Fruit and fibre (Pajala porridge) in the prevention of constipation

Aase Wisten1 MD (Consultant in Geriatrics and Rehabilitation) and Torbjörn Messner2,3 MD, PhD (Associate Professor in Medicine)

1Section of Geriatrics and Rehabilitation, Department of Internal Medicine, Sunderby Hospital, Luleå, Sweden, 2Department of Internal Medicine, Kiruna District Hospital, Kiruna, Sweden and 3Medicine, Department of Public Health and Clinical Medicine, Umeå University Hospital, Umeå, Sweden

Scand J Caring Sci; 2005; 19; 71–76

Fruit and fibre (Pajala porridge) in the prevention of constipation

Background and Aims: Constipation is a common problem in geriatric wards and in the elderly population. Although high-fibre diets can help relieve constipation non-pharmacologically in many patients, traditional laxatives still remain the standard treatment. A fibre supplement in the form of raw bran is not always well tolerated. We wanted to study the effects of a daily consumption of a fruit- and fibre-rich porridge on stool frequency, perceived well-being and the costs for laxatives, when compared with traditional treatment with laxatives, in geriatric patients.

Methods: Twenty patients in secondary geriatric wards (hospital rehabilitation wards) were randomized into an intervention group (porridge group) and a control group (standard diet without porridge) for a 1-week run-in and 2-week study, with registration of clinical data, e.g. medical treatment, laxative consumption, stool frequency and perceived well-being.

Results: The patients in the porridge group had a daily defaecation without laxatives on average 76% of the time (10.7/14 days) compared with 23% of the time (3.3/14 days) in the non-porridge group (p = 0.003). The discomfort was less in the porridge group (2.5 vs. 6.5 on a 10-degree visual analogue scale, p = 0.008) when compared with the control group. The cost for laxatives was 93% lower in the intervention group (2.5€ vs. 37.5€) for the 2-week study.

Conclusions: A fibre-rich porridge was effective, well liked and tolerated and reduced the need for laxatives in geriatric patients. We conclude that a daily fibre-rich meal ought to be included in the treatment strategies of constipation in hospital wards.

Keywords: constipation, fibre, geriatric patients, dietary intervention.

Submitted 27 August 2003, Accepted 4 October 2004

Introduction

Constipation, defined as less than three bowel movements per week together with symptoms such as pain or straining (1), afflicts many people in the West. The consumption of laxatives increases with age. In a British survey, 22.6% of the women and 11.6% of the men in the age group 60–69 years reported the use of laxatives (2). In a study by The National Board of Health and Welfare in Sweden (3), it was shown that 69% of institutionalized persons (mean age 84 years) used laxatives. A long-term use of stimulating laxatives may result in anatomic changes in the colon (4) and should be avoided (5). Constipation is not a part of the normal process of ageing, but commonly related to factors such as chronic illness, a low intake of dietary fibres or fluid, physical inactivity or side-effects of medication (6). In healthy elderly persons, small bowel and colonic transit-times are normal (7, 8). Constipation may be regarded as a trivial symptom but impairs the functional status and quality of life in older people (9).

The intake of dietary fibre has been declining from about 40 g/day 100 years ago to 15–20 g/day in most western countries (10), whilst the recommended intake should be 25–35 g/day (11). During the Second World War, Cleave (12) was one of the first to advocate raw bran in the treatment of constipation, although for many years his ideas were not accepted (13). The ‘fibre theory’ was confirmed by Burkitt et al. (14), who had worked for many years in East Africa and observed the effects of dietary fibre...
on stool weight and transit-time. Many subsequent studies have documented the benefits of a high-fibre diet on bowel function and laxative consumption (15, 16), but there have been conflicting reports also (17). Traditional western medicine still mainly offers laxative drugs against constipation. One reason for this may be that it has been shown to be difficult to achieve the recommended dietary intake of at least 20 g/day (17).

In the 1970s, a fruit- and fibre-rich porridge was introduced in a nursing home in Pajala, a remote, rural village in the northernmost part of Sweden. During many years it was almost forgotten, but has recently been introduced in a few geriatric settings in the area. No formal study has been carried out of its effects. The first aim of this study was to evaluate the effects of the ‘Pajala porridge’ on stool frequency and the perceived well-being, when compared with traditional treatment with laxatives. The second aim was to compare the expenses for the laxatives in the porridge group with those of the control group.

