FEATURE ARTICLE

ORAL HYGIENE AND INSTITUTIONALIZED ELDERS

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KEYWORDS: long-term care, elderly, oral hygiene, oral health education programs

ABSTRACT

The oral hygiene of institutionalized elders is poor. This population exhibits an increased risk of oral infections such as periodontal disease, caries, inflammatory mucosal disorders, and denture-related problems. Poor oral health has been associated with systemic infections, such as respiratory infections, and nutritional inadequacies. Thus the maintenance of oral health among institutionalized elders is of significant value as it has an impact on general health and quality of life. Considerable literature, however, indicates that institutionalized elders have limited access to professional oral health care services. As well, the primary caregivers, the care aides, face many barriers to providing daily oral hygiene, barriers such as time constraints and limited training in oral hygiene practices.

Oral hygiene in-service training programs provided by a dental hygienist can raise the profile of oral health within the institution, support the integration of oral health care into the overall care of residents, and provide caregivers with an opportunity to be educated about daily mouth care. Dental hygienists have the education and skills that enable them to identify the oral care needs of the residents and to act as consultants for oral health policy, procedure, and program development within institutions.

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INTRODUCTION

The Canadian population is aging. People are not only living longer but older adults are making up an increasing percentage of the population. In 1961, individuals aged 65 and older comprised 7 per cent of the Canadian population, but by 1999 this figure had risen to 11.6 per cent or 3.2 million people.[1] By the year 2021, individuals aged 65 and older will comprise approximately 16 per cent of the total population. It is also expected that the proportion of individuals 85 years of age and older will rise at least threefold during the same period.[1]

The increasing senior population will create a number of challenges for society and for dental and medical professionals. Elderly individuals, with a combination of normal physiologic aging, higher incidences of chronic disease, and multiple effects of medications, are complex patients.[2] Many of the systemic illnesses experienced by the elderly may be affected by oral disease.[3,4]

Edentulism rates are expected to decrease due to the use of fluorides, better dental care, and heightened dental awareness.[5,6] As a result, dental professionals will be seeing more elders with an increased need for a full range of dental services.[7] In an attempt to provide the most complete care for these patients, the dentist and dental hygienist should be aware of not only the patient's dental needs and how they can be met, but also how the patient's general medical health may affect the provision of this care.[2]

Approximately 10 per cent of Canadians aged 65 and over are residents of long-term care institutions.[8] Long-term care (LTC) provides a range of services that addresses the health, personal care, and social needs of individuals who lack some degree of self-care ability.[9] The majority of institutionalized elders are dependent on caregivers to help manage their daily oral hygiene.[2,10] However, daily oral hygiene, essential for maintaining oral health, is severely compromised in the institutionalized setting.[11] One reason for this may be that nurses, faced with the many conflicting priorities in LTC, feel uncertain about prioritizing the demands of oral hygiene.[12] Furthermore, residents feel frustrated by this neglect,[13] and care aides would benefit from education on oral hygiene.[14]

SOMMAIRE

Chez les aînés qui sont dans les institutions, l'hygiène buccale est de piètre qualité. Cette population montre un plus grand risque d'infections buccales comme les maladies parodontales, les caries, les désordres inflammatoires des muqueuses et les problèmes liés à la dentition. La mauvaise santé buccale a été associée aux infections systémiques, comme les infections respiratoires et les carences nutritionnelles. Ainsi, le maintien de la santé buccale chez les aînés en institutions est très important à cause de l'impact qu'il a sur la santé générale et sur la qualité de vie. Une importante littérature indique toutefois que les aînés en institutions ont un accès limité aux services professionnels de soins de santé buccale. Les dispensateurs de soins de première ligne, les aides de soins, font également face à de nombreux obstacles pour dispenser une hygiène buccale quotidienne, comme les contraintes de temps et un manque de formation dans les pratiques d'hygiène buccale.

Les programmes de formation en hygiène dentaire offerts sur le terrain par l'hygiéniste dentaire peuvent relever le profil de la santé buccale dans l'institution, soutenir l'intégration des soins de santé buccale à l'ensemble des soins des résidents, et offrir aux dispensateurs de soins l'occasion de recevoir un enseignement sur les soins quotidiens de la bouche. Les hygiénistes dentaires possèdent les connaissances et les compétences qui leur permettent d'identifier les besoins des résidents en matière de santé buccale et d'agir comme conseillères pour le développement de politiques, de procédures et de programmes de santé buccale dans les institutions.

