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Oral health in Florida nursing homes

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© 2006 The Authors. Journal compilation © 2006 Blackwell Munksgaard Abstract: Objectives: The purpose of this study was to measure the oral health and hygiene status among 265 South Florida nursing home residents aged between 45 and 98 years. Methods: The oral health and hygiene status of the residents were assessed by noting the presence of calculus, caries, gingivitis, cheilitis, apthous ulcer, dry mouth and red or white lesions. Results: The incidence of nursing home residents with calculus was 79.6% and the remaining 20.4% were edentulous. More than half of residents had oral problems (50.6%) the commonest was gingivitis (36.6%), followed by caries (26%) and tooth fracture (15.9%). Almost half the residents wore dentures (47.2%). Statistical analysis was conducted using analysis of variance (P-values). Ageing of the residents was statistically correlated to a worsening of oral hygiene status (P < 0.0066), absence and presence of one or two dentures (P < 0.0034) and a loss of teeth (P < 0.0001). Conclusions: The ageing of residents is correlated to increasing oral health problems and the loss of teeth. Oral health neglect affects almost all of the nursing home residents. Care providers should receive education and training from dental hygienists to improve the standard of oral hygiene and health of the elderly.

Key words: calculus; caries; dentures; elderly; geingivitis

Introduction

Many nursing home residents lack the physical or mental capacity to maintain a good standard of oral hygiene by themselves. The residents of nursing homes are vulnerable to oral health neglect because they are functionally dependent, medically compromised, and/or cognitively impaired. Therefore, a continual monitoring of the oral health standards within nursing homes is required to ensure that elderly residents receive routine oral health care, and that oral health problems receive treatment. Previous reports indicate that the poor oral health status of elderly nursing home residents is scandalous. In one study of elderly nursing home residents by Frenkel et al. (1), over 70% had not seen a dentist for over 5 years, and 22% reported an untreated dental problem. Calculus was present in 82% of subjects and 95% of the dentures worn by subjects were unhygienic. The incidence of untreated root caries is reported in the range of 64% (2) to 22% (3) of nursing home residents. Dry mouth is found in 10% of nursing home residents (4) and 28.6% wear removable partial dentures (5). Among elderly Americans aged 65-74 years, a 25% incidence of severe periodontitis was observed (6). Severe periodontitis is defined as loss of attachment >6 mm (6). The general oral health and hygiene status of these homebound elderly was found to be poor, with 84% of the subjects requiring dental care (7). These reports indicate that a high proportion of elderly nursing home residents suffer from a range of serious oral health problems.

American's oral health status improved dramatically over the past five decades. Older Americans are more likely to be dentate than ever before, with only 29% of 65-74 year olds completely edentulous in 1988-94 compared with 46% in 1971-74 (6). Yet there remains room for improvement. The government Healthy People 2010 Objective 21.4 is to reduce the number of 65-74 year olds who have lost all their teeth to 20% from a baseline of 26% (8). The living environment and general health of people can create large variations in oral health and hygiene status. Medically healthy elderly persons generally have a much better standard of dentition compared with the sickest persons living in a nursing home, who are more likely to experience oral health problems, and be edentulous or have many missing teeth (9). Up to 42% of nursing home residents have been reported as being edentulous (10) double the average for all the elderly in total. There is a particular need to monitor the oral health status of elderly Americans living in nursing homes, because this subpopulation appears to be among the most vulnerable to poor standards of oral health care.

Approximately 1.6 million Americans live in Nursing homes (11). In the USA, population projections suggest that the proportion of the population aged 65 years or older will nearly double between 2000 (12.6%) and 2030 (20.0%) and that the proportion of the population of those aged 85 years and older will increase substantially over the next 10–15 years (12). People over 65 years of age make up about 12% of the USA population, but they consume 30% of all prescription medications, many of which can have a negative impact on oral health (13). The elderly have a high utilization for dental services (14).

These trends suggest that the numbers of elderly will increase, and demand for geriatric dental care will grow substantially. The purpose of this study was to investigate the type and incidence of oral health problems within 265 residents of four nursing homes in south Florida. An assessment of the oral health and hygiene status of nursing home residents is necessary to determine the severity of the problem of oral health neglect in south Florida nursing homes.

Materials and methods

Informed consent for completion of a non-invasive oral examination was obtained from the residents of four nursing homes located in the South Florida area. The four nursing homes are representative of socioeconomic diversity: three are entirely Medicaid-Medicare funded and the fourth one is a private home, where residents must pay for their care. Information gathered from resident records included the age of the resident. The presence of oral health conditions was assessed using the criteria summarized in Table 1. The criteria is based on a modified World Health Organization Oral Health Assessment Form using DMF and ESI indices (15), the prevalence of oral lesions, levels of tooth loss, oral hygiene scores and the status of existing dentures (16). Probing of periodontal pockets was not performed, and radiography was not performed. Recorded were the oral hygiene status, numbers of remaining natural teeth, prosthetics, caries, gingivitis, tooth fracture and xerostomia (dry mouth) assessed by a reduced flow of saliva and the reporting of associated symptoms; trouble chewing, swallowing, tasting or speaking, and the presence of soft-tissue lesions. Each resident underwent an intraoral examination performed by an experienced associate professor (DEN), who used a mouth mirror and light at the bedside of the patient. Data were analysed statistically using analysis of variance (ANOva) tests at a significance of 95%.

Results

The mean age of the 265 nursing home residents in this study was 77.3 years of age. The youngest resident was 45 years and the oldest was 98 years of age. Few residents were aged below 60 years or above 90 years of age. A histogram of the age distribution of nursing home residents is shown in Fig. 1.

The dentition, oral hygiene scores, oral status, soft-tissue lesion type or dry mouth and the status of dentures of elderly nursing home residents are given in Table 2.

The amount of calculus covering teeth and the general oral hygiene scores of the residents appears to worsen as the mean

Table 1. Chiefia for the presence of oral health conditio	Table	1.	Criteria	for th	ie prese	nce of	oral	health	condition
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Criteria	Assessment
Dentition	The number of visible tooth crowns
Oral hygiene	The presence of calculus measured according to the average coverage of the tooth crowns
Oral status	The presence of gingivitis, caries, and tooth fracture was assessed on any tooth
Gingivitis	Inflamed red margins, swelling and bleeding
Caries	Decay discoloration from a white spot to an advanced cavitation lesion present in any crown area
Tooth fracture	Fractured crowns or root tips are observed
Lesions	Candidiasis, apthous ulcer, cheilitis, fistula, abscess, red or white lesion, dry mouth
Mixture of lesions	More than one type of lesion is present
Candidiasis	Creamy white to yellow elevated plaque
Apthous ulcer	Localized swelling of the affected oral mucosa to form a small round or oval shaped blister
Cheilitis	Cracking or blistering of the oral mucosa or lips
Fistula	Abnormal tract within the oral tissue
Red lesion	Red coloured lesion
White lesion	White coloured lesion
Xerostomia	The mouth has minimal saliva
Prosthesis	Presence of partial denture in mouth or room
Wears denture	The patient routinely wears the denture
Endentulous without denture	The patient has no teeth and does not have any denture



Fig 1. Histogram of the age distribution of nursing home residents.

age of the resident increases (ANOVA, F = 4.173, P < 0.0066). The absence of calculus on any teeth was observed in 20.4% of residents, 53.6% of residents had calculus covering up to 1/3 of the clinical crowns of teeth, 22.3% of residents had calculus covering up to 2/3 of the clinical crowns of teeth, and 3.7% of residents had calculus covering more than 2/3 of the clinical crowns of teeth. The oral hygiene status of the residents is shown in Fig. 2.

The mean number of teeth per resident is correlated to age (ANOVA, F = 7.01, P < 0.0001). The mean age of edentulous nursing home residents is 81.4 years, while the residents with higher numbers of teeth are generally younger. The number of teeth and mean ages of the nursing home residents is shown in Fig. 3.

The age of the resident is correlated to the number of dentures worn (ANOVA, F = 5.798, P < 0.0034). Younger residents are more likely not to have any dentures, the use of upper or lower dentures increased with the age of the resident, the mean age of residents wearing one denture was 77.4 years, and the mean age of residents having two dentures was 79.9 years of age.

