Oral Healthcare and the Frail Elder
A Clinical Perspective
Theories and significance of oral health in frailty

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WE ARE ALL AGING

Clinicians are becoming increasingly interested in the complexity of the mouth in old age as more people are living longer with natural teeth, and there is an appreciation that the mouth and teeth if neglected, can be a serious source of distress and disease. In this chapter, we address the demographics of our changing populations, we highlight how age impacts the mouth and what we think it means to be frail, and finally, we explain how frailty can contribute to and be aggravated by oral diseases, impairments, and disabilities.

The world population is aging as a consequence of longer life expectancy and a decline in fertility, particularly in developed countries, during the latter half of the past century (Fitzpatrick, 2003; United Nations Department of Economic and Social Affairs, 2010). While people in Europe, North America, and Japan are living longer than ever before, a dramatic increase is expected by 2050 in the proportion and total numbers of older people in Latin America, China, and India (Gutman et al., 2000). The current demographic change is a global phenomenon. In 1950, for example, there were about 131 million people on Earth who were 65 years of age or older, whereas by 1995 the number had tripled to about 371 million. Moreover, if the current growth continues until 2025, the number is likely to double, and by 2050 there will be more than 1.4 billion elders around the globe (Fischer and Heilig, 1997).

The United Nations identified the immense significance of these global demographics in Article 2 of the political declarations made at the Second
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World Assembly on Ageing in 2002 with the statement “that the world is experiencing an unprecedented demographic transformation and that by 2050 the number of persons aged 60 years and over will increase from 600 million to almost 2 billion and that the proportion of persons aged 60 years and over is expected to double from 10 to 21 per cent. The increase will be greatest and most rapid in developing countries where the older population is expected to quadruple during the next 50 years” (United Nations, 2002a).

Even more dramatically, we see the rapid growth of the population older than 80 years, who are growing globally at an annual rate of 3.8%, which is currently twice as high as the 1.9% growth of the population over 60 years of age (United Nations, 2002b). These are dramatic changes that will focus attention even more keenly on aging and associated phenomena.

As numbers change, so too will our social networks, our physical functions, and our cognitive agility. The prevalence of chronic disability is noticeable at age 65 years and increases as age increases (Table 1.1).

Table 1.1 shows data on self-reported health status from elders who are living independently, and undoubtedly, the prevalence of chronic conditions is much higher in the frailer population in nursing homes. The prevalence of dementia, for example, is remarkably low in this noninstitutionalized population. A survey of predominantly Caucasian elders aged 90 years and older in California reported that 45% of women and 28% of men were clinically demented, and the prevalence rates doubled every 5 years for women but not men (Corrada et al., 2008).

THE AGING MOUTH

Normal aging changes the mouth and associated structures in relatively mild ways as physiological capacity is reduced compared with the more
extreme reactions precipitated by disease. There is, for instance, age-related loss of mucosal elasticity, submucosal tissue, and tactile sensitivity around the mouth (Landt and Fransson, 1975; Nedelman and Bernick, 1978; Wolff et al., 1991). The sensation of taste also diminishes a little (Easterby-Smith et al., 1994), as does the mass and strength of the jaw muscles (Newton et al., 1993). Within the pulp of vital teeth, there is a decrease in the number of blood vessels and cells and an increase in secondary dentine deposits, all of which compromise a tooth’s capacity to recover from physical trauma and caries (Mandojana et al., 2001). Likewise, cells can lose their ability to proliferate and produce protein as they age. Consequently, we can expect a slight relocation of periodontal attachment and loss of bone support around teeth (Papapanou et al., 1989). The occlusal surfaces of teeth show signs of attrition (Bartlett and Dugmore, 2008), and the curved articulating surfaces of the jaw joints flatten a little as they age (Magnusson et al., 2008). However, it has been challenging to distinguish between the contributions of genes and of the environment to age-related changes because, frequently, the difference between normal “wear and tear” and active disease is obscure.

