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Monocentered, randomised, placebo-controlled, double-blind cross-over study on the effect of Conjugated Linoleic Acid (CLA) on fasting and postprandial metabolic parameters and endothelial function in men with PPARγ2 P12A polymorphism and controls

Submission date 07/06/2007	**Recruitment status** No longer recruiting	[_] Prospectively registered [_] Protocol [_] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 25/07/2007	**Overall study status** Completed	
Last Edited 17/12/2009	**Condition category** Other	

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
N/A

Study information

Scientific Title

Acronym
CLA2 (Conjugated linoleic acid 2)

Study objectives
Conjugated Linoleic Acid (CLA) may beneficially affect lipid and glucose metabolism, inflammatory responses and body weight. These aspects are of relevance for subjects afflicted with or prone to develop so called metabolic syndrome, which is characterized by an insulin resistance, dyslipidaemia, essential hypertension and adiposity of the central type and frequently leads to early manifestation of type 2 diabetes mellitus, increased vascular risk and risk of atherosclerosis.

Studies of the influence of dietary CLA, namely the individual isomers cis9,trans11-CLA and trans10,cis12-CLA as well as the commercially available 50:50 mixture of these isomers, as compared to linoleic acid as control, on fasting and postprandial metabolism. The study will test if there are genotype-dependent specific effects of the PPARγ2 P12A polymorphism (P12P versus A12A homozygosity). Expression of genes relevant for inflammation and metabolic regulation will be examined in monocytes independent of a PPARγ2 polymorphism. Further parameters to assess atherogenic processes are the expression of adhesion molecules (ICAM, VCAM, E-Selectin). Low Density Lipoprotein (LDL) will be isolated and tested for adhesion molecules expression on endothelial cells. As another study reported that a mixture of CLA isomers impairs endothelial function, this parameter will be determined in our study, with particular attention for the effect of individual isomers. As dietary fats may acutely change endothelial function, this parameter is tested both in the fasting state and following a fat-rich meal. Genotype-dependent specific effects on fat tissue are to be examined by determining the gene expression profile of the subcutaneous fat tissue. Furthermore the effect of CLA on fecal flora will be assessed.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethic Committee of the Medical Faculty of the Christian-Albrechts-University of Kiel, (Germany), approved on 13.09.2006 (ref: A151/06)

Study design
Randomised, double-blind, placebo-controlled, interventional, crossover study.

Primary study design

Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Not specified

Study type(s)
Not Specified

Participant information sheet

Health condition(s) or problem(s) studied
Not applicable

Interventions
All participants will consume, in random order, capsules with either the individual isomers cis9, trans11-CLA and trans10,cis12-CLA as well as the commercially available 50:50 mixture of these isomers, and linoleic acid as control. The material is provided as free fatty acids in capsules. Tocopherol content of the preparations is standardized.

Each intervention will last for 4 weeks, interrupted by wash-out periods of 6-9 weeks between the interventions.

Intervention Type
Drug

Phase
Not Specified

Drug/device/biological/vaccine name(s)
Conjugated Linoleic Acid

Primary outcome measure
Change of postprandial triglyceride levels (Area Under the Curve [AUC]) after 28 (±2) days supplementation. Postprandial triglyceride levels will be measured at the start of the study and after each intervention period.

Secondary outcome measures
Measurements for the following will be made at the start of the study and after each intervention period.

Changes in:
1. Fasting and postprandial insulin (AUC)
2. Fasting and postprandial glucose (AUC)
3. Endothelial function (PAT-Index)
4. Body Mass Index (BMI)
5. Waist circumference (WC)
6. Waist to hip ratio (WHR)
7. Blood pressure, pulse

