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A trial looking at the effectiveness of a treatment made from donated stool samples to see if gut bacteria can be increased in patients having a transplant for blood cancer.

Submission date
04/05/2023

Recruitment status
No longer recruiting

Registration date
09/10/2023

Overall study status
Ongoing

Last Edited
05/11/2025

Condition category
Cancer

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
There are thousands of bacteria and other microbes that live in the intestines (also referred to as the gut microbiota) that play an important role in keeping the body healthy, examples of this include supporting the immune system, digestion and the uptake of nutrients. Past research has shown that a lower number of microbes present in the gut can reduce its supportive role in the body and as a result cause immune and gut-related complications.

Intestinal microbiota transplantation (IMT) has been established as an effective treatment for recurrent Clostridioides difficile infection (rCDI) due to its ability to restore the number and diversity of gut microbes to a healthy level reducing the chance of reoccurrence. Patients with blood cancers are more prone to having weaker immune systems from anti-cancer treatments such as chemotherapy. A lower immune system also increases the risk of patients developing an infection which will require antibiotic treatment. Patients with blood cancers also receive many courses of antibiotics for bacterial infections. Antibiotics reduce the number of gut microbes present and previous research has shown a link between reduced gut microbiota and poorer survival outcomes in patients receiving stem cell transplants. Therefore, the aim of the MAST study is to investigate the ability to restore gut microbiota to healthier levels and to assess the clinical outcomes in patients with blood cancers scheduled to have stem cell transplants.

Who can participate?
Adult patients with blood cancer

What does the study involve?
Up to 50 eligible patients will be recruited for the study from 6 participating UK hospitals. Participants will be randomised to 1 of the 2 treatment groups to receive either IMT by capsule (group 1) or placebo (group 2). Participants will be followed up for 24 months.

Patients will be asked to report side effects in a patient diary for 7 days after receiving treatment and be given a contact number for the study doctor or nurse to call for support or guidance. Each day there will be 7 yes/no tick questions for patients to answer to maintain simplicity and to keep the completion time short. The purpose of the patient diary is to help patients monitor any potential side effects and for the investigators to collect clinical data on the IMP's safety and tolerability.

Patients will attend 11 visits for the study. The patients will be inpatients at their local hospital 28 days prior to stem cell transplant which will account for 4 of the study visits. To reduce the remaining burden other visits will coincide with those of standard care and patients who attend study visits will be eligible to claim compensation for travel expenses.

Blood, urine and stool samples will be collected for 10 of the study visits. The amount of blood collected will be kept to a minimum at each visit i.e. equivalent to a teaspoon (5ml). Blood collected for research will be analysed in St Mary's Hospital to gather metabolic data. For stool samples, patients will be given the option of providing these within 24 hours of a study visit via the use of relevant sample collection materials and a travel bag for transportation.

Patients will complete a quality of life questionnaire at 4 of the 11 study visits, with the possibility that some of the questions may cause discomfort or distress and this will be offset by support from appropriately trained staff delegated to perform study activities at local sites. All questionnaires for the study, including the dietary questionnaire, can be completed at the study visit and therefore should not create an additional time burden for patients outside the local site setting.

What are the possible benefits and risks of participating?
Patients may experience mild gastrointestinal side effects that should resolve within 1-2 days. These include nausea, abdominal cramping, bloating, constipation or diarrhoea and should not be significant.

Although unlikely there is also a risk of transmission of infection from donor to recipient. To minimise the risk of infection the drug manufacturer follows a robust extensive screening procedure when selecting donors. In the unlikely event of infection, patients will be treated according to local standard procedures of participating NHS sites.

Where is the study run from?
Hammersmith Hospital (UK)

When is the study starting and how long is it expected to run for?
May 2023 to August 2026

Who is funding the study?
Medical Research Council (UK)

Who is the main contact?
Study team, mast-trial@imperial.ac.uk

https://www.cancerresearchuk.org/about-cancer/find-a-clinical-trial/a-study-looking-at-an-intestinal-microbiota-transplant-before-a-donor-stem-cell-transplant-for-blood-cancer-mast

Contact information

Type(s)
Scientific

Contact name
Prof Julian Marchesi

Contact details
Imperial College London
10th Floor, Queen Elizabeth the Queen Mother Wing (QEQM)
St Mary's Campus
London
United Kingdom
W2 1NY
+44 (0)20 3312 6197
j.marchesi@imperial.ac.uk

Type(s)
Principal investigator

Contact name
Dr Jiri Pavlu

Contact details
Hammersmith Hospital Campus
Du Cane Road
London
United Kingdom
W12 0NN
+44 (0)20 3313 8117
jiri.pavlu@imperial.ac.uk