The balance between health and disease, as between impairment and disability, of the mouth is influenced by interactions of human behavior, the environment, and various diseases such as caries, periodontal disease, trauma and, to a lesser extent, cancer (Gutmann and Gutmann, 1995; Reichart, 2000; Levy et al., 2003; Petersen et al., 2005). Consequently, frail elders today present with repaired or missing teeth because of the ravages of caries over many years (Marcus et al., 1996; Thompson and Kreisel, 1998; Wyatt and MacEntee, 1998; Fure, 2003), and many of them have lost all of their natural teeth (Schoenborn and Heyman, 2009). Problems of the mouth can have a very disturbing affect on nutrition, communications, and social interactions at any age (MacEntee et al., 1997; Moynihan et al., 2000), but as frailty increases, oral neglect can contribute to life-threatening conditions in the respiratory, cardiovascular, and endocrine systems (Bonito, 2002; Awano et al., 2008). Although there is controversy around the strength of the contributions, and awareness of the capacity that elderly people have for coping with adversity (Brondani and MacEntee, 2007), there is little doubt that a neglected mouth can be very challenging to general well-being and quality of life (Gift and Redford, 1992; MacEntee, 2007; Sanders et al., 2009).

THE SILENCE OF THE FRAILE ELDERLY

Frailty complicates the care needed to manage oral diseases, and oral diseases complicate the management of frailty (Satcher, 2000a; Chalmers and Ettinger, 2008). Moreover, the neglect of oral health and acceptance of infectious diseases are complicated even further by elders who are too frail to complain (Satcher, 2000b; Helgeson et al., 2002).
There is much debate about the establishment of a comprehensive definition that describes the characteristics, causes, and management of frailty (Kaethler et al., 2003; Bergman et al., 2007). Helena’s circumstances at age 82 years demonstrate that physical frailty does not necessarily cause social isolation (Box 1.1). Although her upper denture adds a layer of complexity to her health, whether or not she is “frail” and what in fact exacerbates or improves her physical situation is less clear. Is she neglecting her mouth because she is frail? Does her physical disability impede her ability, and therefore her wish, to visit a dentist, or is she so accepting of her mouth and denture problems that she sees no point in visiting a dentist? These are questions that warrant good answers if we are to appreciate fully the role of physical function and oral health in Helena’s life.

**Box 1.1 Helena’s frailty.**

Helena just had her 82nd birthday. She enjoys reading and the time she can spend in her garden on sunny days. She has not walked for 7 years and gets around in an electric wheelchair. She describes her health overall as “the pits,” with numerous related concerns, including post-polio syndrome, rheumatoid arthritis, heart problems, breathing problems, and seizures. She has been hospitalized several times in the last year. Fortunately, her family is very supportive.

She lives with Joyce, her 50-year-old daughter, and Ken, her 28-year-old grandson. Joyce works as a registered nurse, while Ken quit his job to help out at home where he does a lot of the physical labor, including helping Helena in and out of her wheelchair. Helena explains that she would not be able to manage at home without Ken. She also receives homecare services four times a day for one hour each visit, including preparations of her meals.

She has six natural lower front teeth but she can eat only pureed food because of difficulties with her upper complete denture, which occasionally she does not wear. However, she has not been to a dentist for the past 5 years because she believes “there is no point.” Overall, she has a positive attitude to her life, and she enjoys her family and friends, including the homecare workers.

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**FRAILTY**

Some theories of frailty rest entirely on biological explanations of aging and senescence, whereas others carefully consider social and environmental factors. As a concept in medical care, frailty was seen initially as a biological attribute of health and disability stemming from age-related impairments in multiple biological systems, and it was ascribed pragmatically to people who seemed to cope poorly with the physical challenges of old age (Bergman et al., 2004). This largely biomedical concept was expanded by others to include a wider range of phenomena that increase
vulnerability to disease through numerous biological, psychological, cognitive, and social interactions (Rockwood, 2005).

At first glance, Helena fits the biomedical characteristics of frailty because her disability involves her mouth among other physiological systems. But frailty, if we accept the expanded concept, is a multifactorial phenomenon associated with vulnerability to various problems. Consequently, Helena is less likely to be considered frail in a global sense when we consider her social support and her apparent emotional capacity to deal with her physical problems. Almost everyone is physically frail by age 95 years; however, if the physical manifestations of frailty are tempered by an adequate capacity to cope with impairments, even centenarians can be relatively robust while people half their age can present as shockingly frail.

Instrumental definitions and objective measures of frailty, both of which are characteristic of the medicalization of aging, can be restrictive because they dwell mostly on medical needs to the exclusion of environmental and social issues, such as isolation and poverty (Kaufman, 1994; Markle-Reid and Browne, 2003). A more global assessment of Helena’s frailty, if such is possible, would highlight her biomedical vulnerability moderated by a complicated and variable social environment. Associating frailty with aging alone has negative implications, such as the unjust stereotyping of Helena as unduly pessimistic about her teeth because she is old. Moreover, quantifying frailty can lead to suggestions of homogeneity and uniformity among elders, which is far from real. Probably, there is more diversity and heterogeneity among older people than among any other age group. Aging and frailty are not simply a shift in the battle of independence versus dependence but rather a change in the capacity for autonomy and personal strengths along a broad continuum of possibilities (Markle-Reid and Browne, 2003).