Methods

Dietary intervention

We used a special porridge with a fibre content of 7.5 g/serving (see recipe) as calculated with a computer program (18). It was served as a part of a standard daily breakfast, consisting of 0.18 L porridge, by the staff in the ward. Other nutrients and drinks were allowed unrestricted.

Subjects

The present study was carried out in the geriatric wards of two small hospitals in northern Sweden. The main diagnoses are rehabilitation after surgery, stroke, and for adjustment of drugs in patients with multi-diagnoses, including dementia and Parkinson’s disease. The mean age is above 80 years.

We included 20 patients in geriatric wards mainly with the diagnoses of stroke, degenerative joint disease and Parkinson’s disease. We excluded patients with aphasia (could not use the visual analogue scale), dysphagia (could not swallow) and dementia (could not provide informed consent or use the visual analogue scale). Dysphagia and aphasia were diagnosed by a speech and language therapist and dementia was an assessment by a specialist geriatrician. Moreover, patients in a very poor general condition were excluded, but immobilization was no reason for exclusion. We randomized the patients into two groups with 10 patients in each. The allocation to the intervention or the control group was performed by drawing an opaque, sealed envelope where each respective group was stated, after both oral and written informed consent had been received.

Procedures

The observation started after a run-in period of 1 week, during which the intervention group was served porridge for breakfast and the control group had a standard breakfast. The porridge was prepared on the ward, usually three times a week and was stored in a refrigerator. After this, all patients continued in the group they were randomized into (irrespective of whether they ate the porridge or not; ‘intention to treat’), and were observed for two further weeks. This short observation period was chosen because otherwise some patients would have left the ward before completion of the study. The ward staff registered according to a protocol, stool frequency, the use of laxative therapy, and the patients’ self-estimated discomfort according to a visual analogue scale. The patients were three times during the study period asked to appreciate their abdominal discomfort like pain, flatulence, etc. on a visual analogue scale from 1 to 10 with 1 = no abdominal discomfort. Confounders such as age, daily use of drugs with constipation as a known side-effect (yes/no) and mobility (able to walk (mobile), or not (immobile)) were also noted. Drugs regarded as potential contributors to constipation were strong or weak opioids, drugs with anticolinergic side-effects (mainly antidepressants and drugs for treating Parkinson’s disease) and iron substitution. Subjects were given laxatives when needed following the normal ward routines regardless of study condition. Most commonly prescribed were the osmotic laxatives [lactulose, sodium citrate (rectal), macrogols] and the stimulating laxatives (sodium picosulphate, docusate sodium).

Statistical analysis

A power estimation based on our previous experiences with the porridge suggested the inclusion of seven patients in each study group. To have a safety margin, we decided to include 10 patients in each group. We tested group differences in the categorical variables (immobilization, use of analgesics and sex) with chi-square analysis. The differences in the continuous variables discomfort, days with defaecation without use of laxatives and days without defaecation, between the porridge and non-porridge groups were tested with Student’s t-test. In a final model, the same continuous variables were tested in three different regression analyses, controlling for sex, age, use of drugs with constipation as side-effects, and degree of immobilization. We used Stata SE version 8 (19) for all statistical analyses.

Ethics

The regional ethics committee approved the study (§269/02, dnr 02–250), and the patients gave their informed consent.
Results

In each study group, three of 10 patients used no drugs which could induce constipation as a side effect (Table 1). One patient in each group was on strong opioid medication and three in each group on weak opioids. Five patients in each group were on antidepressants (SSRI drugs); three in the porridge group on iron substitution and two in the non-porridge group had medication for Parkinson’s disease. Seven patients in each group had laxatives from the start of the trial, but none used laxatives before entering the hospital. Two patients in the porridge group, still needed laxatives after porridge intervention; seven patients (the same as from the start) in the control group needed laxatives.

In the univariate analyses, there were no statistically significant differences in age, sex distribution or the number of immobilized patients (Table 1). There were significantly more days with defaecation without use of laxatives and also significantly less discomfort (mean value) in the porridge group. There was no significant difference (p = 0.06) in the number of days without defaecation (Table 2).

In the multivariate analysis, adjusting for immobilization, age, sex and use of drugs with constipation as a side-effect, only porridge use significantly predicted more days with defaecation without laxatives, less discomfort and fewer doses of laxatives. The coefficients when testing for days without defaecation were not statistically significant (Table 3).