Type(s)
Public

Contact name
Dr MAST Trial

Contact details
-
-
United Kingdom
-
None available
mast-trial@imperial.ac.uk

Additional identifiers

Clinical Trials Information System (CTIS)
2022-003617-10

Integrated Research Application System (IRAS)
1006971

ClinicalTrials.gov (NCT)
NCT06355583

Protocol serial number
22/HH/7541, C/42/2022, IRAS 1006971, CPMS 55483

Study information

Scientific Title
Intestinal Microbiota Transplant Prior to Allogeneic Stem Cell Transplant (MAST) trial

Acronym
MAST

Study objectives
The aim of the MAST study is to investigate the ability to restore gut microbiota to healthier levels and to assess the clinical outcomes in patients with blood cancers scheduled to have stem cell transplant

The study also aims to investigate,
Tolerability and acceptability of intestinal microbiota transplantation (IMT) versus placebo (as assessed via patient perspective questionnaires).
Changes in gut microbiome diversity across all timepoints
Markers of general health, infective/microbiological and haematological outcomes including days of fever, admission to intensive care unit, survival, non-relapsed mortality, and incidence of graft-versus-host disease across all time points measured.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 03/10/2023, North East – Tyne & Wear South (HRA Centre Manchester, 3 Piccadilly Place, London Road, Manchester , M1 3BN, United Kingdom; +44 (0)207 104 8282; tyneandwearsouth.rec@hra.nhs.uk), ref: 23/NE/0105

Study design
Randomized placebo-controlled double-blind study

Primary study design
Interventional

Study type(s)
Efficacy, Safety, Treatment

Health condition(s) or problem(s) studied
The study population will include patients with, acute myeloid leukaemia (AML), acute lymphoblastic leukaemia (ALL), acute leukaemia (AL) of ambiguous lineage, chronic lymphocytic

leukaemia (CLL), Chronic myeloid leukaemia (CML), chronic myelomonocytic leukaemia (CMML), myelodysplastic syndrome (MDS)

Interventions
The trial will have two arms, Placebo and Treatment (capsule intestinal microbiota transplant; IMT). Patients will be randomised (1:1) by the database software. The intervention provider will follow their local standard procedures of administering the capsules orally to patients. The intervention will be delivered orally and supervised by a trained staff member at the patients' scheduled hospital visit. The multi-centre study will occur at six NHS Trust Hospitals across the UK.

Arm 1: Placebo Dose: No active ingredients, Route of administration: Oral, Duration of treatment: up to 45 minutes, Follow up: 9 months
Arm 2: Capsule IMT Dose: 10 x (1x108CFU/g of viable microorganisms per capsule), Route of administration: Oral, Duration of treatment: up to 45 minutes, Follow up: 9 months

The difference in alpha diversity will be obtained by stool microbiome analysis, and DNA will be extracted from faecal samples. Next, generation microbial sequencing (shallow shotgun sequencing) will be performed with samples collected at 2 study timepoints (screening and day 28 post stem cell transplant).

Intervention Type
Biological/Vaccine

Phase
Phase II

Drug/device/biological/vaccine name(s)
Intestinal microbiota transplantation

Primary outcome(s)
The change in alpha diversity in patients receiving capsulised intestinal microbiota transplantation (IMT) versus placebo measured using next, generation microbial sequencing (shallow shotgun sequencing) of DNA extracted from faecal samples and assessed by the difference between the change in alpha diversity (calculated using inverse Simpson index) 28 +/- 3 days post-HCT from baseline for patients in Capsulised Placebo group versus Capsulised IMT group

Key secondary outcome(s))
1. Tolerability and acceptability of IMT versus placebo assessed through the Functional Assessment of Cancer Therapy measured using the health-related quality of life (EQ-5D-5L) and EORTC patient perspective questionnaires at Day 28(+/-3), 100(+/-7), 200(+/-7) and 365(+/-14)
2. Gut microbiome endpoints: Assessment of changes in inverse Simpson’s index and other measures of gut microbiome diversity, changes in taxonomic composition (using shallow shotgun sequencing), alpha diversity and richness (measured via Chao-1, Shannon, Faith’s PD), and beta diversity (Aitchinson’s distance) across all timepoints assessed, Day 14(+/-2), -7(+/-2), 0 (+/-1), 7(+/-3), 14(+/-3), 28(+/-3), 100(+/-7), 200(+/-7) and 365(+/-14)
3. Clinical endpoints: Markers of general health, infective/microbiological and haematological outcomes including days of fever, admission to intensive care unit, survival, non-relapsed mortality, and incidence of graft-versus-host disease measured using patient medical notes across all time points assessed, Day 14(+/-2), -7(+/-2), 0(+/-1), 7(+/-3), 14(+/-3), 28(+/-3), 100(+/-7),

200
(+/-7) and 365(+/-14).