“Frail” dental patients

The impact of frailty on oral health and mouthcare has been considered mainly as a feature of access to care, with patients classified as functionally independent, frail, or dependent (Ettinger and Beck, 1984). However, the impact can be considered even more simply in the context of independence and dependence. Either way, the classification, or at least the impact, of frailty is based solely on physical capacity to access dental services (Bonito, 2002). It does not explain how frailty influences the mouth and teeth. Helena, for example, is functionally dependent on Ken for help to attend a dentist; therefore, she is frail. Yet she chooses not to go to a dentist because “there is no point,” presumably because she has other priorities and feels that a dentist cannot help her. Therefore, her frailty has no direct influence at present on whether or not she goes to a dentist, and so access to dentistry does not influence her sense of frailty. She struggles to swallow food because of difficulties with her denture, and a dentist would probably
consider these difficulties as compelling evidence of need for a new or relined upper denture, and possibly, a lower partial denture. Helena, undaunted, copes with the difficulties by eating pureed food, which is an acceptable compromise given the overriding proclamation that her health is “the pits”! For Helena, frailty is a psychosocial phenomenon more than a physical dysfunction.

**The frail mouth**

People with poor dentition tend to select soft foods (Millwood and Heath, 2000), and because many of them have lost teeth due to caries, they might have a preference also for sweet foods. But is this preference influenced by a long-standing addiction to sugar that has damaged the dentition over many years, and so the addiction continues into old age and is bolstered by the impaired dentition? Disabled elders frequently have mucosal, gingival, and periodontal inflammation because of difficulty with oral hygiene, and they have difficulty managing dentures because their orofacial muscles have weakened. And so, the decline in nutritional state, oral function, and hygiene contributes further to frailty.

Typically, the dentures worn by people who are frail are assessed as clinically inadequate by dental professionals, yet the denture-wearers cope quite effectively with them (Mojon and MacEntee, 1992). Further complications arise from salivary gland hypofunction exacerbated by many of the medications associated with frailty. The result is a salivary deficiency, either in quantity or quality or both, that increases the risk of caries, complicates oral hygiene, precludes denture retention, and significantly reduces the resilience of the oral mucosa (Walls et al., 2000). The onset of dementia detracts even more from the selection of nutritious food and the ability to keep the mouth and dentures clean, which typically leads to caries, gingivitis, candidiasis, and denture stomatitis (Chalmers et al., 2003; Ellefsen et al., 2008). These conditions are rarely a source of obvious complaint or obvious discomfort to people who are demented (Chalmers et al., 2003). However, detection of pain is challenging in the presence of advanced dementia, and the impact on their social interactions and enjoyment of food might be much more distressing than we realize.

**COPING WITH FRAILTY AND ORAL DISORDERS**

Good oral health implies comfort, hygiene, and the absence of disease, but it also accommodates moderate impairment and disability to which elderly people seem reasonably and surprisingly tolerant (Davis, 1976; Brondani et al., 2007). This implication contrasts with the debate around oral health-related quality of life in which oral disease, impairment, and disability are portrayed as intolerable and disturbing experiences (Slade, 1997; Gilbert et al., 1998; Williams et al., 1998; Locker and Gibson, 2005; Nuttall et al.,
2006). Undoubtedly, this negative perspective on oral disorder and disability fits Helena’s physical status, but it is challenged seriously by the social network of her family from which she derives positive support and encouragement to offset her physical disabilities.

CONCLUSIONS

We have explained that oral health can influence frailty, just as frailty can influence oral health. They are inextricably connected, both for good and for bad. The case of Helena portrays the complicated connection between oral health and frailty by raising questions about how and why elderly people adapt and cope with physical impairment and disability. It is common for dentists and other dental personnel to identify multiple mouth problems in this population, but careful consideration to the emotional, social, and environmental contexts in which people live should prompt us to temper our professional care with a sophisticated appreciation for the tolerance that most elders have for their predicament and for the autonomy they wish to retain despite the challenges of frailty.

REFERENCES


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