The Journal of Nutrition, Health & Aging©
Volume 13, Number 2, 2009

USE OF FIBER INSTEAD OF LAXATIVE TREATMENT IN A GERIATRIC HOSPITAL TO IMPROVE THE WELLBEING OF SENIORS

B. STURTZEL[1], C. MIKULITS[2], C. GISINGER[2], I. ELMADFA[1]

1. Department of Nutritional Science, University of Vienna, Vienna, Austria; 2. "Haus der Barmherzigkeit", Geriatric Hospital, Vienna, Austria. Correspondence: Ibrahim Elmadfa, University of Vienna, Department of Nutritional Science, Althanstraße 14, 1090 Vienna, Tel: 0043-1-4277-54901, ibrahim.elmadfa@univie.ac.at

Abstract: *Introduction:* Constipation is a common problem in the elderly population, especially in geriatric wards. Laxatives are the most preferred solution but current studies link constipation and laxative use to weight-loss and malnutrition in nursing homes. Dietary fibers also affect stool weight and transit time. So, oat-bran effectiveness in reducing the need for bowel medication and weight-loss for geriatric care patients was examined in a geriatric hospital. *Aim:* To determine whether the addition of oat-bran to common oral diet can reduce the use of laxatives and improve the wellbeing and bodyweight of the inhabitants of a long-term-care facility. *Methods:* The study was designed as a controlled blind intervention trial among 30 frail inhabitants of a geriatric hospital aged 57-100 years with laxative use. Including criteria were: oral food intake and laxatives as therapy and excluding criteria were: parenteral and enteral feeding, surgeries in the gastro- intestinal tract, drugs that shorten or lengthen the passage through the gut, risk of aspiration, swallowing troubles. An intervention and a control group were formed. 15 of them received 7-8g oat-bran/d for 12 weeks (fiber group) mixed up in the daily common diet of the ward and 15 served as control (control group). Data collection: Bodyweight was taken at baseline, after 6 weeks and at the end of the supplementation. Data on laxative use, stool frequency and the eating habits of the elderly were recorded. *Results:* Laxatives were successfully discontinued by 59% ($p<0.001$) in the fiber-group; in the control-group there was an increase of 8% ($p=0,218$). Bodyweight remained constant in the fiber-group and decreased in the control-group ($p=0,002$). The oat-fiber supplementation in the introduced form was well tolerated. *Conclusions:* Use of oat-fiber allowed discontinuation of laxatives by 59% while improving body-weight and wellbeing of the seniors. Fiber supplementation is a safe and convenient alternative to laxatives in a geriatric hospital.

Key words: Seniors, laxatives, dietary fiber, weight, eating- habits.

Introduction

Constipation is a common problem in elderly persons, with prevalence ranging up to 50% to 70 % of nursing home residents (1). It results from a combination of risk factors, such as reduced fibre and fluid intake, less physical activity due to chronic diseases, altered eating habits and from multiple medications (2). Constipation (acc Rome 2 Criteria) – defined as two or fewer stools per week, straining during defecating, or hard feces with fecal impaction- is a chronic, recurrent concern (2, 3). Laxative use becomes more frequent, particularly amongst people living in long term settings (4). These interventions are not always without risk since frequent usage of laxatives may be accompanied by several side effects (5), including psychological ones, which severely affect the seniors' quality of life (6, 7). Undesirable side effects like straining (4), cramping, dehydration or fecal incontinence (3) and bowel atony or fluid-electrolyte balance disturbances (1) are frequent. In geriatric wards this is unpleasant for both caregivers and patients and incurs therapeutic and nursing time costs (8, 9). In nursing homes constipation and laxative use is more than a nuisance and is not part of the normal process of ageing (10). Persons with chronic constipation have a diminished perception of their quality of life (11, 12).

