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LIFE Tirol: Lasting health through intermittent fasting, emotional fitness and exercise in Tirol

Submission date
20/02/2023

Recruitment status
No longer recruiting

Registration date
04/04/2023

Overall study status
Completed

Last Edited
28/03/2023

Condition category
Other

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

Plain English summary of protocol

Background and study aims
By 2040, a dramatic increase is expected in the population group over 70 years of age in Tyrol. Austria has one of the highest expenditures on health within the European Union. Nevertheless, the "healthy life years" of Austrians are far below the EU average; specifically, Austrians only live an average of approximately 57 years in perfect health. To underscore this worrying fact, this is 16 years less than the “healthy life years” in Sweden, although both countries have similar expenditures. One conspicuous difference in the Austria-Sweden comparison is that Sweden spends significantly more on preventive care than Austria and this is exactly what we need to change. Health should be promoted to a greater extent before diseases arise, thus allowing us not only to grow older but spend the extra years of life in good health. Therefore, within the framework of the LIFE Tirol study, the health-promoting effects of intermittent fasting (IF), exercise (EXC), and/or psychological wellbeing (WB) stress reduction training will be investigated, how well these measures are accepted by the Tyrolean population, and how their quality of life changes within the course of the study.

Who can participate?
People aged between 18 and 75 years old can participate, they must be motivated to change their lifestyle, own a smartphone and be familiar with its use.

What does the study involve?
The study is based in Hall in Tirol with each subject participating for 8 months.
After a thorough explanation and the signing of informed consent, participants will be assigned to 1 of 5 intervention groups:
1. IF
2. EXC
3. WB (stress reduction, relaxation and resilience training)
4. IF + EXC
5. IF + WB

The classification is made after the enquiry about the physical activity pattern via a physical activity questionnaire. Those people with "little exercise" can be classified in IF, EXC or IF + EXC, and those who move a lot anyway can be classified in the groups IF, WB or IF + WB. Within these

three possible groups, the classification is purely randomised and cannot be influenced. A total of 5 visits take place within 8 months at the study centre. During the visits, changes in quality of life and sleep, stress, blood values, blood pressure, epigenetic markers, and much more are examined. During the first two months, participants do not know which group they have been assigned to and should continue to live as they normally would in order to establish their "baseline values".

What are the possible benefits and risks of participating?
Participants can expect lifestyle changes in diet and/or exercise and/or psychological well-being, professional counselling by dieticians, exercise therapists and/or psychologists, free medical check-ups, a fitness tracker, and a device for a ketone body measurement. We hope to gain new insights into sustainable lifestyle changes for many more people and individual prevention for certain diseases in the future. The risks comprise spotting after the cervical/vaginal smear test in female subjects, pain and/or bruising during blood collection (venous or capillary), side effects of dietary change such as feeling hungry or digestive problems in IF, and side effects of the increased amount of exercise
such as fatigue or sore muscles in EXC.

Where is the study run from?
European Translational Oncology Prevention and Screening (EUTOPS) Institute (Austria)

When is the study starting and how long is it expected to run for?
August 2021 to January 2024

Who is funding the study?
Standortagentur Tirol (Austria)
Horizon 2020 Framework Programme (Belgium)

Who is the main contact?
Prof Martin Widschwendter, martin.widschwendter@uibk.ac.at (Principal Investigator) (Austria)

Contact information

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
Nil known

Study information

Scientific Title
LIFE Tirol: Prospective randomised clinical trial assessing acceptance and efficacy of intermittent fasting, exercise and psychological wellbeing alone or in combination on intermediate surrogate endpoint markers

Acronym
LIFE Tirol

Study objectives
The study posits that lifestyle interventions such as intermittent fasting, exercise, and resilience training are accepted in the population of Tirol, the majority of participants adhere to the intervention at the end of the study with their quality of life and medical and biological parameters changing during these intervention/s.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 19/10/2022, Ethics Committee of the Medical University of Innsbruck (Anichstraße 35, 6020 Innsbruck, Austria; +43 (0)50 504-22293; ethikkommission@i-med.ac.at), ref: 1204/2022

Study design
Single-centre prospective randomized longitudinal non-therapeutic intervention study

Primary study design
Interventional

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Primary prevention through a change in lifestyle

Interventions
Participants are stratified according to BMI and level of exercise and randomly assigned using a computer-based age- and gender-stratified block randomisation into groups of four subjects each to one of the following interventions: intermittent fasting (IF), exercise (EXC), psychological wellbeing (WB), IF plus EXC, or IF plus WB. For each group, the intervention was provided by: IF: dieticians with a Bachelor's degree in dietetics; EXC: sports scientists with a Bachelor's degree in sports science and experience in health and prevention sports and individual training; and, WB: psychologists with a Master's or at least Bachelor's degree in Psychology.