The prevalence of soft-tissue lesions and dry mouth was observed in 6% of residents. Xerostomia was diagnosed in 3.4% of residents and various types of lesions were identified of lesions in 2.64% of residents. The presence and type of lesion or xerostomia is not directly correlated to the age of residents (ANOVA, F = 1.294, P < 0.253). The type of lesions or xerostomia and the age of residents are shown in Fig. 4.

Discussion

The present study provides some powerful evidence to suggest that a high proportion of elderly nursing home residents suffer from oral hygiene and oral health neglect. There is a real need for expanded epidemiological studies involving thousands of nursing home residents to examine oral hygiene status and the incidence of untreated oral diseases. Ideally, the scope of new investigations should include disease risk factors; the training of care providers, and the impact of the ageing population on the dental delivery system. Past attempts to conduct these types of studies have been limited by the government's preoccupation with cost containment (17). Sometimes, the investigations of nursing home residents have only investigated one location, and the sample size has been approximately 50 residents (7, 18). The present investigation is inherently more representative of the status of elderly nursing home residents, because the oral health status of 265 residents in four nursing

Table 2. The levels of tooth loss, oral hygiene scores, oral status and the status of existing dentures

Variable	Residents (total = 265)	Percentage
Dentition		
Edentulous	54	20.4
Patients with teeth	211	79.6
1–5 Teeth	11	4.2
5–10 Teeth	25	9.4
11–20 Teeth	55	20.8
>20 Teeth	120	45.3
Oral hygiene scores		
Excellent – very clean	54	20.4
Not good, some calculus present	211	79.6
Calculus up to 1/3 clinical crown	142	53.6
Calculus up to 2/3 clinical crown	59	22.3
Calculus over 2/3 clinical crown	10	37
Oral status	10	0.1
No oral status problems	131	49 4
Patients with at least one	13/	
oral status problem	104	50.0
Gindivitie	97	36.6
Carios	57 60	26.0
Tooth fracture	42	20.0
	42	15.9
Nene	225	94.0
Norie Mixture of logicase	223	04.9
	1	2.0
Chemilis	I E	0.4
	Э 1	1.9
		0.4
Aptrious ulcer	2	0.8
Dry mouth	050	00.0
None	256	96.6
Xerostomia	9	3.4
Status of dentures		50.0
No denture	140	52.8
Wears denture	125	47.2
Wears both upper and lower denture	11	21.9
Upper denture	111	41.9
Partial denture	40	15.1
Complete denture	71	26.8
Wears upper denture	100	37.7
Lower denture	88	33.2
Partial denture	41	15.5
Complete denture	47	17.7
Wears lower denture	72	27.2
Edentulous and without dentures	12	4.5

homes located in South Florida was evaluated. We could not find any difference in the standards of care provided between the four nursing homes, suggesting that the findings are representative for the area. There is a long-term need to periodically inspect the oral health and hygiene status of nursing home residents, and also other people who reside in long-term care facilities across the USA inspections appear to be necessary to ensure that nursing home residents are receiving assistance from care providers to maintain a good standard of oral hygiene, which will benefit the residents by helping to avoid the onset of oral diseases and conditions.







Fig 3. Numbers of natural teeth per resident.



Fig 4. The prevalence of soft-tissue lesions and dry mouth.

Candidiasis is a common problem among older, chronically ill, institutionalized adults. Oral candidosis, formerly known as oral thrush, is usually caused by the yeast fungus *Candida* *albicans* (19). It affects the mucous membranes of the oral cavity, mainly the surface of the tongue, palate, cheeks and lips, and is the same organism that causes vaginal yeast infections. *Candida* hyphae have been detected in approximately 80% of tissue and or dentures (20). The microwaving of some dentures may be one of the most effective methods to remove *Candida* hyphae and other infections (21). The implementation of oral care as part of a preventive programme can quickly be effective in reducing the colonization of the oral mucosa and dentures by *Candida* and thereby improving the health of the oral mucosa (22). Nursing home residents are prone to fungal infections spread by cross-contamination (23). Care providers need to take preventive measures to safeguard the oral health of residents against all fungal infections.

The numbers of edentulous nursing home residents was 20.4%, this is half the incidence reported recently by Peltola et al. (10). The lower than anticipated numbers of edentulous nursing home residents appears to follow the general trend reported across the USA (6). However, it should be noted that the oral health status of nursing home residents can deteriorate within a short time. In the present study, most residents aged 75 years and younger had 21-32 teeth, while those aged 81 years and older were on average; edentulous. The dramatic change in oral health status over 6 years, highlights the need to ensure that a daily oral health care routine is provided by the care providers in nursing homes. The elderly can give their care providers many complex and challenging behavioural problems during the provision of oral hygiene care. A symptom of the challenge of care provision may be the 4.5% (n = 12) of edentulous residents who do not wear dentures. It is not clear how many residents refuse to participate in their oral healthcare provision, and this issue is a matter that should be studied in future investigations. However, the high proportion of residents with calculus (79.6%), suggests that the problem of inadequate routine oral health care is caused by the lack of attention provided by the care staff. The oral neglect may be created because of a lack of training, and/or a lack of time available. A study by Frenke1 et al. (1) of dentate elderly subjects found that 75% were unable to clean their teeth, yet none received regular assistance. This suggests that oral hygiene neglect is a key factor in the worsening oral health status of elderly nursing home residents. We did not examine care-staff neglect, but a previous investigation of functional dependency found that it increased dramatically with age. The rate of functional dependency increases dramatically with age, from about 10% at age 65-69 to about 57% after age 85 (24). In one Japanese study (25), it was reported that only 54% of carestaff had been trained in oral cleaning for dependent elderly. Eleven per cent of the elderly population in one survey had 70% of coronal decay (26), suggesting the presence of elderly subgroups, more in need of special oral care compared with others. The key to providing good quality routine oral health care is to train the daily care providers to clean teeth and dentures. Care providers must also be trained to identify caries, diseases and lesions. Dental hygienists are ideally suited to educate and train nursing home and hospital care providers (27).

The amount of calculus covering teeth and the general oral hygiene scores of the residents appears to improve as the mean age of the resident increases. The reason for this correlation is not known, but it may occur because more elderly residents generally receive more frequent care and attention compared with younger residents. Moreover, the increasing edentulous trend among the elderly indicates that the older patients are more likely to have fewer teeth; the lack of teeth will simply avoid calculus buildup. The generally poor standard of oral hygiene is evidenced by the 79.6% of patients observed to have calculus covering tooth surfaces. This is likely related to the 50.6% of residents with oral health status problems. Among these residents, 36.6% had gingivitis, 26%% had caries, and 15.9% had tooth fracture. The 79.6% incidence of calculus in nursing home residents is similar to that reported in England (1), Scotland (28), Finland (29), Germany (30) and Japan (31). This suggests that the oral health status and incidence of oral health problems is similar across the developed nations. Many of these nations have a national health service, indicating that expenditure on nursing home care does not appear to have much effect on the standard of oral health care at a supranational level. However, the lack of expenditure on oral health care may be expected to be part of the problem for poor oral health status in the USA. In 1993, adults over the age of 65 years had the lowest proportion of dental expenses reimbursed by private dental insurance (10%), and the highest percentage of out-of-pocket dental expenses (79%), when compared with all other age groups (32). A 2004 study indicated that little has changed over the past 11 years and edentulous and poorer adults are less likely to have insurance coverage and report dental visits (33). Of the two largest public programs, Medicare does not pay for most dental services, and Medicaid (Title XIX), does not offer dental benefits for adults in most states.

Good oral health is related to wellbeing status (34) and the avoidance of pneumonia (35). If untreated, oral health disorders may cause pain, result in tooth loss, produce unpleasant tastes and halitosis (36) and impinge on nutritional intake (37). Measures to improve the oral health care of residents will also provide other benefits, related to the quality of life, nutritional intake, avoidance of illness and improved psychological state. The numbers of elderly residents of nursing homes will increase dramatically in the future, and unless steps are taken to improve the standards of oral hygiene and health, more millions of elderly are likely to suffer from oral health problems.

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