REFERENCES

Soluble or insoluble fibre in irritable bowel syndrome in primary care? Randomised placebo controlled trial

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ABSTRACT

Objective To determine the effectiveness of increasing the dietary content of soluble fibre (psyllium) or insoluble fibre (bran) in patients with irritable bowel syndrome.
Design Randomised controlled trial.
Setting General practice.
Participants 275 patients aged 18-65 years with irritable bowel syndrome.
Interventions 12 weeks of treatment with 10 g psyllium (n=85), 10 g bran (n=97), or 10 g placebo (rice flour) (n=93).
Main outcome measures The primary end point was adequate symptom relief during at least two weeks in the previous month, analysed after one, two, and three months of treatment to assess both short term and sustained effectiveness. Secondary end points included irritable bowel syndrome symptom severity score, severity of abdominal pain, and irritable bowel syndrome quality of life scale.
Results The proportion of responders was significantly greater in the psyllium group than in the placebo group during the first month (57% *v* 35%; relative risk 1.60, 95% confidence interval 1.13 to 2.26) and the second month of treatment (59% *v* 41%; 1.44, 1.02 to 2.06). Bran was more effective than placebo during the third month of treatment only (57% *v* 32%; 1.70, 1.12 to 2.57), but this was not statistically significant in the worst case analysis (1.45, 0.97 to 2.16). After three months of treatment, symptom severity in the psyllium group was reduced by 90 points, compared with 49 points in the placebo group (P=0.03) and 58 points in the bran group (P=0.61 versus placebo). No differences were found with respect to quality of life. Fifty four (64%) of the patients allocated to psyllium, 54 (56%) in the bran group, and 56 (60%) in the placebo group completed the three month treatment period. Early dropout was most common in the bran group; the main reason was that the symptoms of irritable bowel syndrome worsened.
Conclusions Psyllium offers benefits in patients with irritable bowel syndrome in primary care.
Trial registration Clinical trials NCT00189033.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Increasing dietary fibre (either insoluble or soluble) is almost universally advocated for the treatment of irritable bowel syndrome
No trial has assessed its effects in the primary care setting, where the vast majority of these patients are managed

WHAT THIS STUDY ADDS

The addition of soluble fibre (psyllium) but not insoluble fibre (bran) was effective in the clinical management of patients with irritable bowel syndrome in primary care
The benefit of psyllium may be somewhat greater in patients who fulfil the Rome II criteria for irritable bowel syndrome
Bran may worsen symptoms of irritable bowel syndrome, especially at the beginning of treatment, and should be advised only with caution

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INTRODUCTION

In the management of irritable bowel syndrome, most general practitioners recommend an increase in fibre intake, through the addition of insoluble fibre in the form of bran.[1] Approximately half of patients with irritable bowel syndrome receive drug treatment, often including psyllium based supplements.[2] However, pooled analyses show limited evidence that fibre alleviates symptoms of irritable bowel syndrome, and insoluble fibre may even worsen the symptoms.[3-5] Most available studies on fibre treatment have severe methodological limitations, such as inadequate outcome assessment and lack of placebo control, and all trials were done in secondary care. In contrast, most patients with irritable bowel syndrome are treated in primary care, and this patient group may benefit more from fibre treatment than do those in secondary care.[1 6-8]

We did a randomised placebo controlled trial in primary care patients with irritable bowel syndrome to assess the effectiveness of treatment with either psyllium or bran on symptoms and quality of life.

METHODS

Setting, participants, and randomisation

We recruited patients in the practices of the Utrecht and Maastricht primary care research networks. Patients aged between 18 and 65 years who had been diagnosed as having irritable bowel syndrome in the previous two years were invited to participate. The inclusion period lasted from April 2004 to October 2006.

Patients were randomly allocated to a 12 week treatment regimen with 10 g psyllium (soluble fibre), 10 g bran (insoluble fibre), or placebo (rice flour) in two daily dosages. The average intake of dietary fibre in an adult Dutch population aged 25-65 years is estimated to be 24.0 (SD 6.9) g/day. An addition of 10 g fibre to the diet (total dietary fibre content 30-40 g) is usually considered adequate.[9] The study was blinded at three levels (patient, doctor, and research personnel), but the practice nurse was aware of the treatment allocated.