Many institutionalized elders have oral diseases and conditions, much of which goes untreated.[15,16] Treating these patients is an ongoing challenge; clinicians may be faced with potential barriers to providing care such as serious medical concerns, physical disabilities, mental challenges, and socioeconomic issues.[17-19]

This paper reviews the literature on oral hygiene in the institutionalized setting. A review of Medline for the years 1964–2000, with particular emphasis on literature published in the last decade, was used. The interrelationships between oral health, general health, and nutrition will be explored. As well, recommendations will be made concerning daily oral hygiene in the residential care setting, with special focus on oral care programs, and the role of dental hygienists in this setting.

ORAL HEALTH AND GENERAL HEALTH

The association between poor oral health and poor general health is not always made. The elderly make up a population at considerable risk for oral infections such as periodontal disease and caries.[5,7,20] The higher incidence and greater severity of oral infection among institutionalized elders results from greatly elevated levels of pathogenic microorganisms in the oral cavity and oropharyngeal fluids.[21] Unchecked oral diseases in an older person can have systemic implications.[17] Institutionalized elders experience a high rate of systemic infection, respiratory infection being the most common.[22-25] This is compounded by an age-associated decline in resistance to infection that makes the elderly more vulnerable to respiratory illnesses.[21,26] Institutionalized elders who exhibit poor oral hygiene may have a greater risk of oral colonization of potential respiratory pathogens that may be aspirated into the lower respiratory tract where they can multiply and cause infection.[27,28] Improving oral hygiene among institutionalized elders may decrease orophyaryngeal colonization by microorganisms that may be aspirated, thereby reducing the risk of respiratory infections.[27]

ORAL HEALTH AND NUTRITION

Poor oral health places an individual at higher risk for nutritional deficiency.[29-31] Frail elders with poor teeth take little pleasure in eating a diet that consists primarily soft, puréed, or mashed foods.[32] This can result in self-imposed restrictions in food selection that can in turn contribute to a low intake of essential nutrients. This leads to a state of under-nutrition.[31,33] A wide range of potential under-nutrition of nursing home residents has been reported.[31,34] Poor nutrition is a factor in xerostomia and age-associated physiological changes that affect digestion, absorption, and taste perception.[34] This has a negative impact on food selection and appetite.[35] Xerostomia, which affects about 20 per cent of elders, has a negative effect on appetite and oral comfort.[36] Xerostomia affects the ability to chew and form a food bolus. This leads to avoidance of certain foods, resulting in nutritional inadequacies.[35,37]

Age-associated gastrointestinal changes affect the digestion, absorption, and metabolism of food.[38,39] Age-associated changes in olfaction and taste can influence food selection among the elderly. Atrophy of olfactory bulb receptors decreases an individual's ability to smell,[39] resulting in a decline in taste perception.[40] As a result, elders have a diminished appetite, food becomes less appealing, and there is potential for under-nutrition.[39]

There is some evidence that masticatory efficiency is associated with nutritional status.[41] Dentate individuals have significantly better chewing efficiency than denture wearers.[42-44] With a decreased chewing ability, most edentulous people prefer to consume more soft processed foods rich in carbohydrates and saturated fats.[6,45-47] Most of these soft, easy-to-chew foods contain a lower nutrient density, placing the individual at risk for nutritional inadequacies[48] and dental caries.[5]

Improving oral hygiene and maintaining dentition should positively affect an elderly individual's ability to chew a wide variety of foods. This may lead to a greater intake of essential nutrients and improvement in nutritional status and in turn positively affect overall health.

PERIODONTAL DISEASE AND CARIES

Aging itself does not cause periodontitis.[49-52] Rather, decreased physiological capacity due to aging affects an elderly individual's ability to deal with this infection.[53-55]

There is no evidence that susceptibility to periodontal destruction increases with age, especially when good oral hygiene is maintained.[55,56] However, minimal access to dental care, compounded by poor oral hygiene practices, places the institutionalized elderly at high risk for the development of periodontal disease.[53,55]

Dental caries are also a substantial problem for the institutionalized elderly since consumption of refined carbohydrates, particularly sucrose, is commonplace in LTC facilities.[5,9,57] A comparison of dietary habits, nutritional status, and oral health was made between 753 elderly who were living independently and 202 institutionalized elderly aged 65 or older. The frequency of sugar intake was much higher in the institutionalized group, a mean of 7.9 intakes daily versus 5.1.[58] Caries is the major cause of tooth loss in all age groups.[5] However, caries in the elderly usually occur on root surfaces due to gingival recession exposing root surface area, medications with xerostomic side effects, and poor oral hygiene.[11,59,60] Longitudinal studies have revealed that coronal and root caries infect, on average, over half of the institutionalized elders and close to one-third of the independent dentate elders.[56]

