

The effect of sodium butyrate on abdominal symptoms and carbohydrate metabolism in patients with type 2 diabetes

Submission date 08/01/2025	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
Registration date 31/01/2025	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
Last Edited 21/01/2025	Condition category Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

This study aims to determine whether sodium butyrate supplementation affects carbohydrate metabolism and the severity of abdominal symptoms in patients diagnosed with type 2 diabetes.

Who can participate?

Eligible participants include type 2 diabetes patients who report gastrointestinal symptoms (meeting the Rome V criteria for the diagnosis of irritable bowel syndrome), such as abdominal pain, bloating, diarrhea, or constipation.

What does the study involve?

Participants will be divided into two groups: one group will receive 1.5 g of sodium butyrate daily, while the other group will receive a placebo. During the first visit and the second visit, 12 weeks later, blood samples will be collected to measure glucose, insulin, and glycated hemoglobin levels, and a hydrogen breath test will be performed to assess for SIBO.

What are the possible benefits and risks of participating?

Potential benefits of the study include alleviation of irritable bowel syndrome symptoms and improved carbohydrate metabolism control. To date, no side effects of sodium butyrate use have been reported.

Where is the study run from?

The study is being conducted at the Clinic of Gastroenterology and Internal Medicine, National Medical Institute, Ministry of Internal Affairs and Administration (PIM MSWiA), Poland

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

January 2021 to August 2023

Who is funding the study?

1. The Clinic of Gastroenterology and Internal Medicine, National Medical Institute, Ministry of Internal Affairs and Administration (PIM MSWiA), Poland
2. Sodium butyrate and placebo will be provided by the manufacturer, Bioton, Poland

Who is the main contact?

Paulina Panufnik, paulina.panufnik@cskmswia.gov.pl

Contact information

Type(s)

Public, Scientific, Principal investigator

Contact name

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Additional identifiers

Clinical Trials Information System (CTIS)

Nil known

ClinicalTrials.gov (NCT)

Nil known

Protocol serial number

Nil known

Study information

Scientific Title

The effect of microencapsulated sodium butyrate on abdominal symptoms and carbohydrate metabolism in patients with type 2 diabetes: a randomized placebo-controlled trial

Study objectives

Sodium butyrate supplementation reduces the severity of gastrointestinal symptoms and improves carbohydrate metabolism.

Ethics approval required

Ethics approval required

Ethics approval(s)

approved 21/04/2021, The Bioethics Committee of the National Medical Institute of the Ministry of Internal Affairs and Administration (Woloska 137, Warsaw, 02-507, Poland; +48477221552; komisja.etyki@cskmswia.gov.pl), ref: 55/2021

Study design

Single-centre interventional double-blinded, placebo-controlled trial

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Treatment of gastrointestinal symptoms and improvement of carbohydrate metabolism in patients with type 2 diabetes.

Interventions

The study will include patients with type 2 diabetes who meet the Rome IV criteria for the diagnosis of irritable bowel syndrome (IBS). Participants will be randomized, using an application, into two groups: one receiving 1.5 g of sodium butyrate daily for 12 weeks and the other receiving a placebo. During two visits, at weeks 0 and 12, patients will undergo laboratory tests, a lactulose hydrogen breath test to diagnose SIBO, and will complete a questionnaire assessing the severity of gastrointestinal symptoms.

Intervention Type

Supplement

Primary outcome(s)

1. Changes in carbohydrate metabolism will be measured by assessing glycated hemoglobin (HbA1c) levels and calculating the HOMA-IR index at the start of the study and after the 12-week intervention.
2. Changes in the severity of gastrointestinal symptoms will be evaluated using a gastrointestinal symptom severity questionnaire, completed by participants at the start of the study and after the 12-week intervention.

Key secondary outcome(s)

1. The presence of small intestinal bacterial overgrowth (SIBO) in patients will be assessed through a hydrogen breath test conducted at the start of the study and after the 12-week intervention
2. Fasting insulin levels in the blood of participants were measured using venous blood samples at the beginning of the study and after the 12-week intervention
3. Fasting glucose levels in the blood of participants were measured using venous blood samples at the beginning of the study and after the 12-week intervention

Completion date

03/08/2023

Eligibility

Key inclusion criteria

1. Age: 18–80 years.
2. Diagnosed type 2 diabetes with no modifications to treatment for at least 3 months.
3. Meeting the Rome IV criteria for the diagnosis of irritable bowel syndrome (IBS).

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Mixed

Lower age limit

18 years

Upper age limit

80 years

Sex

All

Total final enrolment

52

Key exclusion criteria

1. Age > 80 years or <18
2. Any changes in treatment within 3 months before qualification and/or during the study
3. Dietary interventions 4 weeks before qualification and/or during the study
4. Use of antibiotics 4 weeks before qualification and/or during the study
5. Use of prokinetics, antidiarrheal drugs, probiotics, sodium butyrate, proton pump inhibitors or H2 receptor blockers 14 days before qualification and/or during the study
6. Pregnancy or breastfeeding
7. Lactulose intolerance
8. Diagnosis of galactosemia

Date of first enrolment

01/10/2022

Date of final enrolment

01/07/2023

Locations

Countries of recruitment

Poland

Study participating centre

Clinic of Gastroenterology and Internal Medicine, National Medical Institute, Ministry of Internal Affairs and Administration

Woloska 137 st.

Warsaw

Poland

02-507

Sponsor information

Organisation

Ministry of Interior and Administration

ROR

<https://ror.org/03c86nx70>

Funder(s)

Funder type

Hospital/treatment centre

Funder Name

Clinic of Gastroenterology and Internal Medicine, National Medical Institute, Ministry of Interior and Administration

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study will be available upon request from Paulina Panufnik (paulina.panufnik@cskmswia.gov.pl)

1. The type of data that will be shared: The study results and patient data, such as age, type of treatment, and anonymized information, will be shared.
2. Timing for availability: The data is already available.
3. Whether consent from participants was required and obtained: Consent was required and obtained.
4. Comments on data anonymization: The data has been anonymized.
5. Any ethical or legal restrictions: Approval from the bioethics committee has been obtained

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes