ARROWROOT AS A TREATMENT FOR DIARRHOEA IN IRRITABLE BOWEL SYNDROME PATIENTS: a pilot study

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ABSTRACT – Objectives - *Arrowroot is an old-fashioned remedy for diarrhoea, but no clinical studies have been done to evaluate its effectiveness. The aim of this pilot study was to assess its efficacy as a treatment for diarrhoea in 11 patients, all of whom had irritable bowel syndrome with diarrhoea as a feature.* Methods - *The patients were interviewed and a questionnaire completed on entry into the trial. They then took 10 mL arrowroot powder three times a day for one month and discontinued the treatment for the subsequent month. Questionnaires were completed after one month on treatment and at the end of the trial after one month off treatment.* Results - *Arrowroot reduced diarrhoea and had a long-term effect on constipation. It also eased abdominal pain.* Conclusion - *Arrowroot is an effective treatment for diarrhoea. Its action could be explained by several theories which relate to an increase in faecal bulk and thus a more efficient bowel action. The number of patients was small, and further studies are needed to substantiate preliminary results.*

HEADINGS – *Arrowroot. Starch. Diarrhea. Irritable bowel syndrome.*

INTRODUCTION

Arrowroot is an edible starch, commercially available as a white powder, obtained from the roots of the plant family Marantaceae, that grow predominantly in the West Indies[1, 2, 9].

It is a well-known traditional remedy for diarrhoea when administered boiled in water or milk and seasoned[2, 9]. It is described as having a "soothing and softening effect on mucus membranes" as well as being nutritious[2]. Some support for its efficacy as an antidiarrhoeal comes from a laboratory study on rats which revealed that it decreased cholera toxin-induced net water secretion[5]. However, little, or no work has been done on its effect on man. The purpose of this study was to evaluate a possible role in patients with a protracted history of diarrhoea, as defined by the frequent passage of a loose stool, who had irritable bowel syndrome.

MATERIAL AND METHOD

Oral and written consent were obtained from 11 patients, 6 male and 5 female, attending the Gastroenterological Outpatient Department of a Leicester teaching hospital. The age range was 23-56 (mean age = 38.5) and there was no significant difference in age between men and women. All patients were Caucasian except for one male who was of Asian origin. They all had long-standing irritable bowel syndrome with diarrhoea as a dominant feature which had

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failed to respond satisfactorily to conventional treatment. The diagnosis was based on negative colonoscopies and biopsies, and the Manning Criteria[4]. None of the patients expressed a particular interest in alternative medicine.

Prior to entry to the study, the patients were asked to complete a questionnaire about their general health and details of their bowel habit and medication in the preceding weeks were recorded.

The trial was of an open design in which patients were given powdered arrowroot obtained via Thornton & Ross UK Pharmaceutical Company and asked to take two 5 mL spoonfuls of the powder three times a day with, or as part of, their meals. They were reassessed after one month when the original questionnaire, along with a progress report relating to the effect of arrowroot, including any side effects, were completed. Patients were then asked to discontinue the arrowroot. They were reviewed one month later to assess any lasting benefit. Again, details were recorded on a questionnaire. Analysis of categorical data was performed using a z-test, whilst analysis of continuous data was performed using a paired t-test, and reported as mean differences together with associated 95% Confidence Intervals (CI).

RESULTS

Of the eleven patients entered in the study, one patient withdrew because he developed constipation. He failed to complete the questionnaire after one month on arrowroot and one further patient did not complete the final questionnaire at 2 months.

All patients reported benefit with arrowroot. One patient described the benefit as "complete". Five patients reported "moderate" improvement in their symptoms. One of these felt it was "better than moderate, but not complete", and another commented on a "50% improvement". Four patients had a "slight improvement".

Patients reported a significant improvement in abdominal pain ($z = 2.3$, $P = 0.02$) and felt diarrhoea was less of a problem ($z = 2.0$, $P = 0.05$) during treatment (Table 1). There was a marked reduction in constipation in the month after treatment, however, it did not make bowel habits significantly more regular and had no effect on the odour of stools or on mucus production.