Prevention of dental caries among institutionalized elders is far more cost-effective than the provision of dental treatment.[5] Preventive strategies to help reduce the incidence of caries, and possible subsequent tooth loss, should include dietary control of refined carbohydrates, improved oral hygiene practices, and regular applications of remineralizing and antimicrobial agents.[5] Fluoride is the only chemical agent available that is capable of remineralizing teeth and creating surface resistance to demineralization.[61,62] Fluoride is available in various formulations and can be applied as a rinse, gel, or varnish.[63,64] Concentrated fluoride varnish applied every three to six months to exposed root surfaces decreases the development of root caries significantly.[65,66] Chlorhexidine, an antimicrobial agent, has also been shown to inhibit the incidence of caries when applied as a varnish to exposed root surfaces.[64,67] A 1% chlorhexidine gel administered over a 12-day period for 10 treatments (2–4 ml of gel applied in custom trays for five minutes) has been shown to reduce the incidence of caries in institutionalized elders.[68] Combinations of chlorhexidine and fluoride may be even more effective in reducing the incidence of caries.[69]

ORAL HYGIENE

Professional programs

The literature points to a need among the institutionalized elderly for greater access to oral health care services.[60,70] Reports have demonstrated that up to 80 per cent of functionally dependent elderly have immediate dental treatment needs,[10,71] with at least half of the subjects with natural teeth exhibiting caries.[8] Numerous studies have shown perceived dental needs among institutionalized elderly to be lower than actual clinical need.[10,72-74] However, the dental treatment available within LTC facilities is limited usually to emergency care.[12,75,76] Hospital-based dental clinics and mobile dental services allow dentists and dental hygienists to provide oral health care to the institutionalized elderly.[10,11] Assessment upon admission to the facility identifies oral health care needs. Following identification of these needs, continuing dental care should be available for long-term care residents.

Daily oral hygiene by care aides

It is generally the care aides who are responsible for providing daily oral hygiene for the residents.[72,77] However, care aides receive minimal if any education concerning oral hygiene.[14] They also face many barriers to providing daily oral hygiene for residents including combative or non-compliant residents, time limitations, and lack of knowledge concerning oral hygiene techniques.[9,11,17,73,74,76] Furthermore, a lack of perceived need for oral care and care aide attitudes towards oral care also significantly affect the provision of daily oral hygiene in the institutionalized setting.

In general, care aides believe that proper training could improve the quality of oral hygiene care that they provide for residents.[14] Oral hygiene education programs can increase the knowledge among nursing and care aide staff, provide an understanding of daily mouth care, and help to improve the oral health of residents. To create a program that is appropriate to the needs of care staff, their role, attitudes, actions, and experiences must be understood.[14]

The most effective way of educating LTC staff is through in-service education programs that incorporate demonstrations, lectures, audiovisual aids, handouts, and group discussions.[73,78] In-service education programs provided by a dental hygienist can raise the profile of oral health, support the integration of oral health care into overall care, and explain oral

care procedures to a variety of caregivers.[73] Prior to and following in-service presentations, questionnaires should be distributed to the participants so they have the opportunity to comment on the usefulness of the information presented, presentation skills, and future topics of interest. This feedback can be used to assess the knowledge levels of participants, their attitudes towards oral care, and the retention of information following in-service presentations.

Oral health education programs must be structured differently for personnel with different levels of health care education. A study by Paulsson et al.[79] found that nurses, who were considered a "high level healthcare education" group, favoured theoretical aspects of an oral hygiene education program. Nursing assistants and care aides, who comprised a "low level healthcare education" group, favoured practical procedures. Thus it would seem beneficial to present theoretical information (such as disease information and prevention of diseases) to the nurses, and to present the more practical portion of the program (such as tooth brushing techniques) to the care aides who are more involved in the daily oral hygiene of the resident.

Many studies have concluded that educational programs alone, directed toward nursing and care aide staff, have not been effective.[12,14,80,81] Kay and Locker[82] concluded that dental health education intervention programs that focused on improving LTC staff's knowledge of and attitude toward the importance of daily oral care, resulted in consistently raised knowledge levels, but that the effect on attitudes tended to be short-lived. These conflicting results call attention to the need for further studies that can provide information about the value of oral hygiene programs.

Oral care aid products

Impaired manual dexterity, due to arthritis or stroke, makes it difficult for some LTC residents to manage their own daily oral hygiene, particularly using a manual toothbrush.[7] Persons with functional disabilities have poorer oral hygiene plus higher rates and severity of periodontal disease and caries than healthier peers.[83,84] Oral care practices may need to be adapted to the individual's needs after careful consideration of skill level and functional status. The elderly individual's physical range of motion, grip strength, ability to understand and follow directions, and current self-care techniques should be addressed.[39] For the institutionalized elderly, tooth brushing is preferred for the removal of plaque and debris from teeth and dentures as flossing may be complicated by issues of dexterity of the care provider or the resident.

