

# Fermentable dietary carbohydrates as triggers of functional gut symptoms in patients with inflammatory bowel disease

<b>Submission date</b> 20/01/2014	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 04/03/2014	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 22/05/2017	<b>Condition category</b> Digestive System	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Inflammatory bowel disease (IBD) is a chronic relapsing remitting disease characterised by inflammation of the gut. Between 35% and 57% of patients with IBD in remission also report a range of gut symptoms similar to those experienced in functional bowel disorders, including irritable bowel syndrome (IBS), such as abdominal pain, bloating and diarrhoea. These symptoms are not associated with underlying inflammation of the disease, but may result in reduced quality of life. There is growing evidence for the use of a diet low in fermentable carbohydrates (the low FODMAP diet) for the management of functional gut symptoms (FGS) in patients with IBS. There is early evidence for the use of this diet in patients with IBD who have FGS during inactive disease; however, there are no studies published in this area. The aim of this study is to find out whether IBD patients are sensitive to individual fermentable dietary carbohydrates (FODMAPs). Patients receive drinks containing common dietary carbohydrates and symptom response is compared with a placebo (dummy) challenge.

### Who can participate?

Male and female adult IBD patients who have experienced a sustained improvement in their symptoms whilst following the low FODMAP diet, recruited from outpatient clinics at Guys and St Thomas NHS Foundation Trust, London, UK.

### What does the study involve?

At an initial visit before the start of the study demographic and disease characteristics and details regarding FGS are collected. Measurements include disease activity scores, bowel habits diary, diet history, and stool and blood markers of inflammation. Participants continue on the low FODMAP diet throughout the study. Participants are then randomly allocated to a sequence of four carbohydrate test drinks. Participants take one measure of powdered carbohydrate mixed into water with breakfast or in the morning within a specified time frame. The drinks are consumed once daily for three days and a daily gut symptom and stool diary is kept to monitor symptoms. In addition, a daily adherence diary is kept. After the three test days participants are instructed on following a four-day washout phase in which they continue the diet with no test drinks. This phase is to ensure that symptoms have returned to as they were before the start of

the intervention before starting the next test. This is repeated for each of the four test drinks. Once a participant has completed all four tests, they attend a final visit for an end of study blood and stool sample to recheck inflammation. Any adverse events are also recorded.

What are the possible benefits and risks of participating?

The main benefit of participating in the study is that patients learn which carbohydrates they are most sensitive to, enabling appropriate dietary changes to be made to help them manage their symptoms effectively. The low FODMAP diet is well tolerated, is not known to have any negative effects and is routinely used in clinical practice. Risk to patient safety is not expected. The main burden to participants is continuing a strict low FODMAP diet for the duration of the study, completing gut symptom and stool diaries, providing two blood and stool samples, and consuming the test drinks. The test drinks may induce symptoms that cause abdominal discomfort and/or a change in bowel habit, but the quantities of carbohydrates used in the test drinks are similar to those consumed in their previous normal diet and symptoms are not expected to be greater than those experienced by patients before starting the diet. There are no safety concerns of consuming these dietary carbohydrates. Taking blood samples is a routine procedure used frequently in clinical practice. Participants may experience mild pain or discomfort during the procedure and may notice a small bruise or mild soreness for a few days afterwards. The procedure is performed by an experienced and trained phlebotomist.

Where is the study run from?

King's College London and Guys and St Thomas NHS Foundation Trust gastroenterology outpatient clinics (UK).

When is the study starting and how long is it expected to run for?

March 2014 to January 2017

Who is funding the study?

King's College London (UK)

Who is the main contact?

1. Prof. Kevin Whelan
2. Dr Peter Irving  
Peter.Irving@gstt.nhs.uk
3. Alexis Prince  
alexis.prince@kcl.ac.uk

## Contact information

### Type(s)

Scientific

### Contact name

Prof Kevin Whelan

### Contact details

King's College London, School of Medicine  
Diabetes and Nutritional Sciences Division  
4.06 Franklin Wilkins Building  
150 Stamford Street  
London

United Kingdom  
SE1 9NH

## Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers  
N/A

## Study information

### Scientific Title

Fermentable dietary carbohydrates as triggers of functional gut symptoms in patients with inflammatory bowel disease: a randomised controlled crossover trial

### Study objectives

It is hypothesised that, in patients with inactive inflammatory bowel disease who have reported an improvement in functional gut symptoms (FGS) following a low fermentable carbohydrate diet, rechallenge with individual fermentable dietary carbohydrates (FODMAPs) will induce FGS compared with a placebo, glucose.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

NRES Committee London - Camberwell St Giles, 16/01/2014, ref: 13/LO/1878

### Study design

Double-blinded placebo-controlled crossover rechallenge trial

### Primary study design

Interventional

### Secondary study design

Randomised cross over trial

### Study setting(s)

Hospital

### Study type(s)

Treatment

### Participant information sheet

See additional files

## **Health condition(s) or problem(s) studied**

Inflammatory bowel disease (Crohn's disease and ulcerative colitis)

## **Interventions**

Interventions as of 06/02/2017:

Eligible participants are allocated to undergo four dietary carbohydrate Fermentable Oligo-Di-Monosaccharides and Polyols (FODMAP) challenges in a random order. Each challenge lasts for 3 days, followed by at least 4 days washout. Participants record gastrointestinal symptoms and stool frequency and consistency during each challenge and on the final day of the washout period. Participants and researchers are blinded to the order of challenges. An online random number generator is used to produce the randomisation sequences.

