemia (12.4%). Among the cardiovascular diseases, hypertension was the most common disorder (26.1%). Other significant cardiovascular problems included artherosclerotic disease, cardiac hypertrophy, cardiac dysrhythmias, heart valve defects, and myocardial infarction. Bone/joint disorders were found to be significantly more common in women than in men (40.6% vs. 19.5%; P < 0.001). The most common disorders in the bone/joint category were osteoarthritis, followed by rheumatoid arthritis. For allergy, drug reactions were the most

Table 4. Medical conditions in elderly dental patients in relation to age.

Diseases/Disorders	60-64 yrs (n = 163) n (%)	65-69 yrs (n = 190) n (%)	≥70 yrs (n = 157) n (%)
Bone/joint disorders	41 (25.2)	69 (36.3)	55 (35.0)
Hypertension	39 (23.9)	48 (25.3)	46 (29.3)
Allergy	37 (22.7)	33 (17.4)	23 (14.6)
Diabetes mellitus	18 (11.0)	27 (14.2)	29 (18.5)
Eye and ear problems *	19 (11.7)	22 (11.6)	32 (20.4)
Cardiovascular disease	20 (12.3)	22 (11.6)	26 (16.6)
Dyslipedemia	27 (16.6)	22 (11.6)	14 (8.9)
Respiratory diseases	9 (5.5)	20 (10.5)	17 (10.8)
Neuromuscular diseases **	3 (1.8)	11 (5.8)	13 (8.3)
Gastrointestinal disorders	4 (2.5)	11 (5.8)	8 (5.1)
Cerebrovascular disease	7 (4.3)	5 (2.6)	5 (3.2)
Endocrine disorders (not DM)	7 (4.3)	6 (3.2)	4 (2.5)
Psychogenic disorders	4 (2.5)	7 (3.7)	3 (1.9)
Genital diseases	1 (0.6)	3 (1.6)	3 (1.9)
Renal diseases	1 (0.6)	3 (1.6)	2 (1.3)
Infectious diseases	4 (2.5)	0 (0.0)	2 (1.3)
Blood disorders	2 (1.2)	2 (1.1)	2 (1.3)
Tumors and malignancies	0 (0.0)	2 (1.1)	2 (1.3)
Hepatic diseases	0 (0.0)	3 (1.6)	0 (0.0)
Mineral deficiencies	0 (0.0)	0 (0.0)	1 (0.6)

*X^2= 6.811, P = 0.033
**X^2= 6.763, P = 0.034

prevalent. Most of the drug-related reactions were to the penicillin and sulfa groups; other less common drugs inducing allergic reactions were the tetracyclines and streptomycin.

Table 4 shows the distribution of various medical conditions among the three age groups. Bone/joint disorders were more prevalent in the older groups (35% and 36.3%) as compared to the 60-64 year group (25.2%). Eye and ear problems were more common in the oldest group (20.4%) versus the two younger groups (11.6% and 11.7%). These differences indicated the incidence of eye and ear problems increase significantly with age (P = 0.033). The most common eye problems were cataracts, followed by glaucoma. The most common ear problem was impaired hearing resulting from past injuries or ear infections. Neuromuscular diseases were also more prevalent in the oldest group (8.3%) in comparison to the two younger groups (5.8% and 1.8%; P = 0.034). Most of the reported neuromuscular disorders consisted of back and leg stiffness.

Medication Use

Sixty-five percent of this elderly population reported taking medications, with an average of 1.5 drug groups per person. The maximum number of drugs used was four, which occurred in only a small number of elderly subjects (2.1%) 65 years and older. Most of the subjects (41.6%) consumed one drug group. Two groups of drugs were used in 17.8% of the subjects and three groups of drugs were used in 4.7% of the subjects. Women took medications more frequently than men (70% vs. 58.5%; P = 0.008). With reference to age, the use of medications was

Table 5. Medication use in elderly dental patients in relation to sex.