Discussion

A daily serving of a porridge rich in fibres to a group of geriatric patients was associated with better bowel function, improved comfort and a lower consumption of laxatives compared with a control group treated only with a traditional diet. The number of days without defaecation was not significantly lower in the porridge group, which is not surprising as the patients were given laxatives when needed to achieve bowel evacuation. The main reason for this study was to get a formal evaluation of the porridge and to spread our experiences with others dealing with constipation problems.

Dietary fibre consists of insoluble and soluble components. Soluble fibres (fruit fibre or pectin) have a high water retention capacity and reduce bowel transit time by having a lubricating effect on intestinal mucosa. Insoluble fibres (e.g. bran) primarily affect digestion by increasing stool bulk and promoting laxation. There have been conflicting results about the benefits of dietary fibre maybe caused by a grouping of all dietary and synthetic fibres, thereby masking a beneficial effect of specific dietary fibres (14, 20). A meta-analysis of the effects of wheat bran which incorporated 20 non-randomized controlled trials found that bran supplementation resulted in increased stool weight and decreased transit-time in both healthy and adults suffering from constipation (21). However, no simple relationship between constipation and dietary fibre intake is evident from community studies (22, 23). There are also other factors involved, which is shown in a study where subjects suffering from constipation reported consuming fewer meals per day and a tendency to consume fewer calories than the control subjects; but there was no difference between the groups regarding fibre or fluid intake (24).

The new feature of this study is the comparison of a dietary intervention and pharmacological treatment in prevention of constipation. The major strength is that we also studied the objective parameters of bowel function as a subjective evaluation of its effects from the patients’ perspective. There were only minor differences between the groups with respect to possible confounders like age, daily use of drugs with constipation as a side-effect, degree of immobility and chronic diseases, and these were adjusted for. The consistent results of the porridge, also giving statistically significant parameters in spite of the small group sizes and short treatment time, increases the validity of the study. A weakness of the study is that it was not blinded, and thus the expectations may have influenced both the patients and the ward staff. Likewise, we cannot exclude that the intervention group and the control

Table 1 Background data of the study population

<table>
<thead>
<tr>
<th></th>
<th>Porridge group</th>
<th>Non-porridge group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of men (total)</td>
<td>6 (10)</td>
<td>4 (10)</td>
<td>0.37</td>
</tr>
<tr>
<td>Mean age (years) (SD)</td>
<td>74.9 (13.6)</td>
<td>78.4 (8.5)</td>
<td>0.50</td>
</tr>
<tr>
<td>Number immobilized</td>
<td>4</td>
<td>2</td>
<td>0.33</td>
</tr>
<tr>
<td>Use of one drug with constipation as a side-effect</td>
<td>5</td>
<td>5</td>
<td>0.65</td>
</tr>
<tr>
<td>Use of two or more drugs with constipation as a side-effect</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 Univariate analysis of differences in the porridge and non-porridge groups

<table>
<thead>
<tr>
<th></th>
<th>Porridge group</th>
<th>Non-porridge group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days with defaecation without laxatives (SD)</td>
<td>10.7 (4.1)</td>
<td>3.2 (5.5)</td>
<td>0.003</td>
</tr>
<tr>
<td>Number of days with defaecation and osmotic/stimulant laxatives (SD)</td>
<td>0.8 (1.9)</td>
<td>5.2 (4.4)</td>
<td>0.009</td>
</tr>
<tr>
<td>Number of days without defaecation (SD)</td>
<td>2.5 (2.8)</td>
<td>5.6 (4.0)</td>
<td>0.06</td>
</tr>
<tr>
<td>Discomfort (SD)</td>
<td>2.5 (1.8)</td>
<td>5.6 (2.6)</td>
<td>0.008</td>
</tr>
</tbody>
</table>
groups were treated differently in other respects too, even if this seems less likely. The study did not involve an appreciation of the long-term effects on constipation or compliance. This has, however, been done in other studies (25), revealing a long-term effect of a high-fibre diet. Our experience after having served this porridge for 3 years in geriatric secondary wards is that patients both with and without a constipation problem find the porridge effective and tasty. They often continue to prepare the porridge after discharge to their homes, following a recipe handed out when they leave the hospital. The recipe is also sent to the patients who live in different geriatric settings (Table 4).