Depending on the level of assistance required by a resident, the dental professional (or care provider) can make simple adaptations to oral hygiene aids such as enlarging the handle of a toothbrush to make it easier for arthritic patients to grasp.[39] This can be done by simply wrapping a face cloth around the handle and securing it with an elastic band. Also, several manufacturers, such as Butler, Oral-B, Pycopay, and Sensodyne, market toothbrushes that can be bent by hand to allow better angulation and access into the client's mouth.[39]

Many older adults with poor dexterity and coordination could also benefit from using a power toothbrush, a device that can also be easily manipulated by a caregiver. A study comparing the efficacy of a power toothbrush with that of a manual toothbrush among functionally dependent institutionalized elderly showed a 38 per cent plaque reduction with the power toothbrush compared with a 6 per cent reduction using the manual brush.[85] Witmyer et al.[86] also found significant reductions in plaque score and bleeding index with the use of the ultrasonic power toothbrush.

A ROLE FOR DENTAL HYGIENISTS

Dental hygienists play a key role in promoting oral health among the institutionalized elderly. The education and skills of dental hygienists enable them to act as consultants for procedure and program development, identify oral care needs of residents, develop individualized care plans, provide clinical hygiene treatment, make referrals to dentists, and implement facility oral health programs.[10,60,87]

Oral hygiene programs for long-term care facilities

When developing an oral hygiene program for a LTC facility, the following must be considered:

- The program should be modeled differently for facility staff with high or low levels of oral health care education.
- Information on oral diseases and pathology, prevention of diseases, etc. should be directed primarily toward the nurses, who could transmit relevant information to care aides.
- Information on delivery of daily oral hygiene should be directed to both nurses and care aides, but the focus for this information should be on the care aides since they are primarily responsible for this task. For example, a video could help demonstrate the proper techniques for cleaning dentures, brushing and flossing teeth of functionally dependent residents, independent, uncooperative, aggressive and resistive, and unconscious residents.
- An informational manual should also be provided and should include: accompanying text for the visual information presented in the video, information on plaque (as it relates to the development of gingivitis, periodontal disease, and caries), xerostomia and increased risk of caries with dry mouth, management strategies for xerostomia, infection control, importance of denture labeling, role of diet (particularly in relation to the development of caries), diagrams or photographs for correct positioning of caregiver and resident during treatment, relevant intraoral and extraoral photographs, evaluation and comment section, a short quiz to facilitate retention of information and re-emphasize key points.
- Hands-on demonstrations with residents and role-playing would also be beneficial.

Nurses are an important component of a successful oral hygiene program. Nurses are best suited to regulate and enforce oral hygiene delivery by care aides. Communication should remain open between nurses and care aides to address

and resolve any oral hygiene issues. Care aides should feel comfortable expressing their opinions and potential barriers to providing care must be addressed.

A dental professional, such as a dental hygienist, may be the most qualified individual to deliver the in-service presentations and supervise the demonstrations and hands-on training with residents. Dental hygienists can also participate in care conferences where specific oral health concerns for each resident could be addressed and recommendations for improvements suggested. The hygienist should deliver in-service training on a regular basis to help ensure that appropriate standards of oral hygiene care are being met and to address concerns from staff and the residents themselves.

The success of an oral hygiene program requires an effective instructional program for facility staff, a staff commitment, and cooperation among all staff involved. Administrative support is essential in terms of prioritizing, funding, and implementation of the oral hygiene program itself. Funding should cover supplies such as toothbrushes, fluoridated toothpaste, alcohol-free mouthwash, aids for xerostomic conditions, denture containers and brushes, denture cleaners and labeling kits.

CONCLUSION

The elderly represent an increasing segment of the Canadian population. There is a rapidly expanding number of elders who take up residence in LTC facilities, many of them having poor oral hygiene. Plaque-related problems, particularly caries, are prevalent among this vulnerable segment of the population. Yet despite a widespread need for oral health care services, there exists a void in delivering treatment beyond the traditional confines of dental practice. Focus should therefore be placed on preventive strategies for oral hygiene care. The development and implementation of oral hygiene programs in LTC facilities can increase the knowledge and awareness among caregivers, residents, and their families of the importance of daily mouth care and subsequently help to improve the oral health status of the residents. In so doing, this would help reduce the incidence of oral infection that may lead to systemic infection and poor nutritional status. Improving oral hygiene among this age group would improve the general health and wellness of the individual, improve their quality of life, self-esteem, and relationships with others.

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