1. Test: Fermentable carbohydrate drink containing 12 grams of fructans
2. Test: Fermentable carbohydrate drink containing 6 grams of galactooligosaccharides
3. Test: Fermentable carbohydrate drink containing 6 grams of sorbitol
4. Control: Fermentable carbohydrate drink containing 12 grams of glucose

Interventions as of 23/04/2014:

Each participant will complete all four dietary carbohydrate Fermentable Oligo-Di-Monosaccharides and Polyols (FODMAP) challenges in a random order:

1. Test: Fermentable carbohydrate drink containing 12 grams of fructans
2. Test: Fermentable carbohydrate drink containing 6 grams of galactooligosaccharides
3. Test: Fermentable carbohydrate drink containing 6 grams of sorbitol
4. Control: Fermentable carbohydrate drink containing 12 grams of glucose

Original interventions:

Each participant will complete all four dietary carbohydrate Fermentable Oligo-Di-Monosaccharides and Polyols (FODMAP) challenges in a random order:

1. Test: Fermentable carbohydrate drink containing 12 grams of fructans
2. Test: Fermentable carbohydrate drink containing 6 grams of galactooligosaccharides
3. Test: Fermentable carbohydrate drink containing 2 grams of sorbitol
4. Control: Fermentable carbohydrate drink containing 12 grams of glucose

## **Intervention Type**

Other

## **Phase**

Not Applicable

## **Primary outcome measure**

To find out whether FGS are adequately controlled following rechallenge with individual FODMAPs compared with a placebo, glucose. This will be measured by a Global Symptom Question Do you currently have satisfactory relief of your gut symptoms? with a 'yes' or 'no' response. This will be measured at baseline, for 3 days during each test and on day 4 of the washout phase to ensure symptoms have returned to baseline.

## **Secondary outcome measures**

1. Ratings and mean scores for individual symptoms during each test phase, measured by the Gastrointestinal Symptom Rating Scale at baseline, for 3 days during each test and on day 4 of

the washout phase.

2. Faecal calprotectin and serum CRP levels, measures of inflammation, measured at baseline and at the end of the trial

**Overall study start date**

01/03/2014

**Completion date**

27/01/2017

## **Eligibility**

**Key inclusion criteria**

1. Men and women aged 18 years or over
2. Individuals able to give informed consent
3. Diagnosis of IBD confirmed by standard clinical, histological and radiological criteria
4. Diagnosis of IBD for duration of at least 6 months. IBD in remission as defined by physician global assessment, patient report and two markers of absence of inflammation: C-reactive protein (CRP) <10mg/l and faecal calprotectin <250µg/g.
5. Stable medications (see exclusion criteria), no recent surgery (see exclusion criteria) and stable symptoms for at least 2 months
6. Diagnosis of functional bowel disorder as defined by Rome III criteria (IBS or functional bloating or functional diarrhoea or functional abdominal pain syndrome) with marked and sustained improvement of these symptoms on the low fermentable carbohydrate diet
7. A willingness to participate

**Participant type(s)**

Patient

**Age group**

Adult

**Lower age limit**

18 Years

**Sex**

Both

**Target number of participants**

32

**Key exclusion criteria**

1. Patients with active IBD
2. Recent use of the following treatments: antibiotics or prebiotics in the preceding 4 weeks, non steroidal anti-inflammatory drugs (NSAIDs) during the preceding week.
3. Currently taking steroids
4. Recent changes in dose to the following treatments: azathioprine, 6-mercaptopurine, methotrexate or alpha tumor necrosis factor (alpha-TNF) agents during the preceding 12 weeks, oral 5-aminosalicylic acid (5-ASA) or steroids during the preceding 4 weeks
5. Previous panproctocolectomy, pure perianal disease or short bowel syndrome

6. Stenotic disease
7. Sepsis or fever
8. Diabetes or coeliac disease (by serology and/or duodenal biopsy)
9. Other concomitant serious comorbidity e.g. significant hepatic, renal, endocrine, respiratory, neurological or cardiovascular disease
10. Pregnancy or lactation
11. Taking any medications with the potential to influence gastrointestinal symptoms unless taking a long term stable dose that is unlikely to change or stop during the trial

**Date of first enrolment**

14/04/2014

**Date of final enrolment**

16/09/2015

## **Locations**

**Countries of recruitment**

England

United Kingdom

**Study participating centre**

**Guy's and St Thomas' NHS Foundation Trust**

Great Maze Pond

London

United Kingdom

SE1 9RT

**Study participating centre**

**Barts Health NHS Trust**

The Royal London Hospital

Whitechapel road

Whitechapel

London

United Kingdom

E1 1BB

## **Sponsor information**

**Organisation**

King's College London (UK)

**Sponsor details**

c/o Mr Keith Brennan  
Room 1.8 Hodgkin Building  
Guy's Campus  
London  
England  
United Kingdom  
SE1 1UL

**Sponsor type**

University/education

**ROR**

<https://ror.org/0220mzb33>

## **Funder(s)**

**Funder type**

University/education

**Funder Name**

King's College London

**Alternative Name(s)**

Collegium Regale Londiniense, King's, KCL

**Funding Body Type**

Government organisation

**Funding Body Subtype**

Universities (academic only)

**Location**

United Kingdom

## **Results and Publications**

**Publication and dissemination plan**

Planned publication in a peer reviewed journal.

**Intention to publish date**

31/12/2017

**Individual participant data (IPD) sharing plan**

The current data sharing plans for the current study are unknown and will be made available at a later date.

## IPD sharing plan summary

Data sharing statement to be made available at a later date

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Participant information sheet</a>	version V3	24/02/2015	06/02/2017	No	Yes
<a href="#">Results article</a>	results	04/12/2017		Yes	No
<a href="#">HRA research summary</a>			28/06/2023	No	No