Outcomes measures

We used the adequate relief question ("Did you have adequate relief of irritable bowel syndrome related abdominal pain or discomfort in the past week?") as the primary outcome.[10 11] We assessed the primary outcome after one, two, and three months of treatment and defined responders as those patients who reported adequate relief of symptoms during at least two out of the previous four weeks.[12] Patients were asked to keep

Table 1 | Adequate relief of abdominal pain or discomfort (at least two weeks every four weeks): intention to treat analysis

Follow-up assessment and treatment	Responders (%)	Relative risk (95% CI)	% treatment difference (95% CI)	Number needed to treat
Month 1				
Psyllium	45/79 (57)	1.60 (1.13 to 2.26)	22 (7 to 38)	4.5
Bran	31/77 (40)	1.13 (0.81 to 1.58)	5 (−10 to 21)	16.7
Placebo	27/78 (35)	NA	NA	NA
Month 2				
Psyllium	39/66 (59)	1.44 (1.02 to 2.06)	18 (14 to 35)	5.6
Bran	32/63 (51)	1.22 (0.86 to 1.72)	10 (−7 to 27)	10.0
Placebo	27/66 (41)	NA	NA	NA
Month 3				
Psyllium	25/54 (46)	1.36 (0.90 to 2.04)	14 (−4 to 32)	7.1
Bran	31/54 (57)	1.70 (1.12 to 2.57)	25 (7 to 43)	4.0
Placebo	18/56 (32)	NA	NA	NA

NA=not applicable.

a weekly diary during the 12 weeks of treatment and to measure adherence to treatment. We calculated the primary outcome from weekly assessments.

Secondary outcome measurements included severity of symptoms of irritable bowel syndrome, severity of abdominal pain, and quality of life. Severity of symptoms was assessed with the irritable bowel syndrome symptom severity score. The severity of abdominal pain was measured by means of the first question of this score.[13] Disease specific quality of life was monitored with the irritable bowel syndrome quality of life scale.[14] Fibre intake was monitored every month during the trial with a food frequency questionnaire. The secondary outcomes were recorded during one, two, and three months.

Data analysis

Statistical analyses were based on the intention to treat principle. We calculated the proportion of responders in the three groups and compared them at one, two, and three months. Relative risks and risk differences compared with placebo were calculated. Changes in the secondary outcomes at one, two, and three months after the baseline measurements were also compared. To correct for possible differences in relevant baseline characteristics between the three groups, we did multiple logistic regression analyses.

Table 2 | Absolute and relative change in severity of symptoms, severity of abdominal pain, and quality of life from baseline by one, two, and three months of treatment

Follow-up assessment and treatment	IBS symptom severity score (0-500)			Abdominal pain score (0-100)			IBS quality of life scale (0-100)		
	Mean	%	P value	Mean	%	P value	Mean	%	P value
Month 1									
Psyllium	−69	26	0.19	−8	19	0.95	5	7	0.95
Bran	−61	22	0.47	−12	23	0.61	4	5	0.93
Placebo	−49	18	NA	−9	15	NA	3	4	NA
Month 2									
Psyllium	−69	26	0.92	−10	24	0.58	6	8	0.58
Bran	−53	20	0.32	−11	20	0.63	5	7	0.85
Placebo	−71	25	NA	−14	26	NA	5	7	NA
Month 3									
Psyllium	−90	34	0.03	−14	32	0.79	7	10	0.79
Bran	−58	22	0.61	−12	21	0.98	4	5	0.07
Placebo	−49	18	NA	−12	21	NA	4	6	NA

IBS=irritable bowel syndrome; NA=not applicable.

RESULTS

Participants

A total of 296 patients agreed to participate in the trial. In total, 275 patients attended the baseline visit and were randomised; 85 were allocated to psyllium, 97 to bran, and 93 to placebo. More than half (56%) of the patients had constipation predominant irritable bowel syndrome. The mean intake of dietary fibre before participation was 26.9 (SD 11.8) g/day, and patients used on average 2.4 (1.0) l/day of fluids. At baseline, patients allocated to psyllium reported less severe abdominal pain associated with irritable bowel syndrome than did those in the bran and placebo groups.

Two hundred and thirty four (85%) patients attended the second visit at one month, 195 (71%) attended the visit at two months, and 164 (60%) attended the final visit at the end of the three month treatment period. In total, 111 (40%) patients were lost to follow-up during the treatment period: 31 (36%) in the psyllium group, 43 (44%) in the bran group, and 37 (40%) in the placebo group. Reasons given were non-medical (n=15), presumed lack of benefit (n=10), symptom free (n=2), and intolerance of trial treatment (n=34; 7 patients allocated to psyllium, 18 patients allocated to bran, and 9 patients allocated to placebo).