For the IF group, the subjects undergo a 16:8 IF regime (i.e., 16 hours of fasting versus 8 hours of eating per day; the subjects can decide when in the period from 6 am to 4 pm to include the 8 hours eating interval) for 6 days per week. Participants who are randomised into the EXC group receive a training programme, the aim of which is to achieve at least 150 minutes of health-enhancing exercise per week. In the WB group, the subjects undertake modules which they have to perform or pass in order to progress to new modules. The interventions are planned for 6 months in total and if participants are assigned to a combination of interventions then the second intervention will commence 2 months after the first intervention. The randomisation occurs before the second visit after the two-month run-in phase.

The interventions start with a face-to-face meeting at the second visit and are all provided individually. Afterwards, it differs per intervention: dieticians see their participants in the course

of each visit (i.e. four times; each 2 months apart) in a face-to-face meeting. For the EXC intervention after the first face-to-face meeting, there will be monthly online meetings specifically for the study-designed app (LIFE&SUN Tirol). In the WB group, the experts will see their participants every two weeks in an online meeting via the LIFE&SUN Tirol app after the first face-to-face meeting. The EXC and WB consultation frequency is the same for the combined interventions (IF plus EXC or IF plus WB), the only difference is that the second intervention (i.e. EXC or WB) starts only at the third visit, whereas IF always starts at the second visit. A cervical /vaginal smear test is taken from female participants at each of the five visits and is used to measure the effect of each intervention regarding epigenetic markers.

The intervention mostly takes place at each participant's home since they are supposed to change their lifestyle. The study center, where the visits take place and the consultations are performed, is located in the hospital of Hall in Tirol, Austria, although the rooms are rented and the study itself has nothing to do with the hospital.

Intervention Type
Behavioural

Primary outcome(s)
1. Reaching the planned number of participants (n=600) within 6 months, used as an indirect measure of the acceptance of lifestyle interventions measured using study records from baseline to 6 months recruiting time.
2. Proportion of participants who adhere to the intervention (> 80 %) measured using study records at baseline and eight months after the start of the study for each participant.
3. Change in quality of life measured using the WHO quality of life questionnaire (WHOQOL) at baseline and 2, 4, 6 and 8 months after the start of the study, comparing between the randomized groups per stratum and across stratum, including change from baseline.

Key secondary outcome(s))
1. Longitudinal effectiveness: change in the following parameters assessed at the intervention-free run-in phase in the first two months within the five intervention groups (IF, EXC, WB, IF+EXC, IF+WB) and at the end of the study (8 months after entry), using both per-protocol and intention to treat analyses:
1.1. Sleep duration and quality measured using the Pittsburgh Sleep Quality Index (PSQI)
1.2. Blood pressure and pulse measured using the device Boso Medicus X (Bosch + Sohn)
1.3. Stress measured using the stress measurement tool (heart rate variability) of a fitness tracker (Garmin vívosmart® 4) and the Perceived Stress Scale (PSS-10)
1.4. Laboratory parameters (blood count and differential blood count, LDL, HDL, HbA1c, creatinine, CRP): All laboratory parameters are measured using CE-IVD test systems and ISO9001: 2015 procedures: Blood count and differential blood count are measured by flow cytometry on a Sysmex XN-3000 module. CRP, HDL and LDL are measured by immunologic methods (CLIA) using a Roche Cobas 801 module. HbA1c is measured by an immunologic method (TINIA) using a Roche Cobas 513 analyzer and Creatinine is measured by an enzymatic method using a Roche Cobas c702 analyzer.
1.5. Bioelectrical impedance measured using the device BIA Corpus RX4004M (Medical)
1.6. Vascular elasticity measured using the device Vicorder®
1.7. Epigenetic markers using buccal and cervical/vaginal smears and blood: epigenetic ageing signatures (WID-SOLA, relative epithelial and immunological age), and other WID indices associated with disease (e.g. WID-BC, WID-OC) measured using DNA methylation analysis.
2. Effectiveness in group comparison: comparison of the effectiveness of the five interventions comparing the adherence to the interventions, changes in quality of life and sleep, sleep