Generally, the intake of dietary fibers has been declining from about 40g/d 100 years ago to 15-20g/d nowadays in most western countries, whilst the recommended intake should be 25 -35 g/d (13). The fiber theory was confirmed by Burkitt (14) who had worked for many years in East Africa, observing the effects of dietary fiber on stool weight and transit-time. Traditional western medicine still offers primarily laxatives to deal with geriatric constipation (12). Some studies report that constipation and laxative usage are related to the elderly`s malnutrition and weight loss (15-17). Furthermore, studies exist which confirm a reduced supply of dietary fiber in the diet of seniors (18, 19). Insoluble fibers increase the stool weight through fibers which were not fermented by the gut's microflora and fermentable fiber increases stool weight through bacteria mass (20, 21); unlike laxatives which intervene in the stool transit by preventing the colon from resorbing water. Moreover, laxatives also perturb the physiological and biochemical interaction between the gut's contents, its epithelium cells and its micro flora (22).

To take advantage of the dietary fiber`s potential beneficial impact on the gut function, it is important to know how the missing fiber amount can be incorporated into the seniors` feeding plan without affecting their eating habits (12, 15).

So, recipes and meal-time ambiences through which the ward inhabitants would accept the intervention in the menu are to be developed, since good nutritional care improves the seniors` nutritional status (23). Equally important in nursing homes is that the staff members are sufficiently trained with

Received February 15, 2007
Accepted for publication January 28, 2008

regard to the nutritional needs of the elderly, which is not always the case.

Hence, maintaining a good quality of life for the patients will be the result of good team work among all staff (23, 24). In this project the nursing staff and doctors of the nursing home cooperated with a nutritionist.

Objective

To determine whether the addition of oat-fiber (oat bran) to the standard oral diet – over a test period of 12 weeks will allow reducing the use of laxatives, thereby improving the wellbeing of the inhabitants of a long-term-care facility.

Methods

Study design and Sample

The study was designed as a controlled paralell intervention-trial. The nursing-staff of the geriatric ward were informed about the expected benefits of the intervention, both with regard to the patients and the nursing staff. In meetings they were consulted on their wishes and doubts concerning the study. Together the recipes and an action plan were developed. The used fiber was a common oat-bran product of which contains 8,3g of non-digestible fermentable fiber, and 9,7 g of non-digestible non-fermentable fiber per 100g.

The nursing-staff were asked to name patients that would be willing to participate in the planned intervention. They selected patients based on the following criteria:

- including: oral food intake and laxatives as therapy or
- excluding: parenteral and enteral feeding, surgeries in the gastro-intestinal tract, drugs that shorten or lengthen the passage through the gut, risk of aspiration, swallowing troubles.
- Groups: 30 frail patients aged 57-98 years with laxative use gave their written consent to take part in the study. An intervention and a control group were formed. 15 people were assigned to each group.

The control-group was served the ward's habitual diet. The intervention group received oat fiber (ordinary oat flakes) blended into the daily lunch soup or dessert of the ward's standard diet, or incorporated into the afternoon cake. The nursing staff monitored the intervention and gave their advice if and when the recipes needed to be modified.

Measurements

Body-weight was taken from the geriatric ward's medical report of each patient at baseline, in the middle and at the end of the study. Also at baseline the Screening of the MNA (Mini Nutritional Assessment) was carried out. Dietary assessment was accomplished by means of the weighing records. After 10 days "running-in" time, the nursing staff recorded laxative use and stool frequency throughout the study duration. Also during the entire study, the first stated author was present at lunch and coffee times. Through participant observation (24), compliance, wishes and preferences of seniors and nursing staff received attention. As a consequence recipes with the required dietary fiber were continuously adapted to the elderly eating habits, while at the same time ensuring compliance.

Ethics

This project was accepted by the Ethics Committee of the city of Vienna. All patients were informed verbally by a physician and have given their written consent to the study.

Statistical methods

Statistical analysis was performed using the software SPSS 12.0. For the data-collection the intention-to-treat statistic was chosen.

The number of participants having been small (n=30) the non-parametric Friedmann-Test for repeated measuring was used to measure the differences within the groups. Differences between the two groups were tested using the Mann-Whitney Test. P-value < 0.05 was considered significant. Data were presented as mean (SD), range and percentage.

