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Oral care help to maintain nutritional status in frail older people

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ABSTRACT

The purpose of this study was to evaluate the effect of continuous oral care on the nutritional status of older people who require care using a 1-year randomized, controlled study. Fifty-three residents of a nursing home in Japan participated in this study. Subjects were randomly divided into two groups, an oral care intervention group and control group. The subjects in the oral care intervention group received professional oral care from a dentist three times a week over the course of 1 year. Body weight, body mass index (BMI), serum albumin, and high-density lipoprotein cholesterol (HDL-C) were measured as objective indicators of nutritional status at baseline and after 1 year, and compared between the groups. In the oral care group, no significant decline was seen in all indicators from the start to the end of the intervention, but in the control group there was a statistically significant decline in all indicators at the end of the year. These results suggest that the intervention of oral care alone can serve to maintain the nutritional status of older people who require care. Implementation of continuous oral care is an important task from the viewpoint of maintaining nutritional status in older people.

1. Introduction

Japan faces a globally unprecedented future as an aging society. It is widely acknowledged that by 2015 more than one in four Japanese will be over the age of 65, most of them born after World War II. In 2000 the number of people who required care or support was 2 million, but this number is expected to reach 5.3 million in 2025.

Nutrition management is an important social issue today. Attention, however, tends to be focused on the excessive nutrition intake associated with diabetes mellitus, obesity, or hyperlipidemia. In care-dependent older people, on the other hand, the problem is the opposite: a high rate of malnutrition (Womack and Breeding, 1998; Soini et al., 2006; Wells and Dumbrell, 2006). Although the problem of excessive weight is also present in older people, the main concern in people of advanced age is the reported decline in food intake and loss of the motivation to eat. Nutrition is an important determinant of health in persons over the age of 65 and malnutrition in the elderly is often underdiagnosed (Wells and Dumbrell, 2006). Reduced dietary intake results in a lack of energy and protein, leaving people susceptible to malnourishment. It is reported that about 60% of older people who require care are at risk for malnutrition, and that there is an increased rate of malnutrition as dependency on care increases (Izawa et al., 2006). In many cases the direct cause of death in older people is pneumonia or infection-related diseases, one cause of which is the existence of a risk for infection with underlying malnutrition in older people. Poor nutritional status invites a situation in which frail older people become more dependent on care, and is known to contribute greatly to decreased strength and death. Nutritional status therefore cannot be overlooked from the viewpoint of maintaining or improving quality of life (QoL).

Reduced energy intake leading to body weight loss may be caused by social or physiological factors, or a combination of both. Factors for malnutrition in older people include economic problems and other social factors, decreased physical activity, decreased basal metabolic rate, chronic debilitating disease, unbalanced meals or dietary intake, impaired cognitive function related to eating, decreased oral ingestion, and swallowing functions, activities of daily living (ADL), and decreased digestion and absorption functions. Among these factors, decreased oral function is one of the most important in the risk for malnutrition (Soini et al., 2006). Older people who require care are susceptible to oral function disorders as a result of impaired mental and physical functions caused, for example, by cerebrovascular disorder or dementia. Oral function is reported to be closely related to general functions including cognitive function, ADL, and nutritional status (Stewart and Hirani, 2007; Sumi et al., 2009), and it has been

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suggested that oral care, from which improvements in oral function can be expected, is needed for general nutrition management to prevent malnutrition (Arai et al., 2003).

In April 2006, the improvement of oral function was introduced among the new prevention benefits provided in the national long-term care insurance in Japan, because oral care is understood to be an integral part of medical care for the prevention of general disease and promotion of health. The approach to improving oral function in the care insurance system is based on the concept of obtaining nutrition enjoyably and safely through good-tasting meals. Therefore, prevention of dental disease, good oral hygiene, and good oral function are essential. Promoting wider recognition of the importance of oral care in society will require large amounts of data showing the very close relationship that oral hygiene and function have with general health status. In particular, the government will need to more effectively present its policies to general society with regard to the positive effect on general health of oral care interventions. However, while there have been several reported surveys on oral and nutritional status (Soini et al., 2006; Sumi et al., 2009), there are few on the maintenance or improvement of nutritional status in frail older people from oral care interventions alone, and intervention studies with two randomly divided groups are rare.

The purpose of this study was to evaluate the effect of continuous oral care on nutritional status in older people who require care, by conducting a 1-year intervention study of two randomly divided groups.

2. Methods

2.1. Subjects

The subjects were 53 residents of a special nursing home for the aged (mean age 83.2 ± 1.6 years; 18 males, 35 females), who fully understood the intent of this study. Written consent for participation was obtained from each subject or his or her family. The subjects were divided randomly into two groups, an oral care intervention group with 27 people, and a control group with 26 people. No significant differences were seen between the groups in body weight, BMI, serum albumin level, HDL-C level, ADL, sex, or age before the intervention.

