

TirolGESUND: General Exercise, Smoking Undone, and Nutrition Diet

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Registration date 28/12/2022	Overall study status Completed	<input checked="" type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 11/09/2024	Condition category Other	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Smoking and diet are known risk factors for many diseases, including cancer, cardiovascular diseases, or metabolic disorders, and may promote premature cellular ageing. TirolGESUND investigates the effect of two lifestyle interventions, namely smoking cessation or intermittent fasting (both with additional optional exercise), over 6 months for the promotion of health and reduction of disease risk, focusing on women's cancers. We have recently described molecular (epigenetic markers) for risk of being diagnosed, or developing future, women's cancers, hence in this study we are only including female participants. Our primary endpoints are epigenetic markers of cellular ageing and disease risk. Additionally we will explore the impact of other biomarkers of health and disease over the time of the intervention.

Who can participate?

Healthy women aged 30-60 years in the Tirol region of Austria that have elevated disease risk due to heavy smoking (≥ 10 cigarettes a day for at least 5 years) or elevated body mass index (25-35 kg/m²) are able to participate. Participants should not have prior malignancies or major cardiovascular disorders as the study is primarily aimed to investigate primary prevention of diseases, i.e. prevention of disease occurrence.

What does the study involve?

Depending on participant characteristics, participants will either be guided to stop smoking or undergo intermittent fasting, i.e. eat food only over a window of 8 h per day, for 6 months. Participants are invited to sample collection at baseline and every two months thereafter. Collected samples include cheek swabs, blood samples, cervical samples, as well as fecal, saliva, and urine samples. At baseline and at the main timepoint (6 months), additional clinical tests to determine health status will be conducted, such as lung function and vascular health. Participants are also invited to optionally return at month 12 and month 18 after study initiation to donate follow-up samples.

What are the possible benefits and risks of participating?

Participants will receive support in implementing (putative) health-promoting interventions, including giving up smoking and intermittent fasting over 6 months, and are hence expected to personally benefit from participation. Risks are expected to be minimal as the study involves

only a behavioural/lifestyle change, but can include e.g. development of haematoma after blood sampling, mood swings due to smoking cessation, or hunger at the initiation of intermittent fasting.

Where is the study run from?

The study is run by the European Translational Oncology Prevention and Screening Institute at the University of Innsbruck, and participants are invited to the research clinic every 2 months. Additional study visitations at baseline and 6 months are at other clinical sites.

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

May 2020 to August 2022

Who is funding the study?

The study is funded by the European Translational Oncology Prevention and Screening Institute at the University of Innsbruck (Austria) and has received funding from the European Union under the Horizon 2020 framework programme, the Land Tirol, and the European Research Council.

Who is the main contact?

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Additional identifiers

Clinical Trials Information System (CTIS)

Nil known

Protocol serial number

Innsbruck Clinical Trial Center (CTC) 20210420-2560

Study information

Scientific Title

TirolGESUND: Baseline-controlled comparison of the effects of fasting dietary intervention or smoking cessation combined with exercise in healthy female Tyrolean volunteers aged 30-60 on epigenetic and multi-omic biomarkers of health, ageing, and disease

Acronym

TirolGESUND

Study objectives

Dietary intervention or smoking cessation result in a modulation of epigenetic biomarker scores of age, environmental exposure and cancer risk compared to baseline over 6 months.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Approved 03/12/2020, Ethics Committee of the Medical University of Innsbruck (Anichstraße 35, A-6020 Innsbruck, Austria; +43 (0)50 504-22293; ethikkommission@i-med.ac.at), ref: 1391/2020

Study design

Single-centre non-randomized baseline-controlled interventional study

Primary study design

Interventional

Study type(s)

Other

Health condition(s) or problem(s) studied

Monitoring of the response of epigenetic and other (multi-omic) biomarkers of ageing, exposure and disease risk to dietary or smoking cessation intervention, with the aim of piloting epigenetic and multi-omic biomarkers as surrogate endpoints for monitoring the prevention of age-associated diseases and cancer in healthy volunteers.

Interventions

Allocation to intervention depends on participant baseline characteristics (smoking versus non-smoking and elevated BMI).

The dietary intervention encompasses induction (1 month) and maintenance (5 months) of a 16:8 intermittent fasting regime (time-restricted eating to 8 h a day, fasting for remaining 16 h). During the introductory month, participants will only maintain a 14:10 intermittent fasting regime. Within the dietary intervention arm, participants are randomised to receive ketogenic supplement (MCT oil) or not.

Smoking cessation encompasses three guided smoking cessation group therapy sessions (6-12 participants per session) followed by smoking cessation (occurring in the second session).

All study participants, regardless of intervention (dietary or smoking) receive an additional optional exercise programme and motivational coaching over the duration of the study.

For each participant, the main study duration is 6 months with optional follow-up visitations at months 12 and 18.

