

Ultrasonic Cleaning of The Oral Cavity in Senile People

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Annotation:

The aim of this study was to evaluate the effectiveness of carers' education on improvements in oral health and denture hygiene of care-dependent and cognitively impaired older people in nursing homes compared to those without intervention. Carers' education improves oral health of people in nursing homes over a clinically relevant period of time. Implementation of ultrasound baths is a simple and effective measure to improve denture hygiene of both institutionalized elderly people and seniors with dementia and in severe need of care. From a clinical standpoint, it is noteworthy that the respective interventions can be easily implemented in everyday care routine.

Keywords: oral health, intervention, older people, nursing home, longitudinal.

INTRODUCTION

This study, therefore, aimed to evaluate the effectiveness of carers' education and implementation of ultrasound baths for denture cleaning on the oral health and denture hygiene of cognitively and motorically impaired older people after six months following the interventions, and to compare the outcome to a control group without interventions.

MATERIALS AND METHODS

This controlled trial was part of an interdisciplinary research project that was initiated and supported by the Federal Ministry of Social Affairs, Baden-Württemberg, Germany. The study deals with questions concerning medical services for residents of nursing homes, their quality of life and the improvement in both. The investigation procedures were approved by the local ethics committee of the University of Heidelberg (approval no S-002/2012). Fourteen nursing homes in southwest Germany were selected to be representative by the Federal Ministry of Social Affairs of the state Baden-Württemberg. No participant-related allocation to intervention or control group was performed by the research team because of possible side effects of the interventions in a nursing home on participants in the control group. The Federal Ministry of Social Affairs assigned the nursing homes instead at random to intervention and control homes (eight intervention homes/six control homes) [1]. The inclusion criteria for participation of the residents were that they had natural remaining teeth and/or dentures and did not plan moving home during the study period. It was further demanded that participants or their legal guardians – in case they were not sui leges (incapable of giving informed consent by law) – signed an informed consent document. No further inclusion criteria were used in order to examine a preferably wide spectrum of seniors. Two-hundred and seventy-seven residents agreed to participate and were included in the study. Cross-sectional characteristics are published elsewhere.

RESULTS AND DISCUSSION

To evaluate oral hygiene, the Plaque Control Record (PCR) and the Gingival Bleeding Index (GBI) were used. Both indices allot a calculation of the quotient of test-positive tooth surfaces and all surfaces (mesial, buccal, distal, palatal/lingual), resulting in a percentage value (0%–100%). For PCR, all tooth surfaces were tinted with a plaque indicator solution (Mira-2-Ton; Hager & Werken, Duisburg, Germany). Participants were then asked to rinse their mouth with water, followed by enumeration of positive tooth sites [2]. For the determination of GBI, a periodontal probe was used (CPC11.5; Hu Friedy, Tutlingen, Germany). The probe was gently inserted and slid through the mesial, buccal, distal and palatal/lingual gingival sulcus of each tooth. After approximately ten seconds, bleeding sites were counted and divided by the total number of available tooth surfaces. The Community Periodontal Index of Treatment Needs (CPITN) was administered with the same probe. Again, the probe was inserted in the gingival sulcus of each tooth with a controlled force of 20p. Using the CPITN, five codes are possible for each of the up to six sextants; these codes give information on periodontal health condition; code 0 mirrors healthy conditions, codes 1 and 2 gingivitis, and codes 3 and 4 moderate and severe periodontitis, respectively. Denture hygiene was administered using the Denture Hygiene Index (DHI). For the evaluation of DHI, dentures were tinted with a plaque indicator (Plaque Test; Ivoclar Vivadent, Schaan, Liechtenstein), rinsed with water and evaluated for plaque-positive sites by illumination of a polymerization lamp (Bluephase; Ivoclar Vivadent). Plaque-positive areas were separately counted for each denture and divided by ten (total possible sites) to give a score, which could range from 0% to 100%. Compare Zenthöfer et al [3].

The dental interventions featured both a two-day comprehensive education program for the carers and the implementation of ultrasound baths for denture cleaning. For the educational part of the interventions, as many carers as possible were targeted to participate in the lectures. Therefore, the lectures were offered twice for each nursing home. Finally, one carer from each ward of a nursing home participated at minimum in the education program. A total of 87 caregivers passed the complete training. To impart knowledge, a standardized PowerPoint presentation was used. Education on age-related changes and pathologies of the oral cavity and a standardized estimation tool of oral conditions were provided. Carers were taught feasible teeth brushing techniques, handling of interdental space brushes and mouth rinses. Furthermore, a care movie, produced and offered by the dental association of Baden-Württemberg, Germany, was shown to the attendees. To improve the estimations of the caregivers concerning oral health conditions, a validated assessment tool was introduced to the attendees; Revised Oral Assessment Guide.³⁰ In addition, all carers were trained in the handling of different kinds of removable dentures using demonstration models. In order to make an attempt in improving denture hygiene for all intervention homes, two ultrasound baths were each supplied (Sonorex Super RK 31H; Bandelin GmbH, Berlin, Germany); the caregivers were trained in the autonomous use of the baths during the study period. In terms of safety, it was recommended that the carers only use soapy water for the ultrasonic cleaning of the dentures. To fulfill hygienic requirements, resin molds were supplied to each denture wearer to guarantee a safe cleaning process in the bath. The second part of the interventions was of practical nature. Carers were asked to recommend seniors with whom they had problems in carer routine. First, the caregivers estimated the oral health by the use of the Revised Oral Assessment Guide (ROAG); second, they took out dentures (if applicable) and cleaned dentures and natural residual teeth by themselves under

the supervision of a study dentist. The dentist gave feedback and advice in all exercises. Finally, the contents of the lectures were handed out to all attendees of the homes on CD-ROM and also in a print version.

This study has demonstrated that the introduction of ultrasound baths is a very successful measure for sustainable improvement in denture hygiene. It should also be stressed that primarily high-maintenance older people (low BI) profited from the denture cleanings.

CONCLUSION

Within the limitations of this study, carers' education improves oral health of care-dependent nursing home residents with and without dementia over a clinically relevant period of time. The implementation of ultrasound baths for denture cleaning is a simple but effective measure to improve denture hygiene in both institutionalized older people and seniors with dementia and in severe need of care.

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