duration, blood pressure and pulse, stress, laboratory parameters (blood count and differential blood count, LDL, HDL, HbA1c, creatinine, CRP), bioelectrical impedance, vascular elasticity and epigenetic markers between the five interventions groups at baseline and at the end of the study (8 months after entry).
3. Validation of further DNA methylation signatures (pcgtAge and other published signatures) and evaluation of which DNA-based changes (DNAme or DNAmut measured using arrays or sequencing or real-time PCR) occur depending upon the different interventions at baseline and at the end of the study (8 months after entry)
4. Analysis of metabolomics and lipidomics (including amino acids and acylcarnitines): Metabolomic assessment is performed via LC-MS/MS from self-obtained dried blood spot samples (EBF 903 4 Spot Blood Card (EU)) at baseline and after 2, 4, 6 and 8 months (end of study). For LC-MS/MS measurements the extracts are separated by hydrophilic interaction liquid chromatography (HILIC) using an Acquity UPLC® BEH HILIC 1.7 µm column (2.1 x 100 mm) for acylcarnitines or BEH Amide 1.7 µm column (2.1 x 100 mm) for amino acids (Waters). Lipid extracts from dried blood spot samples will be separated by reversed-phase chromatography on an InfinityLab Proroshell 120 EC-C8 2.7 µm column (2.1 x 100 mm; Agilent) for untargeted lipidomics analysis. A UHPLC system (Bruker) coupled to a timsTOF Pro ion mobility Mass Spectrometer (Bruker) will be employed. Beta-hydroxybutyrate will be self-measured in capillary blood with FORA® 6 Connect at baseline and after 2, 4, 6 and 8 months (end of study).
5. Analysis of cellular measurements: distribution of the different immune cell populations (% and absolute values) in peripheral blood mononuclear cells (PBMCs); activation levels of monocytes and T-cells, and expression of adhesion molecules using RT-qPCR, cell culture experiments, or flow cytometry. Per-protocol and intention to treat analyses will be conducted and compared between the groups at respective timepoints, and separately comparing changes from baseline in each group.
6. Changes in the steroid hormone profile and other urinary parameters including cortisol, melatonin etc. at baseline and at the end of the intervention measured using dried urine cards (Dried Urine Test for Comprehensive Hormones (DUTCH); https://dutchtest.com/) in the intervention-free run-in phase and between month 6 and 8 of the participant's study period.

Completion date
15/01/2024

Eligibility

Key inclusion criteria
1. Aged between 18 and 75 years old
2. Motivated to initiate a change in lifestyle
3. In possession of a smartphone and familiar with its use

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Mixed

Sex
All

Key exclusion criteria
1. Current and/or past relevant previous diseases:
1.1.Malignant cancers (exception: non-melanocytic skin cancer)
1.2. Cardiac disease
1.3. Severe metabolic diseases, particularly diabetes mellitus (type 1 and type 2)
1.4. Serious psychiatric illnesses
2. Current pregnancy or breastfeeding period
3. BMI ≥ 40 kg/m2
4. Smoker or smoking cessation < 6 months previously
5. Concurrent participation in another interventional study

Date of first enrolment
02/11/2022

Date of final enrolment
30/04/2023

Locations

Countries of recruitment
Austria

Study participating centre
European Translational Oncology Prevention and Screening (EUTOPS) Institute
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Sponsor information

Organisation
Tirol Kliniken

ROR
https://ror.org/028ze1052

Funder(s)

Funder type
Government

Funder Name
Standortagentur Tirol

Alternative Name(s)
Standortagentur Tirol Ltd.

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
Austria

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

Results and Publications

Individual participant data (IPD) sharing plan
The data sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

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