Primary outcome

Rates of response were significantly higher with psyllium than with placebo during the first month of treatment (45/79 (57%) *v* 27/78 (35%); relative risk 1.60, 95% confidence interval 1.13 to 2.26), with a risk difference of 22% (95% confidence interval 7% to 38%). The number needed to treat was four. We saw a similar positive effect during the second month of treatment (39/66 (59%) *v* 27/66 (41%); relative risk 1.44, 1.02 to 2.06). During the third month of treatment the difference between psyllium and placebo–25/54 (46%) *v* 18/56 (32%)–was not statistically significant (relative risk 1.36, 0.90 to 2.04). Only in the third month of treatment was bran more effective than placebo (31/54 (57%) *v* 18/56 (32%); relative risk 1.70, 1.12 to 2.57) (table 1).

Adjustment for baseline symptom severity in the multivariate logistic regression analysis only increased the observed beneficial effect–in the first month of treatment the relative risk for adequate relief in the psyllium group versus the placebo group was 2.70 (1.33 to 5.46). In the worst case analysis (considering patients lost to follow-up as non-responders), psyllium remained more effective than placebo during the first two months of treatment, but bran was no longer superior to placebo during the third month (1.45, 0.97 to 2.16).

Secondary outcomes

The reduction in severity of symptoms in the psyllium group was higher than that in the placebo group, with a significant mean reduction of 90 versus 49 points (P=0.03) only after three months of treatment, whereas the change in severity of symptoms in the bran group was comparable to that in the placebo group. We found no significant differences between the three groups with respect to changes in the severity of abdominal pain related to irritable bowel syndrome or in quality of life (table 2).

Adherence

Adherence to the trial treatment did not differ between the psyllium and bran groups. Patients allocated to psyllium added on average 7.1 (SD 3.1) g/day, bringing their total intake of dietary fibre to 35.1 (14.9) g/day. Patients allocated to bran added on average 6.5 (3.3) g/day and consumed 34.1 (17.2) g/day dietary fibre in total. Fibre intake did not change during the treatment period. Total fluid intake, on average 2.5 (SD 0.8) l/day, did not differ between the groups.

DISCUSSION

In this randomised trial in primary care patients with irritable bowel syndrome, psyllium resulted in a significantly greater proportion of patients reporting adequate relief of symptoms compared with placebo supplementation. Patients receiving psyllium also reported a significant reduction in severity of symptoms of irritable bowel syndrome. We found no differences between the treatment groups in abdominal pain or health related quality of life. Bran showed no clinically relevant benefit, and many patients seemed not to tolerate bran.

Potential limitations

The selection process may have affected the generalisability of the results. A detailed comparison of randomised patients with eligible but non-randomised patients with irritable bowel syndrome (n=371) and non-eligible patients with irritable bowel syndrome (n=724) is reported elsewhere and showed that randomised patients had a higher intensity of abdominal pain, a higher consultation rate, and a longer history of irritable bowel syndrome.[15]

Successful blinding of dietary interventions in research is difficult to achieve, but we took maximum precautions to guarantee that the treatments looked identical. Clinical staff involved were kept blinded to treatment allocation. However, in retrospect approximately three quarters of patients correctly guessed which treatment they were given. We have no clear explanation for this.

Forty per cent of the patients in this study stopped participation before the final visit. The main reason was that they felt worse when taking the fibre supplement. Although this dropout rate is considerable, it is comparable to that in other trials of this nature.[16-18] Obviously, a high dropout rate is going to contribute negatively to the overall result of the study. Although this "worst case scenario" is the most appropriate way of analysing the effectiveness of treatment, it may underestimate the true effectiveness of fibre treatment.[11]

The dropout rate was highest among those patients randomised to bran. This was mainly attributed to worsening of symptoms of irritable bowel syndrome. This has also been reported in secondary care.[19 20]

Implications of findings

The results of this large scale trial in primary care support the addition of soluble fibre, such as psyllium, but not bran as an effective first treatment approach in the clinical management of patients with irritable bowel syndrome.

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Competing interests: None declared.

Ethical approval: The medical ethics committee of the University Medical Center Utrecht approved the study protocol. All patients gave written informed consent.

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