Intervention Type

Behavioural

Primary outcome(s)

Epigenetic biomarkers of ageing and disease risk are measured at baseline and at 6 months using Illumina Human MethylationEPIC array on the samples, to obtain epigenetic WID disease risk and exposure scores

Key secondary outcome(s)

1. Description of general study characteristics relating to participation and dropout: sign-up rate, drop-out rate, compliance
2. Molecular endpoints (1): Evaluation of temporal and tissue-specific dynamics of epigenetic markers of ageing, disease risk, and exposure (e.g. smoking)
3. Molecular endpoints (2): Evaluation of microbial dynamics in fecal and saliva samples, including changes in overall diversity and proportions of certain beneficial or harmful microbial species in fecal microbiome depending on the intervention, distinction of health and lean individuals using microbiome, distinction of smokers and non-smokers using microbiome, shift in dominant types and association with weight loss and potential changes in functional prediction
4. Molecular endpoints (3): Exploratory investigation of metabolomic alterations in urine and saliva over 6 months of intervention.
5. Molecular endpoints (4): Exploratory investigation of cellular and humoral inflammatory dynamics over 6 months of intervention.
6. Clinical endpoints (1): changes in BMI and body composition (muscle, fat, water, abdominal fat composition) (diet arm of the study).
7. Clinical endpoints (2): changes in smoking status (smoking cessation arm of the study).
8. Clinical endpoints (3): Vascular health, including pulse wave velocity, intima-media thickness,

and plaque score before and after intervention.

9. Clinical endpoints (4): Physical activity and health, including activity status measured using the international physical activity questionnaire (IPAQ), sports examination (VO₂max), and fitness tracker (daily steps, active minutes, floors climbed); additionally measuring heart rate variability and resting heart rate

10. Clinical endpoints (5): Pulmonary health before and after intervention as measured by spirometry.

10. Psychological endpoints (1): Health-related quality of life (EuroQoL) before and after 6 months of intervention.

Completion date

30/08/2022

Eligibility

Key inclusion criteria

1. Women aged 30 to 60 years

2. Motivated to change their lifestyle

Smoking cessation intervention:

3.1. Smoking cessation: ≥10 cigarettes per day for at least the last five years

Dietary intervention:

3.2. Dietary intervention: BMI between 25 and 35 kg/m²

NB, should 3a and 3b apply, participants will be allocated to the smoking cessation intervention.

Participant type(s)

Healthy volunteer

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

30 years

Upper age limit

60 years

Sex

Female

Total final enrolment

156

Key exclusion criteria

1. Relevant underlying conditions:

1.1. Current or previous malignant tumour or cancer

1.2. Current or previous significant cardiovascular disorder [participants with elevated blood pressure are allowed to participate as long as it is well controlled under their current medication]

- 1.3. Current or previous metabolic disorder (e.g., diabetes type I or II) [in the dietary intervention arm, participants with current hypothyroidism/Morbus Hashimoto will be excluded as the switch to intermittent fasting may require a adjustment of their medication]
- 1.4. Current or previous psychiatric disorder (e.g., eating disorder, depression)
2. Current pregnancy or lactation period
3. Total hysterectomy
4. Known current or previous premalignant lesion of the cervix uteri (CIN2/3)
5. Concurrent participation in another interventional trial

Date of first enrolment

21/04/2021

Date of final enrolment

08/02/2022

Locations

Countries of recruitment

Austria

Study participating centre

European Translational Oncology Prevention and Screening Institute, University of Innsbruck

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Sponsor information

Organisation

Tirol Kliniken

ROR

<https://ror.org/028ze1052>

Organisation

Universität Innsbruck

ROR

<https://ror.org/054pv6659>

Funder(s)

Funder type

Government

Funder Name

Land Tirol

Funder Name

Horizon 2020 Framework Programme

Alternative Name(s)

EU Framework Programme for Research and Innovation H2020, Horizon 2020, Horizon 2020 Framework Programme (H2020), Rahmenprogramm Horizont 2020, Horizont 2020, Programa Marco Horizonte 2020, Horizonte 2020, Programme-cadre Horizon 2020, Orizzonte 2020, Programma quadro Orizzonte 2020, H2020

Funding Body Type

Government organisation

Funding Body Subtype

National government

Location

Funder Name

European Research Council - BRCA ERC Project

Results and Publications

Individual participant data (IPD) sharing plan

Current IPD sharing plan as of 12/09/2023:

The datasets generated during and/or analysed during the current study, in particular epigenetic, metabolomic, and microbial will be made available either completely anonymised wherever possible, or under controlled access (EGA-European Genome Phenome Archive, <https://ega-archive.org/> e.g., due to the sensitive nature of epigenetic data). All data will only be shared in a coded (pseudonymised) or completely anonymised format. Prior to use, any potential collaborators must sign a data access agreement and comply with the terms of data sharing. Some datasets (summary characteristics, or completely anonymised results) may additionally be published as a supplement to the results publications.

Data will be restricted for non-commercial research in the space of healthy ageing research. Sharing is restricted to certain geographical areas that have high GDPR standards.

Previous IPD sharing plan:

The datasets generated during and/or analysed during the current study, in particular epigenetic, metabolomic, and microbial will be stored in a publicly available but access-controlled repository (EGA-European Genome Phenome Archive, <https://ega-archive.org/>, or similar), due to the sensitive nature of epigenetic data. All data will only be shared in a coded (pseudonymised) or completely anonymised format. Prior to use, any potential collaborators must sign a data access agreement and comply with the terms of data sharing.

Some datasets (summary characteristics, or completely anonymised results) may additionally be published as a supplement to the results publications.

Data will be restricted for non-commercial research in the space of healthy ageing research. Sharing is restricted to certain geographical areas that have high GDPR standards.

IPD sharing plan summary

Stored in publicly available repository, Published as a supplement to the results publication

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Statistical Analysis Plan	version 1.0	01/11/2022	22/12/2022	No	No