Results

To the oat bran intervention group 15 persons with a mean age (SD) of 86 (±9.0) and to the control group 15 persons with mean age (SD) of 84.6 (±11.4) years were allocated. The study participants had multiple chronic diseases. According to the Screening of the MNA in the oat fiber intervention group the mean (SD) of points was 7.33 (±1.63) and in the control group it was 7.47 (±1.40) (11 points or below = possible malnutrition). Fiber intake in the intervention group increased from day 0 to day 84 by 5.1 g. Mean (SD) energy intake in the fiber group was 1115.45 (±359.45) kcal/d and fluid intake was 1783.03 (±294.19) ml/d. The fiber intake of the control group decreased from day 0 to day 84 by 1.8 g. Mean (SD) energy intake in the control group was 1242.79 (±306.9) kcal/d and fluid intake was 1794.26 (±275.96) ml/d. The intervention was well tolerated. The seniors in the intervention group accepted the oat-bran in their daily soup, but preferred the desserts, especially the cakes (both containing oat bran). Together with the afternoon coffee they enjoyed the cakes which they could eat like finger food, needing little assistance from the nursing staff, who was equally pleased (see table 1).

The usage of laxatives (Polyethylene glycol, Diphenylmethane derivates) was successfully and significantly ($p< 0.001$) reduced by 59% in the fiber group, while in the control group there was an increase of laxatives of 8% ($p= 0.218$) during the study time (see table 2).

Bodyweight remained constant in the fiber-group ($p= 0.455$) but decreased in the control group ($p< 0.005$) (see table 3).

Stool-frequency remained constant throughout the study in both fiber and control group ($p=0.491$/ $p=0.770$). At the beginning mean stool-frequency was 3.3/per week in the oat-bran group and 3.2/per week in the control group.

Table 1
Examples of possible recipes used to incorporate oat bran

Porridge (-)	Refresher Cake with oat-bran*
Vegetable / Daily Soup with oat-bran (+)	Butter Cake with oat-bran*
Sweet Slurries with Cinnamon, Vanilla, Honey or Chocolate with oat-bran (+)	Spice Cake with oat-bran*
Vanilla-Milk with oat-bran*	Bircher-Benner-Muesli with oat-bran (-)
Egg-Cake with oat-bran*	Fruit yoghurt with oat-bran (-)
Spicy Pancake with oat-bran (+)	Apple- Yoghurt- Drink with oat-bran (-)
Chocolate Custard with oat-bran (+)	Curd-cheese custard with oat-bran (-)
Vanilla Custard with oat-bran (+)	Hot chocolate with oat-bran (+)

* = well accepted; (+) = accepted; (-) = not accepted

Table 2
Consumption of Laxatives (Mean (SD) of Laxative units used/patient/period) in the Fiber and the Control Group

	Fiber Group (n=15) Mean (±SD) + (Range)	**Control Group (n=15) Mean (±SD) + (Range)**
1.Period	13.07 (±5.78)	12.87 (±8.14)
Day 07- 33	(3 – 24)	(0 – 24)
2.Period	7.27 (±3.91)	12.33 (±8.21)
Day 34- 59	(1 – 14)	(0 – 23)
3.Period	5.40 (±4.22)	13.87 (±7.40)
Day 60- 84	(1 – 16)	(2 – 23)
p- Value (non parametric Friedmann Test)	p< 0.001 (*)	p= 0.218

(At the beginning differences between the groups were not significant p = 0.966, at the end there was a significant difference p= 0.003)