8. HOMA (Insulin-glucose-product)
9. Metabolic regulatory parameters, namely:
9.1. Glucose dependent insulinotropic polypeptide (GIP)
9.2. Adipsinresistin
9.3. Cholesteryl Ester Transfer Protein (CETP)
9.4. Adiponectin
9.5. Leptin
9.6. Cholezystokinin (CCK)
9.7. Acylation Stimulating Protein (ASP)
10.1. Lipids and apolipoproteins, namely:
10.2. VLDL, total
10.3. LDL- and HDL-cholesterol
10.4. Lipoprotein a (Lp [a])
10.5 Lipoprotein lipase (LpL)
10.6. Apoliprotein AI, AII, and B100
10.7. Fatty acid pattern in cholesteryl esters
10.8. Phospholipids
11. Oxidative modification of lipids and oxidative stress, namely:
11.1. Oxidised LDL
11.2. isoprostanes
11.3. LDL-induced adhesion molecule expression
11.4. Platelet-Activating Factor (PAF)
11.5. total glutathione in erythrocytes,paraoxonase
11.6. Platelet-Activating Factor AcetylHydrolase (PAF-AH)
12. Inflammatory parameters, namely:
12.1. C-reactive protein (CRP)
12.2. Vascular Cell Adhesion Molecule (VCAM)
12.3. InterCellular Adhesion Molecule (ICAM)
12.4. E-selectin, InterLeukin-6 (IL-6)
12.5. Tumor Necrosis Factor-α (TNFα)
12.6. Monocyte Chemoattractant Protein-1 (MCP-1)
12.7. Vascular Endothelial Growth Factor (VEGF)
13. Gene expression profile in adipocytes (fasting adipocyte biopsy) and monocytes (fasting monocyte isolation) by Random-Zell-RNA-assay: expression of genes which may affect lipid metabolism and inflammatory responses (arteriosclerosis)
14. Fecal flora

Overall study start date
11/10/2006

Completion date
12/07/2007

Eligibility

Key inclusion criteria
1. Healthy male volunteers aged 45-68
2. Homozygosis of PPARγ2 P12A polymorphism
3. Member of the Metabolic Intervention Cohort Kiel (MICK)

BMI- matched controls will be recruited.

Participant type(s)
Patient

Age group
Adult

Sex
Male

Target number of participants
40

Key exclusion criteria
1. Participation in a clinical study with a medicament or a medicinal product within the last 30 days or simultaneous participation in another clinical examination
2. Inability to understand and to comply with the study protocol
3. Known metabolic or gastro-intestinal diseases, which affect the absorption, metabolism or excretion of food or food components
4. Condition after surgery of the gastro-intestinal tract, which affect gastro-intestinal motility
5. Hemoglobin <12 g/dL
6. Latex allergy
7. Diabetes (fasting glucose levels >125 mg/dl after repeated determination)
8. Surgery within the last 3 months, which still affects the current state of health
9. Intake of nitrate and/or calcium antagonists and/or alpha-blockers, which affect the blood pressure
10. Deformation of finger tips, which inhibits correct recording of EndoPAT
11. Illness of thyroid gland, which has metabolic and/or cardiovascular effect
12. Known hepatitis B, hepatitis C, HIV infection or chronic liver damage
13. Kidney insufficiency
14. Drug or alcohol abuse
15. Intake of drugs affecting the absorption, metabolism or excretion of food components or the gastro-intestinal motility
16. Intake of hormone preparations, particularly cortisone
17. Eating disorders, anorexia, bulimia, unusual outsider dietary habits
18. Psychiatric disorders, epilepsy, risk of suicide
19. For those who participate in adipose tissue biopsy, additionally:
19.1. Known allergies against local anaesthetics
19.2. Heart insufficiency
19.3. Coagulation dysfunction/consumption of drugs which may cause such dysfunctions

Date of first enrolment
11/10/2006

Date of final enrolment
12/07/2007

Locations

Countries of recruitment
Germany

Study participating centre
Bundesforschungsanstalt für Ernährung und Lebensmittel, Standort Kiel,
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Sponsor information

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Federal Research Centre for Nutrition and Food (BfEL) (Germany)

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Sponsor type
Government

Website
http://www.bfel.de

ROR
https://ror.org/045gmmg53

Funder(s)

Funder type
Government

Funder Name
Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung) (Germany)

Alternative Name(s)
Federal Ministry of Education and Research, BMBF

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Germany

Funder Name
Federal Ministry of Food, Agriculture and Consumer Protection (Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz) (Germany)

Funder Name
Cognis GmbH (Germany)

Results and Publications

Publication and dissemination plan
Not provided at time of registration

Intention to publish date

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	18/08/2009		Yes	No