COMPLIANCE OF NURSING HOME RESIDENTS WITH A NUTRIENT- AND ENERGY-DENSE ORAL NUTRITIONAL SUPPLEMENT DETERMINES EFFECTS ON NUTRITIONAL STATUS

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Abstract: Objectives: Administration of oral nutritional supplements (ONS) is an effective strategy to treat and avoid malnutrition, a persisting issue in nursing homes. However, little is known about compliance in the NH population. This study aimed to analyse the effects of compliance of NH residents with a low-volume, nutrient- and energy-dense ONS on nutritional status and to identify residents’ characteristics associated with compliance. Design & Setting: Randomized, controlled trial in nursing homes. Participants & Intervention: 87 nursing home residents (87±6y, 91% female) with malnutrition or at risk of malnutrition were randomly allocated to an intervention group (IG) receiving 2x125 ml ONS (2.4 kcal/ml/d) for 12 weeks, or the control group (CG) with usual care. Measurements: ONS intake was recorded daily and compliance calculated. Low and high compliance were defined as ≤30% and ≥80% of provided ONS actually consumed, respectively. Body weight (BW), BMI, upper-arm (UAC) and calf-circumference (CC) and MNA-SF were assessed at baseline and after 12 weeks. Associations between compliance and changes of nutritional parameters and residents’ characteristics were analysed. Results: Compliance was high in 35.7% and low in 28.6% of the IG (n=42). BW change was significantly higher in subjects with high compliance (median +3.0 (interquartile range +2.1;+3.8) kg, n=15) than in those with low compliance (-0.2 (-2.2;+1.6) kg, n=12) and CG (-0.1 (-1.2;+0.6) kg, n=35; p<0.001), and significantly correlated with compliance in IG (r=0.691; p<0.001). Significant differences and correlations were also identified for BMI, UAC and MNA-SF. High compliance was more often observed in residents with malnutrition (66.7 vs. 27.3%) and chewing difficulties (77.8 vs. 24.2%) than in those without these conditions. Low compliance was more prevalent in residents who were immobile (45.0 vs. 13.6%), depressed (33.3 vs. 6.7%) or had gastrointestinal complaints (50.0 vs. 13.6%), determined significantly correlated to an improved nutritional status in comparison to low compliance and therefore enhanced the effectiveness of ONS. A higher compliance may be achieved by consideration of different residents’ characteristics.

Key words: Oral nutritional supplement, compliance, malnutrition, nursing home, intervention.

Introduction

Administration of oral nutritional supplements (ONS) is regarded as an effective strategy to avoid and treat malnutrition (1, 2), which is still a highly prevalent issue in nursing homes (3-5). To avoid the various detrimental consequences of malnutrition (5-8) it is important to intervene early to counteract deterioration of nutritional status (3, 9, 10). Although compliance is a key element for the success of a nutritional intervention with ONS that deserves special attention, most trials only include it as a side aspect. Results from nursing home studies reporting compliance with ONS are diverse, ranging from 54-91% (11-17).

Interestingly, a recent systematic review investigating compliance with ONS across different settings found that overall compliance is particularly good with higher energy-density ONS (18). Similarly, it has been suggested that compliance of elderly persons might be improved with higher energy density and concurrent low volumes (19). Especially in older people, often suffering from reduced appetite and low intakes, difficulties may arise when larger volumes need to be consumed (20). To overcome this possible barrier for ONS consumption and simultaneously reduce wastage and optimise both therapeutic and economic effectiveness of ONS prescriptions (21), recently a novel, low-volume, nutrient- and energy-dense formula was developed and first findings indicate an improved compliance in malnourished subjects (13, 22).

Although it is reasonable to assume that compliance has an impact on the effectiveness of nutritional interventions, there is to date limited information from nursing home studies on the specific effect of different compliance levels on residents’ outcome and in particular on nutritional parameters.

