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The effect of supplementation with an amino acid that helps the body build protein (L-arginine) on change in the immune system of colorectal cancer patients

Submission date
31/03/2021

Recruitment status
No longer recruiting

Registration date
19/04/2021

Overall study status
Completed

Last Edited
26/09/2022

Condition category
Cancer

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Colorectal cancer is cancer that occurs in the colon or rectum. Sometimes it is called colon cancer, for short. As the drawing shows, the colon is the large intestine or large bowel. The rectum is the passageway that connects the colon to the anus.
L-arginine (L-arg) is an amino acid that helps the body build protein. Your body usually makes all the L-arginine it needs. L-arginine is also found in most protein-rich foods, including fish, red meat, poultry, soy, whole grains, beans and dairy products.
L-arg supplementation may improve treatment outcomes from tumours by altering the activity of the immune system.

Who can participate?
Adult patients with diagnosed colorectal cancer qualified to undergo radical surgical treatment

What does the study involve?
Participants will be randomly allocated to receive either L-arg or placebo for 9 days prior to surgery.

What are the possible benefits and risks of participating?
Benefits: Currently, there is insufficient evidence and long-term follow-up to conclusively conclude that L-arginine supplementation improves the outcome treatment in colorectal cancer patients. The aim of our study is to explore this possibility. Thus, an improvement in their health cannot be guaranteed. However, the participation of patients in the study and its results may in the future contribute to improving the results of oncological treatment of other colorectal cancer patients.
Risks: Very rarely, abdominal pain, nausea or diarrhoea may occur after high doses of L-arginine exceeding 30 g per day. These symptoms disappear after withdrawal L-arginine or reducing its doses. We plan to supplement with 10 g of L-arginine daily.

Where is the study run from?
Medical University of Gdańsk, MUG (Poland)

When is the study starting and how long is it expected to run for?
October 2017 to June 2020

Who is funding the study?
Medical University of Gdańsk, MUG (Poland)

Who is the main contact?
Dr Jarosław Szefel, jaszefel@mp.pl
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Contact information

Type(s)
Scientific

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Public

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Additional identifiers

Protocol serial number
NKBBN/405/2017

Study information

Scientific Title
The effect of L-arginine supplementation and surgical trauma on the frequency myeloid-derived suppressor cells and T lymphocytes in tumour and blood of colorectal cancer patients.

Acronym
L-ArgRectCanc

Study objectives
L-arginine (L-arg) supplementation improves treatment outcomes for non-auxotrophic tumours by altering the activity of the immune system.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 09/10/2017, Independent Bioethics Committee for Scientific Research at Medical University of Gdańsk (Dębinki 7, 80-211, Gdańsk, Poland; +48 58 349 10 11; irmez@gumed.edu.pl), ref: NKBBN/405/2017

Study design
Single-centre prospective interventional randomized double-blind study

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
The effect of L-arg supplementation in patients undergoing surgery for colorectal cancer

Interventions
L-arginine and placebo kits are prepared and labelled with numbers randomly assigned by LLC Ethifarm (Poznan, Poland). Each kit contains 180 capsules of 0.5 g of substance. Patients are instructed to take 20 capsules (5 capsules 4 times a day) for 9 days immediately prior to surgery. Researchers and patients does not know what is inside the capsules, and this information is disclosed by LLC Ethifarm after the end of the study.

Randomisation: L-arginine and placebo kits were prepared and labelled with numbers randomly assigned by LLC Ethifarm (Poznan, Poland). Information on the content of the kits was disclosed by LLC Ethifarm to our research team at the end of the trial.

Intervention Type
Supplement

Primary outcome(s)
Measured :
1. L-arg and ASS1 concentration, and ASS1 mRNA expression in tumour, intestinal mucosa, and blood measured using flow cytometry, quantitive PCR and ELISA
2. The frequency of M-MDSC and PMN-MDSC in tumour, intestinal mucosa (A2, B2), and blood measured using flow cytometry

Key secondary outcome(s))
Blood parameters measured using flow cytometry and ELISA before supplementation; one day after the end of supplementation - immediately before the surgery; and one day after the surgery:
1. ASS1 concentration
2. The frequency of Th1 cells
3. The frequency of Th2 cells
4. The Th1/Th2 ratio
5. The frequency of Treg cells
6. The frequency of Th17
7. Th17/Treg ratio
8. CRP concentrations and its relation to the frequency of PMN-MDSC, M-MDSC and Th1, Th2
9. The frequency of PMN-MDSC in blood
10. The frequency of M-MDSC in blood

Completion date
21/06/2020

Eligibility

Key inclusion criteria
Adult patients with diagnosed colorectal cancer qualified to undergo radical surgical treatment

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
65

Key exclusion criteria
1. Chemotherapy and/or radiotherapy in the last 5 years
2. Autoimmune diseases

3. Liver or kidney failure
4. Uncontrolled diabetes
5. Acute and chronic inflammatory diseases

Date of first enrolment
30/04/2018

Date of final enrolment
30/04/2020

Locations

Countries of recruitment
Poland

Study participating centre
Maritime Polish Red Cross Memorial Hospital
Department of Surgical Oncology
Gdynia Oncology Centre
1 Powstania Styczniowego Street
Gdynia
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Study participating centre
Medical University of Gdansk
Division of Oncological Propedeutics
Faculty of Health Sciences
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Study participating centre
Medical University of Gdansk
Department of Clinical Nutrition
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Study participating centre
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Study participating centre
WSB University in Gdansk
Faculty of Finance and Management
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Sponsor information

Organisation
Gdańsk Medical University

ROR
https://ror.org/019sbgd69

Funder(s)

Funder type
University/education

Funder Name
Gdański Uniwersytet Medyczny

Alternative Name(s)
Medical University of Gdańsk, MUG

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
Poland

Results and Publications

Individual participant data (IPD) sharing plan

All data generated or analysed during this study will be included in the subsequent results publication.

IPD sharing plan summary

Other

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		04/01/2022	12/01/2022	Yes	No
Participant information sheet			04/05/2021	No	Yes