Constipation is a heterogeneous condition and among older people is often related to low intake of fluid and dietary fibres, small stools, reduced mobility, weak abdominal and pelvic muscles, chronic illness, psychological factors and medication, especially pain relieving medication (6, 26). In our study, none of the patients had laxatives at their entry into the hospital, i.e. they had a constipation problem secondary to factors such as illness, medication, immobility, etc.

Howard et al. (16) showed that institutionalized older adults given a bran mixture during a 4-month period completely discontinued oral laxative use without adversely affecting bowel frequency. Brobribb (27) showed, in a double-blind study in a group of patients with documented diverticular disease, that constipation symptoms were significantly reduced after 3 months of treatment with bran biscuits (6.7 g/day). The amount of fibres (7.5 g/portion) in our study is probably not the only reason why the porridge is effective against constipation. It contains a seemingly favourable mixed fibre supplementation of oats, flaxseeds, raisins, apricots and prunes. Although the major benefit of a high-fibre meal is the improved comfort of the patients, the costs for the laxatives also decrease. Sandman et al. (15) showed that the laxative consumption decreased by 93% in geriatric patients after treatment with a high-bran crisp bread during 5 weeks. In our study, the costs for the laxatives were 93% lower in the porridge group.

There is a lack of long-term large studies of non medical treatment of constipation in older people, but clear

---

### Table 4 Recipe for the ‘Pajala porridge’ (18–20 servings)

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Flax seeds</td>
<td>0.2 L</td>
</tr>
<tr>
<td>2 Prunes</td>
<td>0.2 L</td>
</tr>
<tr>
<td>3 Apricots</td>
<td>0.2 L</td>
</tr>
<tr>
<td>4 Raisins</td>
<td>0.1 L</td>
</tr>
<tr>
<td>5 Water</td>
<td>2.8 L</td>
</tr>
<tr>
<td>6 Salt</td>
<td>15 mL</td>
</tr>
<tr>
<td>7 Rolled oats</td>
<td>0.8 L</td>
</tr>
<tr>
<td>8 Oat bran</td>
<td>0.4 L</td>
</tr>
</tbody>
</table>

Mix ingredients 1–6 together in a large saucepan on day 1. Let stand over night. Next morning, add items 7–8 and bring to boil for 3–5 minutes during stirring. Add some water if needed.
evidence that fibres are beneficial in many cases of constipation. This knowledge has not yet, to a large extent, been transformed into a palatable food alternative that can be served every day in geriatric wards and homes for elderly. A reason for this might be the common belief that a fibre-rich meal is not easily accepted by older people. Our experience is that geriatric patients like the rather sweet and fruity taste of prunes, apricots and raisins of the porridge. It does not, in general, diminish the appetite, however, patients with a poor appetite are generally less inclined to trying new foodstuffs, irrespective of type. Several of the patients had diabetes mellitus and no untoward effect was noted amongst them. Most patients report a general sense of well-being from the porridge and no side-effects, while laxative drugs often result in abdominal discomfort such as flatulence and distension.

Cost aspects

The costs of laxative drugs in the porridge group was 0.25€ and in the control group 3.75€ per patient for the 2-week period.

Conclusions

This study showed that a daily serving of the ‘Pajala porridge’ reduced the need for laxative drugs in patients in a secondary geriatric ward, as compared with a control group assigned to a standard diet without the porridge. It is possible to introduce new food habits to older people and fibres can be served every day in geriatric wards and homes for elderly. A reason for this might be the common belief that foods with fibres can be served in an attractive and palatable way.

Acknowledgement

We thank the dedicated ward staff at the geriatric wards of Sunderby and Kiruna hospitals for their cooperation and support.

Author contribution

Dr Aase Wisten was involved in the conception of the study. Both authors took equal part in the design, research project, analysis and final preparation of the manuscript.

Funding/sponsorship

The Norrbotten County Council funded this project in the amount of 60 000 SEK.

Ethical approval

The Regional Ethics Committee approved the study (reference no. 269/02, cnr 02/250) and the patients gave their informed consent.

References

6 Merkel I, Locher J, Burgio K. Physiologic and psychologic characteristics of an elderly population with chronic constipation. Am J Gastroenterol 1993; 88: 1854.
19 StataCorp. Stata Statistical Software: Release 8.0. 2003, Stata Corporation, College Station, TX.