Furthermore, it is important to recognize that various factors can affect nutritional intake in general in elderly subjects and therefore compliance (19, 20, 23). There are external factors related to the environment or the food, which include mode and timing of ONS offering, adequate assistance of nursing staff during nutritional intervention, as well as taste and flavour of ONS, respectively (20, 24, 25). Person-related factors identified
so far are age and critical illness that are both negatively associated with compliance (18), but it seems plausible that there are also other relevant individual characteristics of elderly subjects in need of nutritional support. Functional impairment or specific nutritional problems might play a major role, however comprehensive research on compliance and its influencing factors in the nursing home population is missing. 

To obtain better knowledge on compliance with ONS in the nursing home setting, the objective of the present paper is to analyse compliance of nursing home residents with a low-volume, nutrient- and energy dense ONS in detail, as part of a randomised controlled intervention trial (26). Specific aims were 1. to determine the role of compliance for the effectiveness of the intervention and 2. to identify residents’ characteristics associated with compliance.

Methods

Study design and study population

This report is part of a randomized, controlled 12 week intervention trial investigating the effects of a nutrient- and energy dense ONS on nutritional status, functionality and quality of life, which was conducted between March 2009 and May 2010 in six nursing homes in Nürnberg and Fürth, Germany (26). The nursing homes were operated by a catholic welfare organization and hosted between 87 and 147 residents each, mostly in single rooms with a communal room on every ward, where the majority of residents spend most of their time.

Exclusion criteria were age <65 years, anticipated hospital stay (>1 week), renal disease (dialysis), end-stage disease and intolerance to ONS as reported during previous attempts to administer these. To identify residents at nutritional risk who would possibly benefit from nutritional intervention, a standardized screening was performed. All residents with a Mini Nutritional Assessment (MNA®) score below 24 points, BMI ≤22 kg/m², low recent food intake or weight loss ≥ 5% or 10% in the last 3 or 6 months, respectively, were regarded as at nutritional risk and invited to participate (5). Ethical approval was obtained from the ethical committee of the Friedrich-Alexander Universität Erlangen-Nürnberg and informed consent for participation from each resident or his responsible proxy.

Residents’ characteristics at baseline

Information on gender, age, level of care according to the German nursing insurance system (0 = <45 min, 1 = 45-120 min, 2 = 120-240 min, 3 = ≥240 min need of basic care per day), comorbidities, number of prescribed drugs per day and current use of nutritional support were collected at baseline from residents’ files. Mobility was recorded as mobile (able to move at least 3 m with or without walking aid including wheelchair), immobile sitting or bedridden. Ability to perform basic activities of daily living (ADL) were assessed according to Barthel & Mahoney (27) by interviewing the nursing staff. Values of 70-100 points were defined as independent, 35-65 as partially and 0-30 as fully dependent. Mini mental state examination (MMSE) (28) and geriatric depression scale (GDS) (29) were assessed in personal interviews with the residents to evaluate level of cognitive impairment and depressive mood, respectively. From a total MMSE score of 30 points, less than 24 indicate mild, and less than 17 severe cognitive impairment. A GDS score of 6-10 was defined as mild and >10 of a total score of 15 points as severe depressive symptoms. Presence of anorexia, eating dependency, swallowing difficulties, chewing difficulties and gastrointestinal complaints (GIC) were assessed in interviews with the responsible nursing staff.

Compliance

ONS intake was registered daily by nursing staff who estimated the proportion (¼, ½, ¾,1/1) of each ONS bottle consumed by the residents, preferably after the meals and at the end of the day to ensure enough time for consumption. Documentation was regularly controlled by the study team, who additionally measured leftovers (ml) and counted empty bottles during visits of the wards, daily during the first and last two weeks and at least 3 times per week during the rest of the study period. Compliance was calculated as the percentage actually consumed of the provided amount of ONS. The median compliance of the IG during the intervention period was determined by the average of the individual means of the participants. Low, medium and high compliance was defined as