Completion date
31/08/2026

Eligibility

Key inclusion criteria
1. Patients aged 18 years and over with a morphological documented diagnosis of ALL, AML, AL of ambiguous linage, MDS, CMML, and CML in blast phase who are deemed fit for allogenic HSCT with one of the following disease characteristics:
ALL, AML, AL of ambiguous linage
1.1. Patients in first complete remission (CR1) or second complete remission (CR2) including complete remission with incomplete blood count recovery with < 5% blasts
1.2. Secondary leukaemia (defined as previous history of MDS, antecedent haematological disease or chemotherapy exposure) in CR1 or CR2 defined as < 5% blasts
MDS and CMML
1.3. Patients with advanced or high-risk MDS with an IPSS-M moderate high or higher including intermediate or high-risk CMML who have < 5% blasts at the time of randomisation
CML in the blast phase
1.4. Patients with Philadelphia or BCR:ABL1 positive chronic myeloid leukaemia (CML) in blast phase defined by the presence of ≥ 20% blasts in the blood or bone marrow who have achieved second chronic phase with < 5% blasts (Appendix 2).
2. Patients must have completed a minimum of two cycles of intensive chemotherapy prior to trial enrolment (Appendix 1)
3. Patients must have received broad-spectrum antibiotics within 3 months prior to trial enrolment
4. Patients must be considered suitable/fit to undergo allogeneic HSCT as clinically judged by the Local investigator
5. Patients with a Karnofsky performance status score of 60 or above (Appendix 3)
6. Females and male patients of reproductive potential (i.e., not post-menopausal or surgically sterilised) must use appropriate, highly effective, contraception from the point of commencing therapy until 6 months after treatment
7. Patients have given written informed consent
8. Patients willing and able to comply with scheduled study visits and laboratory tests

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 years

Sex
All

Key exclusion criteria
1. Patients with contraindications to receiving allogeneic HSCT
2. Female patients who are pregnant or breastfeeding. All women of childbearing potential must have a negative pregnancy test before commencing treatment
3. Adults of reproductive potential not willing to use appropriate, highly effective, contraception during the specified period
4. Patients with renal or hepatic impairment as clinically judged by the Local Investigator
5. Patients with active infection, HIV-positive or chronic active HBV or HCV.
6. Patients with a concurrent active malignancy or a prior malignancy, except lobular breast carcinoma in situ, fully resected basal cell or squamous cell carcinoma of the skin or treated cervical carcinoma in situ, an incidental histologic finding of prostate cancer (T1a or T1b using the tumour, node, metastasis (TNM) clinical staging system), previous MDS, CMML, MPN resulting in secondary AML. Cancer treated with curative intent ≥ 5 years previously will be allowed. Cancer treated with curative intent < 5 years previously will not be allowed
7. Swallowing difficulties that may preclude the safe use of IMT capsules
8. Administration of IMT within 3 months prior to enrolment (probiotic administration prior to enrolment is allowed but should be recorded at screening).
9. Patients taking probiotics after enrolment in the trial
10. Chronic intestinal disease, including coeliac disease, cystic fibrosis, inflammatory bowel disease, irritable bowel syndrome, and chronic diarrhoea
11. Known severe allergy to capsule components

Date of first enrolment
15/11/2023

Date of final enrolment
28/11/2025

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Hammersmith Hospital
Du Cane Road
Hammersmith
London
United Kingdom
W12 0HS

Study participating centre
The Royal Marsden Hospital
Fulham Road

London
United Kingdom
SW3 6JJ

Study participating centre
University College London Hospital
250 Euston Road
London
United Kingdom
NW1 2PG

Study participating centre
St. James's University Hospital
Beckett Street
Leeds
United Kingdom
LS9 7TF

Study participating centre
University Hospitals Birmingham
Queen Elizabeth Hospital
Mindelsohn Way
Edgbaston
Birmingham
United Kingdom
B15 2GW

Study participating centre
Kings College Hospital
Haematology Research Unit, 3rd Floor Bessemer Wing
Denmark Hill
London
United Kingdom
SE5 9RS

Study participating centre
Manchester University NHS Foundation Trust
North Road
Manchester
United Kingdom
M13 9WL

Sponsor information

Organisation
Imperial College London

ROR
https://ror.org/041kmwe10

Funder(s)

Funder type
Research council

Funder Name
Medical Research Council

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, Medical Research Committee and Advisory Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study will be published as a supplement to the results publication

IPD sharing plan summary
Published as a supplement to the results publication

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Study website	Study website	11/11/2025	11/11/2025	No	Yes