Drug Group	Men (n = 200) n (%)	Women (n = 310) n (%)	Total (n = 510) n (%)
Cardiovascular drugs	55 (27.5)	108 (34.8)	163 (32.0)
Endocrinologic drugs	30 (15.0)	44 (14.2)	74 (14.5)
Nutritional therapeutics*	16 (8.0)	50 (16.1)	66 (12.9)
Drugs acting on musculoskeletal system	16 (8.0)	42 (13.5)	58 (11.4)
Drugs acting on respiratory system	12 (6.0)	17 (5.5)	29 (5.7)
Gastrointestinal drugs	6 (3.0)	16 (5.2)	22 (4.3)
Psychotherapeutic drugs	7 (3.5)	14 (4.5)	21 (4.1)
Eye, ear, nose and throat preparations	3 (1.5)	13 (4.2)	16 (3.1)
Drugs acting on central nervous system	3 (1.5)	12 (3.9)	15 (2.9)
Herbal products	5 (2.5)	10 (3.2)	15 (2.9)
Blood and blood forming agents	6 (3.0)	5 (1.6)	11 (2.2)
Genito-urinary drugs and sex hormones	4 (2.0)	6 (1.9)	10 (2.0)
Anti-infectives	1 (0.5)	3 (1.0)	4 (0.8)
Dental and oral preparations	0 (0.0)	2 (0.6)	2 (0.4)

*X^2= 7.130, P = 0.008

not significantly different among the three age groups. The incidence was 58.9% in the 60-64 year group, 68.4% in the 65-69 year group, and 68.8% in the 70 year and older group. However, the average number of drugs taken increased as age increased (P = 0.041). The number of drugs used was 1.3 drug groups per person in the 60-64 year group, 1.5 drug groups per person in the 65-69 year group, and 1.6 drug groups per person in the 70 year and older group.

Table 5 shows the distribution of various medications used among the elderly in relation to sex. Overall, the four most prevalent drugs were cardiovascular medications (32%), endocrinologic drugs (14.5%), nutritional therapeutics (12.9%), and drugs acting on the musculoskeletal system (11.4%). The other less common pharmacologic agents were those drugs acting on the respiratory system (5.7%), gastrointestinal drugs (4.3%), and psychotherapeutic drugs (4.1%). Among cardiovascular agents, antihypertensives were the most frequent medications, followed by antilipidemia agents. The most common endocrinologic drugs were hypoglycemics and thyroid agents. Nutritional therapeutics included various vitamins, herbal products, and natural supplements. Nutritional therapeutics were used more frequently among women than men (16.1% vs. 8%; P = 0.008). For drugs acting on the musculoskeletal system, the common drugs were analgesics, non-steroidal anti-inflammatory drugs, and muscle relaxants. For drugs acting on the respiratory system, the common drugs were antihistamines and bronchodilators.

Discussion

The incidence of medical conditions in this elderly Thai population is relatively high. Our findings correspond to those of the report from the Ministry of Health in that the three leading problems in elderly Thais were cardiovascular disease, cancer, and diabetes mellitus. Older Thais also suffered from kidney stones, gastric disorders, asthma, and back pain. The finding of an 82.5% incidence of medical conditions in this project is much higher than in our previous study of 4,315 dental records in which an incidence of 36.8% with medical problems was reported in patients 60 years of age and older.9 This discrepancy is because in 1997 our survey was performed on dental patients aged 13 to 91 years, in which patients aged 60 years and older comprised only 7.7% of the sample. The present findings also agree with those of other investigators in that the prevalence of medical problems in the elderly is high. A study in

