ISRCTN12833814 https://doi.org/10.1186/ISRCTN12833814

Bergamot and Cardoon extract for liver disease

Submission date	Recruitment status	[_] Prospectively registered
05/08/2019	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
07/08/2019	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
06/09/2023	Digestive System	

Plain English summary of protocol

Background and study aims
Non-alcoholic fatty liver disease is the most common cause of liver-related morbidity and mortality in the world. However, no effective drug treatment for this condition has been found. Oxidative stress is one of the key mediators of liver damage and represents a major contributor to the progression from simple steatosis to cirrhosis. It has been demonstrated that Bergamot (Citrus bergamia Risso et Poiteau) flavonoids decrease liver inflammation. Wild cardoon (Cynara cardunculus L.), is rich in antioxidant compounds which possess anti-inflammatory properties. The aim of this study is to test the effect of a new nutraceutical containing natural bioactive components from Bergamot and wild Cardoon, with antioxidant proprieties, as a treatment for patients with liver steatosis.

Who can participate?
Patients aged 30 and over with liver steatosis

What does the study involve?
Participants are randomly allocated to the intervention group or the control group. The intervention group receive Bergacyn®, containing a Bergamot polyphenol fraction and Cynara Cardunculus extract, for 12weeks. The control group receive a placebo (dummy pill) daily for 12 weeks. Liver fat content is measured at the start and the end of the study.

What are the possible benefits and risks of participating?
All participants receive a liver disease screening for free. No risks are expected.

Where is the study run from?
University Magna Grecia (Italy)

When is the study starting and how long is it expected to run for?
June 2018 to September 2019

Who is funding the study?
Ministry of Education, Universities and Research (Italy)

Who is the main contact?
1. Prof. Arturo Pujia

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2. Prof. Vincenzo Mollace
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Contact information

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Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
219/2018/CE

Study information

Scientific Title
Effects of Bergamot (Citrus bergamia Risso et Poiteau) and wild cardoon (Cynara cardunculus L.) extract intake on non-alcoholic fatty liver disease (NAFLD)

Study objectives
Given the key roles of oxidation and inflammation in the pathogenesis of liver steatosis and the promising role for natural antioxidants, in this study the aim was to test the effect of a new nutraceutical containing Bergamot and wild Cardoon extract.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 24/09/2018, local ethical committee at the “Mater Domini” Azienda University Hospital (viale T. Campanella, Catanzaro, Italy; Tel: +39 (0)961 712 111; Email: comitatoetico@hotmail.it; michelangelo.rossano@regione.calabria.it), ref: 219/2018/CE

Study design
Double-blind placebo-controlled randomized clinical trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Liver steatosis

Interventions
Participants are randomized by simple randomization to:
1. Bergacyn® (provided by Herbal & Antioxidant SRL, Bianco, RC, Italy): one softgel pill containing 300 mg of a combination product containing bergamot polyphenolic fraction (BPF®), and wild type Cynara Cardunculus extract plus excipients including PUFA 380 mg and a mixture of bergamot pulp and albedo derivative]. (registered Patents RM2008A000615, PCT/IB2009 /055061 and 102017000040866)
2. Placebo: one softgel pill containing maltodextrin 300 mg plus excipients including PUFA 380 mg

Both groups receive the intervention for 12 weeks. Liver fat content, measured by transient elastography (Fibroscan), serum transaminases, lipids and glucose will be measured at the baseline and the end of the study.

Intervention Type
Supplement

Primary outcome(s)

Liver fat content and/or liver steatosis markers measured by transient elastography (Fibroscan) at baseline and after 12 weeks

Key secondary outcome(s))
Measured at baseline and after 12 weeks:
1. Disease progression measured by liver elastography
2. Insulin resistance measured by colorimetric test
3. Lipids in blood measured by colorimetric test
4. PCSK9 modulation measured by ELISA/colorimetric test
5. Inflammatory markers measured by colorimetric test
6. Endothelial function and other hemodynamic parameters measured by Endo-PAT

Completion date
30/09/2019

Eligibility

Key inclusion criteria
1. Over 30 years old
2. Both genders
3. Liver steatosis defined by CAP score over 216 dB/m

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
30 years

Sex
All

Total final enrolment
102

Key exclusion criteria
1. Past and current alcohol abuse
2. Clinical and laboratory signs of chronic hepatitis B and/or C virus infection
3. Allergies to cardoon, artichoke or maize
4. Triglycerides concentration over 250 mg/dl
5. Autoimmune or cholestatic liver disease
6. Liver cirrhosis
7. Pregnancy
8. Nephrotic syndrome

9. Chronic renal failure
10. Gastroesophageal reflux
11. Cancer
12. Taking amiodarone, antiretroviral agents, corticosteroids, methotrexate, tamoxifen, valproate. The study's protocol allowed to enrol only long-term lipid-lowering drugs users (more than 6 weeks)

Date of first enrolment
11/02/2019

Date of final enrolment
10/04/2019

Locations

Countries of recruitment
Italy

Study participating centre
Clinical Nutrition Unit of the “Mater Domini” Azienda University Hospital
viale Europa , Campus S. Venuta, University Magna Grecia
Catanzaro
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Sponsor information

Organisation
Italian Ministry of University and Research (MIUR)

ROR
https://ror.org/0166hxq48

Funder(s)

Funder type
Government

Funder Name
Ministero dell’Istruzione, dell’Università e della Ricerca Nutramed Project, PON 03PE000_78_1

Alternative Name(s)

Ministry of Education, University and Research, Ministry of Education, Universities and Research, Italian Ministry for Universities and Research, Italian Ministry for Education, University and Research, Italian Ministry of Education, MIUR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Italy

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Prof. Pujia (Pujia@unicz.it).

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	11/08/2020	02/09/2020	Yes	No
Results article		26/11/2022	06/09/2023	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes