

# THE LOW FODMAP DIET IMPROVES GASTROINTESTINAL SYMPTOMS IN PATIENTS WITH

# IRRITABLE BOWEL SYNDROME: A PROSPECTIVE STUDY.

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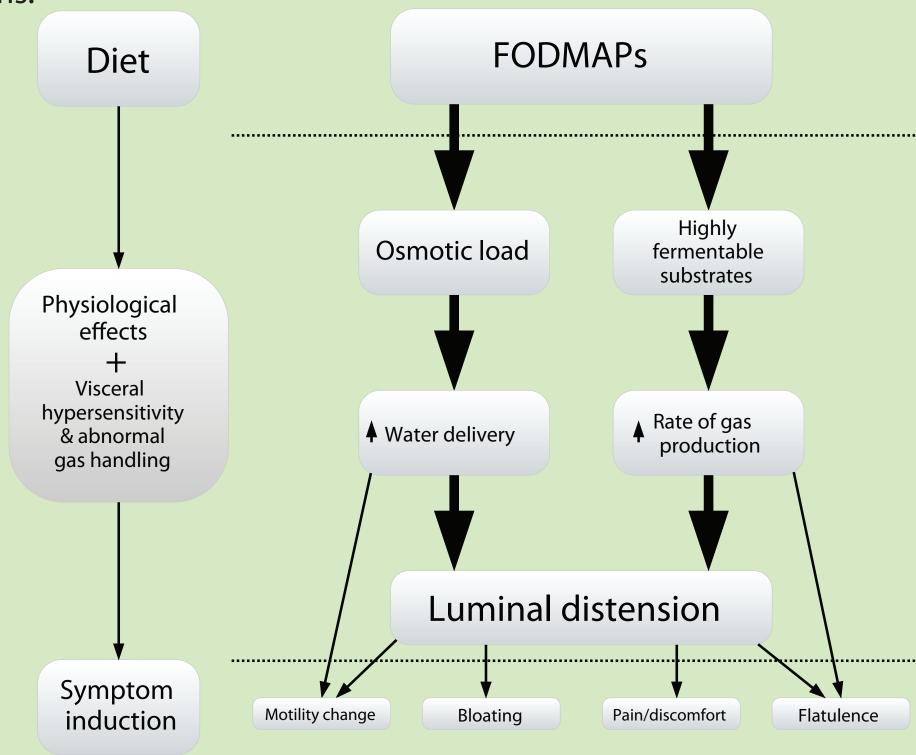
# Introduction

Irritable bowel syndrome (IBS) is a common gastrointestinal disorder with a prevalence of 10-20% in the adult population.

IBS contributes to a decrease in quality of life and places a major economical burden on patients, health care systems and the wider community.

Symptoms associated with IBS are abdominal pain, bloating, passing of gas, constipation and/or diarrhoea and

The relation between diet and abdominal symptoms is well recognized, and many dietary components may elicit gastrointestinal symptoms.



# Aim

Our aim was to determine prospectively whether a low FODMAP diet was beneficial for IBS patients and which factors are associated with a positive outcome.

# Method

Our prospective observational study included 192 IBS patients who were referred in the last three years (2009 - 2011) to a tertiary medical centre in Christchurch New Zealand.