periodontal patients from three different dental facilities reported an incidence of 55.9%, 74%, and 83% older subjects with medical problems.[7] Peacock and Carson[8] reported 69.5% of subjects who were 60 years and older had medical problems. Umino and Nagao[10] reported one or more systemic diseases were found in 64.2% of elderly Japanese dental patients. The current results are similar to other related reports in that cardiovascular disease is the most common medical problem in older patients; within this group hypertension is the most prevalent cardiovascular disorder.[9,10,12,13] Our results indicated bone/joint disorders affect women twice as often as men. This may in part be related to osteoporosis. Osteoporosis has been reported as a common finding in older individuals especially in postmenopausal women. Irvine[14] stated perhaps the most common rheumatologic disorder among elderly women is the decrease in bone mass known as osteoporosis. This disorder results from age-associated bone loss which begins in youth and progresses at a rate of approximately 0.5-1% per year. The process is accelerated at menopause and may eventually lead to bone fracture. Several studies have demonstrated osteoporosis might contribute to tooth loss and alveolar bone resorption.[25-27] In this study, eye and ear problems show the highest incidence in the oldest group. This supports the idea vision deficit and impaired hearing are associated with more advanced age-related changes. Our results indicated cataracts were the most common vision deficit similar to that reported in elderly Filipinos.[12]

The incidence of medications taken was not different among our three age groups. However, the average number of drugs used increased significantly with age. This supports a trend of more drug use and an increase in systemic diseases in the elderly with advancing age. Reports in the literature suggest 52 to 77% of persons 65 years and older take medications.[16,19,24,29,30] Our results indicated the use of drugs in subjects aged 65 years and older is 68.3%. A previous Thai study reported 56.7% of dental patients took medications.[30] Our higher incidence (65.5%) may be explained by the fact the other Thai study was not focused on drug use in older subjects. With respect to age, surveys have usually shown a greater prevalence of drug use in the elderly as compared to younger individuals.[15,16] The pattern of drug use in our study is similar to other reports,[19,21] that is to say cardiovascular agents are the most common group of medications taken by the elderly followed by hypoglycemics and thyroid preparations. In our study, the common drugs used among our elderly population are also reported to be of dental significance. Other authors have found the elderly often take medications with a potential impact on oral health.[23, 31] We found women use drugs more often than men as was seen in other reports.[1,19] Our study population included more women than men and corresponds to our dental school patient pool in which the female to male new patient ratios in the years 2001 and 2002 were 1.6:1 and 1.7:1, respectively. This is not surprising since women have been reported to be more concerned about their health and seek treatment more than men.[32,33]

The present study supports the findings of previous reports in that the presence of medical conditions is high in the elderly and the incidence of medication use increases with advancing age. Thorough medical history taking is especially important in this age group and should include a health questionnaire, an interview, and copies of treatment records from the physicians and careful analysis of all the drugs being taken. Dentists need to be aware of medical problems that may require dental management modifications. If there are any doubts concerning the patients' physical status, further consultation with the physician is highly recommended. Medical consultation is especially indicated for patients who provide conflicting or vague medical histories or report symptoms that may be manifestations of the systemic disease under treatment or its management. One study showed medical consultations could reduce the medical risk associated with dental procedures and unnecessary

antibiotic prophylaxis.[34] After the patient's conditions are clearly identified, and the risk assessed including possible further medical stabilization, the most appropriate treatment can be initiated. For patients whose medical status places them at significant risk, dental therapy must be kept at a minimum and may be limited to palliative or emergency care to alleviate discomfort.

Conclusion

Dentists must be knowledgeable as to the nature and side effects of medications taken by their patients and of the need to modify treatment or patient management where appropriate. For example, patients with hypertension may be treated with a diuretic that may cause xerostomia. This may lead to an increase in the caries incidence and the pattern of caries such as recurrent caries at the margins of restorations or crowns, candidiasis, poor retention and discomfort associated with prostheses especially complete dentures, an alteration in the diet to more cariogenic food groups, and altered taste complaints. These complications are further increased when the hypertension requires management with several medications. Such cases may be considered for

substitute drug management without the xerostomic side effect. If this is not possible, then the dentist needs to be ready to initiate dental treatment and prevention procedures directed at the management of the side effects such as a comprehensive caries prevention plan, early recognition and treatment of candidiasis, and procedures to enhance prosthesis retention and comfort such as soft relines. Information on prescription drugs may be searched online at https://www.pdr.net or in the printed version of the Physicians' Desk Reference®.

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