Intervention with Dietary Fiber to Treat Constipation and Reduce Laxative Use in Residents of Nursing Homes

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Key Words

Elderly · Constipation · Laxatives · Dietary fiber · Body weight · Eating habits

Abstract

Background: Residents of nursing homes have lost their independence. Recent studies reported that nutritional problems arise in nursing homes. These problems are correlated with changed eating habits and geriatric constipation which is predominantly treated with laxatives. These interventions are not always without risk since frequent usage of laxatives may be accompanied by several side effects. Dietary fibers also affect stool weight and transit time. Therefore, oat-bran effectiveness in reducing the need for bowel medication was examined. **Aim:** To develop diets with the addition of oat bran for reduction of laxatives and to improve the inhabitants' well-being in a long-term-care facility. **Methods:** A controlled blind parallel intervention trial among 30 frail inhabitants of a geriatric ward aged 57–100 years with laxative use. An intervention and a control group were formed. 15 of them received oat bran for 12 weeks (fiber group) mixed up in the daily common diet of the ward and 15 served as control (control group). Laxative use, body weight and the observations concerning the eating habits of the elderly were documented. **Results:** A cake with the required dietary fibers and the complaisant acceptance of the seniors was developed. Laxatives were successfully discontinued by 59% ($p < 0.001$) in the fiber group. Body weight remained con-

stant in the fiber group and decreased in the control group ($p < 0.005$). **Conclusion:** Fiber supplementation in the form of a cake allows discontinuation of laxatives and increases the seniors' well-being in a nursing home.

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Introduction

Nursing home residents are generally very old and frequently suffer from multiple chronic diseases which lead to their dependency. They have to dismiss their own home, privacy and in the broadest sense their social-cultural environment. These factors lead to a high prevalence of loneliness, depression and a low perceived quality of life [1]. Consequently, the nursing home residents exhibit complex medical as well as psychosocial problems and have a variety of needs that may require extensive care. When these conditions occur, a poor nutritional status could be suspected. In a recent Swedish study, it was found that a leading factor related to a poor nutritional status in elderly people is constipation [2]. Another study reported that the age-related changes in eating habits and living conditions caused by the stay in a nursing home are to blame for this type of constipation [3]. In most nursing homes, constipation is treated with laxatives [4]. These interventions are not without risk since frequent usage of laxatives may be accompanied by several side effects [5], including psychological ones, which also severely affect

Fig. 1. Mean laxative use per patient per period (= 23 days) in the oat bran and control groups.

Fig. 2. Mean body weights at days 1, 42 and 84 in the oat bran and control groups.

the seniors' quality of life [6]. Laxatives intervene in the stool transit by preventing the colon from resorbing water irrespective of the physiological interactions between the gut epithelium cells and the gut bacteria. In contrast, dietary fibers increase stool weight through fibers which are not fermented and through bacteria mass [7]. To take advantage of the dietary fibers' potentially beneficial impact on gut function of the elderly, it is important to perceive how the missing fiber can be incorporated into the seniors' diet plans without affecting their eating habits [8, 9].

Therefore, recipes and mealtime ambiances whereby the ward inhabitants would accept the intervention in the menu had to be developed, since good nutritional care improves the seniors' nutritional status [10].

Aim

To determine whether the addition of oat bran to the standard oral diet during a test period of 12 weeks would allow reducing the use of laxatives, thereby improving the well-being of the inhabitants of a long-term-care facility.

Methods

Study Design and Sample

The study was designed as a controlled parallel intervention trial. The used fiber was a common oat bran product which contains 8.3 g of nondigestible fermentable fiber and 9.7 g of nondigestible, nonfermentable fiber per 100 g.

The nursing staff selected patients based on the following criteria:

Including. Oral food intake and laxatives as therapy.

Excluding. Parenteral and enteral feeding, gastrointestinal surgery, 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 blended into the daily lunch soup or dessert of the ward's standard diet, or incorporated into the afternoon cake.

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. Dietary assessment was accomplished by means of the weighing records. After 10 days' 'running-in' time, the nursing staff recorded laxative use. Through participant observation [11], 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 ensuring compliance at the same time.

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

Intention-to-treat statistic was chosen. As the number of participants was small ($n = 30$) the nonparametric Friedman test for repeated measuring was used to measure the differences within the groups. $p < 0.05$ was considered significant.

Results

Fifteen persons with a mean age (SD) of 86 (9.0) years were allocated to the oat bran intervention group and 15 persons with a mean age (SD) of 84.6 (11.4) years were allocated to the control group; all patients were suffering from multiple chronic diseases. 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 $4,670 \pm 1,505$ kJ/day and fluid intake was $1,783 \pm 294$ ml/day. The fiber intake of the control group decreased from day 0 to day 84 by 1.8 g. Mean energy intake in the control group was $5,203 \pm 1,285$ kJ/day and fluid intake was $1,794 \pm 276$ ml/day. 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). The usage of laxatives was reduced significantly ($p < 0.001$) by 59% in the fiber group, while in the control group an increase of laxatives of 8% ($p = 0.218$) was observed (fig. 1).

Body weight remained constant in the fiber group ($p = 0.455$) but decreased significantly ($p < 0.005$) in the control group (fig. 2).

Conclusions

By taking the eating habits of the ward's seniors into account, the oat bran intervention was well accepted in the oat bran intervention group. Additionally, body

weight remained constant in the intervention group, which fosters an appropriate nutritional status among residents of nursing homes [2]. The use of oat bran allowed a 59% discontinuation of laxatives. Assuming that dietary habits evolve during childhood, one may conclude that the roots of the seniors' food preferences go back 80–100 years. Recipes of these times determined their menus throughout their lives [12]. Considering this, the oat bran was blended into dishes adapted to their taste, which was well accepted by the ward's seniors.

In this regard, the study showed that optimizing the life style factor 'nutrition' in a geriatric institution could contribute to the well-being of the patients [13]. Summarizing, we conclude that fiber supplementation is a convenient alternative to laxatives to cope with geriatric constipation and allows an improved body weight management in nursing home residents.

Disclosure Statement

The oat bran was kindly provided by 'Koelln Flocken', Hamburg.

References

- 1 Nijs KA, de Graaf C, Kok FJ, van Staveren WA: Effect of family style mealtimes on quality of life, physical performance, and body weight of nursing home residents: cluster randomised controlled trial. *BMJ* 2006; 332:1180–1184.
- 2 Mamhidir AG, Ljunggren G, Kihlgren M, Kihlgren A, Wimo A: Underweight, weight loss and related risk factors among older adults in sheltered housing: a Swedish follow-up study. *J Nutr Health Aging* 2006;10: 255–262.
- 3 Wendland BE, Greenwood CE, Weinberg I, Young KW: Malnutrition in institutionalized seniors: the iatrogenic component. *J Am Geriatr Soc* 2003;51:85–90.
- 4 Marfil C, Davies GJ, Dettmar PW: Laxative use and its relationship with straining in a London elderly population: free-living versus institutionalized. *J Nutr Health Aging* 2005;9:185–187.
- 5 Elmadfa I, Leitzmann C: Ernährung des Menschen. Stuttgart, Eugen Ulmer GmbH, 2004.
- 6 Norton C: Constipation in older patients: effects on quality of life. *Br J Nurs* 2006;15: 188–192.
- 7 Schneeman BO: Building scientific consensus: the importance of dietary fiber. *Am J Clin Nutr* 1999;69:1.
- 8 Annells M, Koch T: Older people seeking solutions to constipation: the laxative mire. *J Clin Nurs* 2002;11:603–612.
- 9 Suominen M, Muurinen S, Routasalo P, Soini H, Suur-Uski I, Peiponen A, Finne-Soveri H, Pitkala KH: Malnutrition and associated factors among aged residents in all nursing homes in Helsinki. *Eur J Clin Nutr* 2005;59: 578–583.
- 10 Suominen M, Laine T, Routasalo P, Pitkala KH, Rasanen L: Nutrient content of served food, nutrient intake and nutritional status of residents with dementia in a Finnish nursing home. *J Nutr Health Aging* 2004;8:234–238.
- 11 Sydnor YM, Fjellstrom C: Food provision and the meal situation in elderly care: outcomes in different social contexts. *J Hum Nutr Diet* 2005;18:45–52.
- 12 Spiekermann U: Mixed diet in Europe. A historical overview; in Elmadfa (ed): Diet Diversification and Health Promotion. Forum Nutr. Basel, Karger, 2005, vol 57, pp 11–35.
- 13 Gillette Guyonnet S, Abellan Van Kan G, Andrieu S, Barberger Gateau P, Berr C, Bonnefoy M, Dartigues JF, de Groot L, Ferry M, Galan P, Hercberg S, Jeandel C, Morris MC, Nourhashemi F, Payette H, Poulain JP, Portet F, Roussel AM, Ritz P, Rolland Y, Vellas B: IANA task force on nutrition and cognitive decline with aging. *J Nutr Health Aging* 2007;11:132–152.