Although only four patients reported an improvement in their diarrhoea, there was a mean fall in daytime frequency of defaecation of 2.95 (95% CI 1.65 to 4.45) $P = 0.001$ during treatment compared to pre-treatment levels, and a mean fall in day frequency of defaecation of 1.89 (95% CI 0.14 to 3.64) $P = 0.04$ at one month off treatment compared to pre-treatment levels (Table 2). There was also a mean fall in night frequency of defaecation of 0.95 (95% CI – 0.49 to 2.39) $P = 0.17$ during treatment compared to pre-treatment levels, and a mean fall of 0.83 (95% CI 0.00 to 1.67) $P = 0.05$ at one month off treatment compared to pre-treatment levels (Table 3).

Compliance appeared to be good, but one patient only took the arrowroot twice a day due to work commitments and irregular meals.

Table 1 – Symptoms

	(a) Pre treatment (n = 11)	(b) End of treatment (n = 10)	(c) One month off treatment (n = 9)	z-test comparing columns (a) & (b)	z-test comparing columns (b) & (c)
Symptom					
Number of patients with diarrhoea	10	6	7	z = 1.7	z = 0.8
Patients who considered diarrhoea a problem	9	4	4	z = 2.0 $P = 0.05$	z = 0.2
Constipation	4	4	0	z = 0.2	z = 2.1 $P = 0.03$
Patients who considered constipation a problem	1	3	0	z = 1.2	z = 1.8
Irregular bowel habit	5	4	4	z = 0.3	z = 0.2
Abdominal pain	11	6	7	z = 2.3 $P = 0.02$	z = 0.8
Offensive stool	8	5	7	z = 1.1	z = 1.3
Mucus	7	3	6	z = 1.5	z = 1.6

Table 2 – Bowel frequency – Day

Patient	Frequency of defaecation		
	Pre-treatment (a)	End of treatment (b)	One month post treatment (c)
1	2-4	1-2	2-4
2	4-8	2-4	4-8
3	7-8	2-4	/
4	4-8	2-4	2-4
5	10-12	4-8	6
6	4-8	2-4	0-1
7	2-4	1-2	2-4
8	2-4	2-4	2-4
9	6-7	4-5	4-8
10	4-8	/	/
11	>8	2-4	4-8
Mean difference with (a)		2.95 * 95% CI 1.65 to 4.45 P = 0.001	1.89** 95% CI 0.14 to 3.64 P = 0.04

*At the end of treatment, frequency had fallen significantly (t = 5.1, *P* = 0.0001)

** This was maintained for at least one month (t = 2.5, *P* = 0.03). The difference at the end of treatment and one month later was not significant (t = 1.5 NS)

TABLE 3 – Bowel frequency – Night

Patient	Frequency of defaecation		
	Pre-treatment (a)	End of treatment (b)	One month post treatment (c)
1	0	0	0
2	4-8	0	4-8
3	0	0	/
4	0	0	0
5	2-4	2-4	0
6	1-2	1-2	0
7	0	0	0
8	1-2	0-2	0
9	1-2	1-2	1-2
10	0	/	/
11	2-4	0	1-2
Mean difference with (a)		0.95 * 95% CI - 0.49 to 2.39 *P* = 0.17	0.83 ** 95% CI 0.00 to 1.67 *P* = 0.05

*At the end of treatment, frequency had not fallen significantly (t = 1.5 NS)

** However there was a significant decrease in bowel frequency pre treatment and one month post treatment (t = 2.3, *P* = 0.05). The difference at the end of treatment and one month later was not significant (t = 0.3 NS)

SIDE-EFFECTS

One patient developed an unacceptable exacerbation of pre-existing dyspepsia and one became very constipated. Mild side effects were reported by four other patients, with dark stools in one patient, a more offensive stool in another and constipation in two patients.

DISCUSSION

Qualitatively every patient reported some benefit with arrowroot. Statistically, Table 2 shows that arrowroot is very effective in reducing daytime bowel frequency by the end of the treatment period. This change is maintained up to one month after ending treatment. It is less clear at night (Table 3) but there is some evidence to suggest a prolonged reduction in bowel frequency, but this is not as marked as seen during the day. Nocturnal diarrhoea is an unusual finding in patients with irritable bowel syndrome and these patients had been thoroughly investigated to exclude other causes. A source of inaccuracy is the patients recall of their bowel habit in the weeks prior to the initiation of treatment and a placebo effect accounting for the response cannot be excluded. However, the results give encouragement to the view expressed by the old-wives tales that arrowroot is an effective treatment for diarrhoea and thus possibly for irritable bowel syndrome.

An unexpected finding was that some patients reported an improvement in "constipation" after treatment with arrowroot (Table 1). This might have occurred because patients used their own language, and difficulty in defaecation with incomplete bowel evacuation and abdominal bloating resulting in more frequent attempts to open the bowels may have been perceived as "constipation". Arrowroot may have an effect in normalising bowel function. It appears, however, not to have an effect on mucus production and larger studies may resolve these questions.

Several studies have shown that starch is incompletely absorbed by the small intestine[3, 6, 7, 8]. STEPHEN et al.[7] found that up to 20% of dietary starch enters the colon where it is metabolised by colonic bacteria to form short chain fatty acids that are then absorbed. This bacterial fermentation not only reduces faecal pH, but also increases faecal bulk, resulting in a more efficient bowel action, and may account for less abdominal pain[3, 6]. Long term, it may also protect against colonic neoplasm[8].

An alternative theory is that the availability of more starch acts as an extra source of substrate for bacterial growth in the colon, which may result in sparing dietary fibre from bacterial degradation which can retain more water and thus increase faecal bulk[6, 8].

In vitro, faecal bacteria have been shown to degrade mucus[7]. Increasing dietary starch with arrowroot may result in more starch entering the colon. This acts as a substrate for the colonic bacteria stimulating their proliferation and rate of turnover[6]. This may account for the reduction in mucus production experienced by some patients in this study.

The amount of arrowroot prescribed was chosen at random. Patients with little benefit may require a higher dose, while those with constipation may need less. More work is needed to evaluate and standardise the dose of arrowroot.

It needs to be stressed that this was a pilot study and the number of patients was therefore small, but a formal randomised controlled trial is now justified.

Cooke C, Carr I, Abrams K, Mayberry J. Araruta como um tratamento para a diarréia em pacientes com síndrome do intestino irritável: um estudo piloto. Arq Gastroenterol, São Paulo 2000;37(1):20-4.

RESUMO – Objetivos - *Araruta é um antigo (absoleto) remédio usado para a diarréia, porém estudos clínicos não têm sido realizados para avaliar sua efetividade. O objetivo deste estudo piloto foi avaliar sua eficácia como um tratamento para diarréia em 11 pacientes, todos eles portadores de síndrome do intestino irritável, com diarréia, como uma manifestação clínica.* Métodos - *Os pacientes foram entrevistados e um questionário foi preenchido à admissão no estudo (protocolo). Em seguida, receberam 10 mL de araruta em pó, três vezes ao dia durante um mês e descontinuaram este tratamento no mês subseqüente. Os questionários foram preenchidos após o mês de tratamento e ao fim do estudo após o mês de abstinência.* Resultados - *Araruta reduziu a diarréia e manteve um efeito de constipação por longo prazo. Ela também aliviou a dor abdominal.* Conclusão - *Araruta é um efetivo tratamento para diarréia. Seu mecanismo de ação poderia ser explicado por várias teorias relacionadas a um aumento do bolo fecal e, conseqüentemente, uma ação intestinal mais eficiente. O número de pacientes foi pequeno, assim estudos adicionais são necessários para substanciar os resultados preliminares.*

DESCRITORES – *Araruta. Amido. Diarréia. Síndrome do intestino irritável.*

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