Table 3
Body-weight (kg) of the seniors at Day 0, 42 and 84 of the study

	Fiber Group (n=15) Mean (±SD) + (Range)	**Control Group (n= 13) Mean (±SD) + (Range)**
1.Measure	56.93 (±11.63)	61.56 (±10.63)
Day 0	(43.0 – 88.0)	(46.8 – 83.0)
2. Measure	57.20 (±11.63)	60.61 (±9.64)
Day 42	(43.0 – 88.0)	(46.0 – 75.0)
3. Measure	57.80 (±13.17)	58.84 (±9.70)
Day 84	(42.0 – 94.0)	(43.0 – 74.0)
p – Value (non parametric Friedmann Test)	p= 0.455	p= 0.002(*)

(At the beginning and at the end differences between the groups were not significant (p = 0.677/0.533); Data of 2 Persons in the control group were not completely collected)

Conclusion

All participants of this study suffered from multiple chronicle diseases, which is a common condition in geriatric medicine. This leads to specific preconditions in all phases of conducting geriatric research (25). Because of difficulties with recruitment sample size in our intervention study was small (26). The patients and the personal reacted sceptical that a nutritional intervention instead of medications could contribute to the wellbeing of the seniors. Because of this situation many seniors were not willing to take part in the study. Nevertheless, the oat bran treatment was well tolerated by the intervention group. High compliance was achieved; no drop-outs were noted, neither in the intervention nor the control group. Assuming that dietary habits evolve in childhood and early youth, it follows that the roots of the very seniors' food preferences go back to the first decades of the 20th century in Vienna (27). Throughout their lives, the recipes of this kitchen were quintessential for them; the elderly prepared those dishes themselves, or consumed them in restaurants.

So the oat bran that was blended into the daily meals was well accepted by the ward's seniors as well as the nursing staff, since the eating habits of the former and the working procedures of the latter were continually taken into consideration. The use of oat bran allowed discontinuation of laxatives of 59%. Additionally, several studies link constipation and laxative use in the elderly to malnutrition and weight loss (15-17). The results of our study confirm these observations. Moreover, the results from the MNA Screening indicated that all participants of our intervention were at risk for malnutrition and weight loss. The MNA is a tool which was designed to monitor nutritional status and to screen for protein and energy denutrition (28). Beyond this, in the control group the body-weight decreased (in parallel with a slight increase in the use of laxatives) and it is well reported that these weight loss is a leading risk factor for developing protein-energy deficiency, micronutrient deficiency or other nutrition related illnesses. All are associated with frailty and increased morbidity (29). In the fiber group body-weights remained constant while the use of laxatives decreased significantly. Therefore, this study shows that a feeding program rich in dietary fiber allows reducing the usage of laxatives in a geriatric ward. Likewise, the improved fiber intake leaded to a balanced weight status which insures adequate nutritional status among residents of geriatric wards (16).

Additionally, the team work of different professional groups (23, 29) facilitated the accomplishment of our intervention. By respecting the seniors' eating habits, high acceptance (of the foods), compliance and wellbeing were achieved. Patients commented "Nurse, look: I've been to the toilet on my own!" or "God answered my prayers, I don't need your medicine anymore to go to the toilet".

Comments like these attested to the successful and "dignifying" management of the bowel problems afflicting seniors in nursing homes (6), but it indicated also, that in this field of geriatric medicine further research should be conducted. It was shown that the impact of the standard social and cultural determinants of food habits (e.g. eating habits) particularly require to be considered. Furthermore, more information about the interaction between patients, nursing staff, eating habits or general meal atmosphere is required because recent studies showed that weight loss and altered nutritional status (MNA score) appear to predict severity and progression of cognitive impairment, mortality and institutionalization (28). Moreover, at the present time very few data are available on the food habits of the elderly (30).

Summarizing, we conclude that fiber supplementation is a convenient alternative to laxatives to cope with geriatric

constipation, contributes to the wellbeing of constipated-prone seniors and allows predicting improved weight management and nutritional status in geriatric nursing homes residents.

Acknowledgement: We thank all patients and interdisciplinary staff.

Contributors: The study was designed and accomplished by BS, CM and IE. CG was responsible for the clinical work. BS and IE interpreted the current findings and prepared the manuscript.

Financial disclosure: None of the authors had any financial interest or support for this paper.

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