#### Inclusion criteria:

#### 1) Hydrogen/methane breath testing:

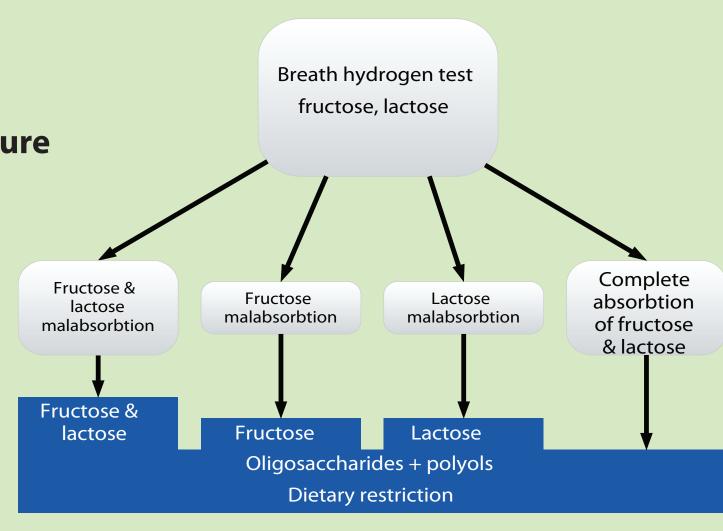
- Lactulose(15ml): positive control and to determine Small Intestinal Bacterial Overgrowth
- Fructose(35g)
- Lactose(50g)

Threshold: >10 ppm on 2 consecutive readings

2) The specialised dietic intervention is described in the figure

#### 3) Patient assessment:

 Symptom questionnaire containing 20 questions about bowel habits on baseline, which where rated by intensity on a seven-point Likert scale.



#### Follow up:

- Symptom questionnaire containing 20 questions about bowel habits, which where rated by intensity on a seven-point Likert scale.
- Questions about adherence, satisfaction with the diet(manageability, taste and price) and the role of specific aspect in the adherence.
- Retrospective assessment of symptom improvement on a seven-point Likert scale, in order to compare with a previous study by Staudacher et al.

## Results

Ninety (46.9%) of 192 patients completed the follow up questionnaire. The characteristics of these patients are shown in the following table. There was a significant improvement at follow-up in almost all of the reported symptoms. (Table 2)

Characteristics	Repliers, n = 90		
Female, n(%)	76 (84.4)		
Age(years), mean (SD)	47.0 (15.3)		
Follow-up time(months), mean (SD)	15.7 (9.0)		
Breath tests n(%)			
Positive Fructose	68 (75.6)		
Positive Lactose	34 (37.8)		
Positive SIBO	12 (13.3)		
Symptoms (Likert scale)	Absent n(%)	Mild n(%)	Severe n(%)
Bloating	15 (16.9)	41 (46.1)	31 (37.1)
Abdominal pain	9 (12.5)	42 (58.3)	21 (29.2)
Passing gas	14 (15.6)	43 (47.8)	33 (36.7)
Diarrhoea	41 (46.6)	31 (35.2)	16 (18.2)
Constipation	37 (41.6)	37 (41.6)	15 (16.9)
Nausea	38 (42.7)	37 (41.6)	14 (15.7)

SIBO = Small Intestine Bacterial Overgrowth

Tak	ole :

		Symptom	improvement n(%)			
Bowel symptom	n	Symptom absent n(%)	No change	1 scale	2 scales or more	p(2-tailed
Abdominal pain	72	9(12.5)	10(15.9)	17(27.0)	28(44.4)	.000
Bloating	89	15(16.9)	15(20.3)	25(33.8)	28(37.8)	.000
Constipation	89	37(41.6)	11(21.2)	14(26.9)	20(38.5)	.003
Diarrhoea	88	41(46.6)	9(19.1)	8(17.0)	28(59.6)	.000
Nausea	89	38(42.7)	8(15.7)	14(27.5)	26(51.0)	.000
Passing gas	90	14(15.6)	20(26.3)	14(18.4)	33(43.4)	.000
Burping	89	41(46.1)	9(18.8)	11(22.9)	14(29.1)	.275
Loose bowel movements	88	30(34.1)	11(19.0)	11(19.0)	31(53.4)	.000
Hard stools	88	46(52.3)	6(14.3)	11(26.2)	22(52.4)	.001
Urgent need for bowel movement	90	30(33.3)	11(18.3)	10(16.7)	34(56.7)	.000
Feeling not completely emptied after bowel movement	90	19(21.1)	17(23.9)	19(26.8)	27(38.0)	.000
<3 bowel movements a week	88	67(76.1)	6(28.6)	5(23.8)	9(42.3)	.015
>3 bowel movements a day	90	43(47.8)	4(8.5)	12(25.5)	28(59.6)	.000
Straining during a bowel movement	87	38(43.7)	8(16.3)	12(24.5)	24(49.0)	.000
Abdominal pain/discomfort relieved by bowel movement	90	16(17.8)	8(10.8)	13(17.6)	43(58.1)	.000
Feeling full shortly after having started a meal	89	39(43.8)	8(16.0)	22(44.0)	17(34.0)	.001
Feeling full even long after you stopped eating	90	46(51.1)	5(11.4)	15(34.1)	16(36.4)	.051
Visible swelling abdomen	89	31(34.8)	13(22.4)	10(17.2)	28(48.3)	.000
Passage of mucus	89	70(78.7)	4(21.1)	1(5.3)	10(52.6)	.890
Indigestion	88	44(50.0)	6(13.6)	19(43.2)	13(29.5)	.015

In order to determine whether the symptoms would remain significant if the whole cohort had replied. We repeated the same analysis including the non-repliers, assuming that none of them had improved with the dietary intervention. All symptoms remained significantly improved.

Patients with fructose malabsorption were significantly more likely to report an improvement in bloating, abdominal pain/discomfort, flatulence/wind, diarrhoea and constipation following dietary intervention than those without breath test evidence of fructose malabsorption. (Table 3)

The majority (75.6%) of the patients were adherent to the diet. (Table 4) And there was a significant positive correlation between adherence and improvement of gastrointestinal symptoms.

Table 3				
Symptom	Improved and FM N(%)	Improved without FM N(%)	OR [95% CI]	p(Fisher exact test)
Bloating	57(67.1)	9(10.6)	8.71 [2.76 - 27.5]	.000
Abdominal pain/discomfort	62(69.7)	14(15.7)	7.09 [2.01 - 25.0]	.002
Flatulence/wind	56(63.6)	8(9.1)	7.64 [2.53 - 23.0]	.000
Diarrhoea	40(54.1)	10(13.5)	3.39 [1.17 - 9.78]	.029

3.78 [1.18 - 12.1] .032

FM = fructose malabsorption, OR = odds ratio, CI = confidence interval

At follow up, most patients (72.1%) were satisfied with their overall symptoms, and 89.5% of the patients thought the written information was easy to understand. Furthermore, 75.9% believed that having a breath test made the diet easier to understand and to adhere to. Also 60% stated that the diet was easy to follow and 65.1% could easily find suitable products.

Adherence	Details	Patients N(%)
	Never followed the diet.	4(4,4)
Non-adherent	Followed the diet as taught for some(up to three months) time, but now do not follow the diet.	13(14,4)
	Followed the diet as taught immediately, but now follow it less than 50% of the time.	5(5,6)
Adherent	Followed the diet as taught atleast 50% of the time.	13(14,4)
	Followed the diet as taught immediately and now follow it at all times except on some occasions.	32(35,6)
	Followed the diet as taught and now follow it at all times except when I'm eating away from home.	12(13,3)
	Followed the diet as taught immediately and still follow the diet totally.	11(12,2)

# Conclusion

#### Low FODMAP diet offers symptom relief.

Constipation

- Almost all symptoms improved significantly
- Also beneficial for related GI symptoms

#### Fructose malabsorption is associated with improvement, when using the low FODMAP diet.

- Breath tests are performed to determine the nature and degree of the dietary restriction
- It provides prognostic information about the chance of success of the dietary intervention
- It may improve adherence to the diet on the long term

Adherence is a crucial factor for efficacy of the dietary change.

## Contact

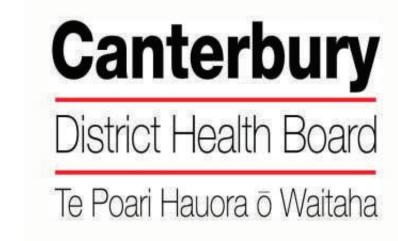
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Improvement n(%)



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