2.2. Oral care intervention method

A dentist provided oral care three times a week (Monday, Wednesday, and Friday). In the oral care intervention group, professional oral care was given by the dentist using an oral care support instrument developed at the National Center for Geriatrics and Gerontology (Sumi et al., 2003). In the control group, oral cleaning was done following the oral care methods of the nursing home. The intervention period was 1 year.

2.3. General description of oral care support instrument

The oral care support instrument used in the study is based on the Plak Control D17511® (Braun Gillette Japan Inc.), a powerful electric toothbrush that has the world's top share and proven effectiveness. The novel brush design incorporates a supply system for an antibacterial agent (0.25% povidone–iodine solution) in the center of its head. Irrigating with the antibacterial agent effectively washes out food residue and the powerful electric toothbrush eliminates adhesive plaque (Figs. 1 and 2). A drip infusion system is used to supply the antibacterial agent at a rate of 5 ml/min. A Care Clinic® (Yamanaka Dental, Japan) is used to suction out saliva and the antibacterial agent that flows into the mouth. An on/off switch for the antibacterial agent is attached to the electric toothbrush, so the agent can be infused while the toothbrush is being held or operated. The suction device was designed so that it could be turned on and off with a foot controller. This instrument therefore enables simultaneous irrigation and suction by a single person while he or she uses the electric toothbrush to provide oral care for frail older people.

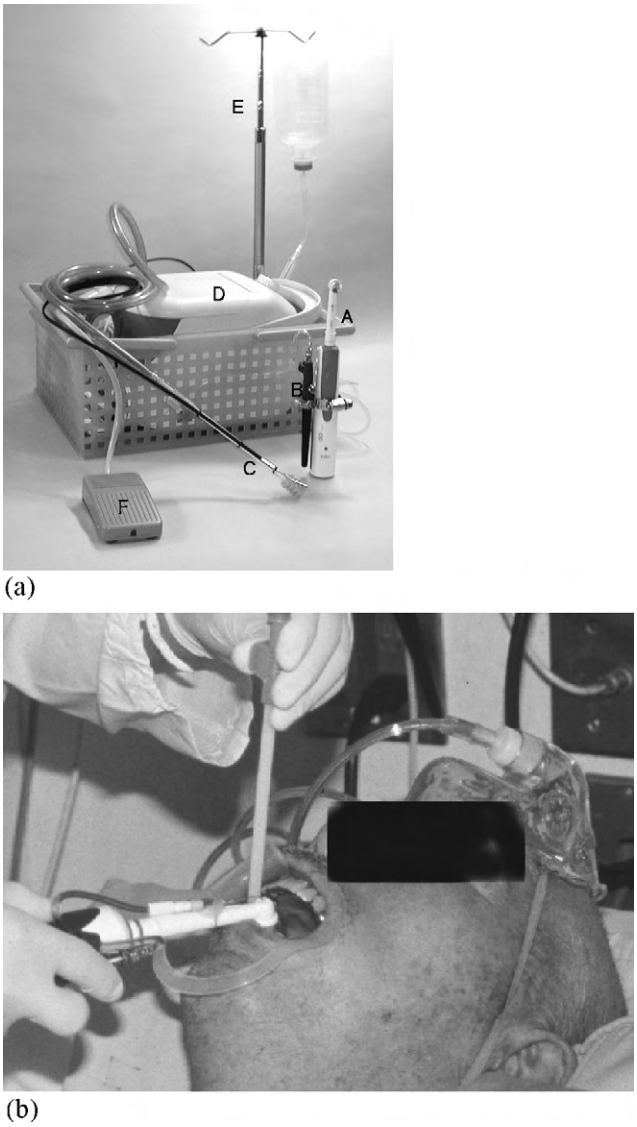

Fig. 1. (a) Overview of the oral care support instrument (Sumi et al., 2003): (A) brush head; (B) antibacterial-agent supply on/off switch; (C) suction head with light fiber illumination; (D) portable suction device; (E) drip infusion system; (F) foot controller. (b) Oral care support instrument in clinical use.

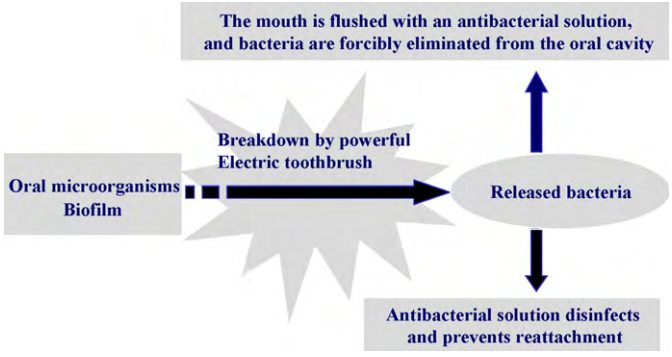

Fig. 2. Concept for oral care support instrument.