

Effect of a high-intensity tandem bicycle exercise program on clinical severity, functional magnetic resonance imaging and plasma biomarkers in Parkinson's disease: a pilot trial

Submission date 06/02/2018	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
Registration date 08/02/2018	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
Last Edited 18/08/2020	Condition category Nervous System Diseases	<input type="checkbox"/> Individual participant data

Plain English summary of protocol

Background and study aims

Parkinson's disease is a frequent and progressive condition that causes shaking, difficulty walking and performing fine movements, and many other symptoms. Several drugs are currently available for the treatment of Parkinson's, but their effect is limited, so patients need more and better alternatives. Some studies have found that exercising might be good for people with Parkinson's, especially when it is done at a "forced rate", that is to say, causing the patient to out of their "comfort zone". Using a tandem stationary bicycle is a safe way of exercising for someone with Parkinson's. The aim of this study is to find out whether exercising on a tandem bicycle at a forced rate several times a week has a favourable effect on patients with Parkinson's disease.

Who can participate?

Patients aged 65 or older with Parkinson's disease

What does the study involve?

Participants are asked if they are able to regularly attend three high-intensity exercise sessions, including taking the time, expense, physical dedication and effort represented by this. Those who respond yes are allocated to the intervention group, and those who respond no are allocated to the control group. The control group receive usual care provided by their doctors. Participants in the intervention group receive usual care and also take part in a high-intensity tandem bicycle program: a 30-minute session consisting of a 10-minute warm-up followed by 20 minutes pedalling at 80 revolutions per minute or faster, three times a week over 16 weeks. Both groups are assessed before and after the intervention to measure the severity of their disease, the way their brain functions during movement with an MRI scan, and the blood levels of several markers of Parkinson's disease.

What are the possible benefits and risks of participating?

Possible benefits include improvements in general fitness and well-being, reductions in

Parkinson's disease symptoms, and improvements in some of the brain processes than have been altered by Parkinson's disease. The potential risks include muscular aches or minor strains from practicing exercise, and a minor bruise at the site of blood draw.

Where is the study run from?

Fundación Santa Fe de Bogotá (Colombia)

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

June 2014 to September 2016

Who is funding the study?

1. Fundación Santa Fe de Bogotá (Colombia)
2. Universidad del Rosario (Colombia)
3. Universidad de los Andes (Colombia)

Who is the main contact?

Dr Carlos O Mendivil

carlosolimpo@gmail.com

Contact information

Type(s)

Scientific

Contact name

Dr Carlos O Mendivil

ORCID ID

<https://orcid.org/0000-0001-5546-4206>

Contact details

Carrera 7 No 116-05, Of 413

Bogotá

Colombia

110111

+57 (0)3394949, ext 1248

carlosolimpo@gmail.com

Additional identifiers

Protocol serial number

ParkinsonTandem

Study information

Scientific Title

Effect of a high-intensity tandem bicycle exercise program on clinical severity, functional magnetic resonance imaging and plasma biomarkers in Parkinson's disease: a pilot trial

Study objectives

A high-intensity tandem bicycle program may provide benefits on the clinical condition, biochemical markers and functional neuroimaging of patients with Parkinson's disease.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Corporate Committee on Research Ethics (IRB) of Fundación Santa Fe de Bogota, 25/11/2014, ref: CCEI-2342-2014

Study design

Interventional parallel two-arm non-randomized single-center pilot study

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Parkinson's disease

Interventions

Potential participants from the Hospital's Parkinson's disease clinic were asked if they would be able to regularly attend three high-intensity exercise sessions of the described characteristics, including taking the time, expense, physical dedication and effort represented by this. Those who responded yes were assigned to the intervention group, and those who responded no were assigned to the control group.

After 8 weeks of physical conditioning, participants are allocated to:

1. Intervention group: Usual care plus a high-intensity tandem bicycle program: a 30-minute session consisting of a 10-minute warm-up followed by 20 minutes pedaling at 80 revolutions per minute or faster, three times a week over 16 weeks
2. Control group: Usual care provided by their doctors

Both groups were assessed before and after the intervention for:

1. The severity of their disease
2. The way their brain was functioning during movement with an imaging technique (fMRI)
3. The concentration of several substances that reflect the degree of improvement or deterioration that may be occurring with their Parkinson's

Intervention Type

Behavioural

Primary outcome(s)

Disease severity, assessed using the Unified Parkinson's Disease Rating Score (UPDRS) before and right at the end of the 16-week intervention period

Key secondary outcome(s))

Measured before and right at the end of the 16-week intervention period:

1. Maximal oxygen consumption (VO2 max)

2. Body composition measures: BMI, % body fat, % lean mass, abdominal circumference
3. Cortical activations in functional Magnetic Resonance Imaging (fMRI)
4. Plasma concentrations of Parkinson's disease biomarkers: BDNF, PGDF-BB, Cathepsin-D, NGF, RANTES, ICAM-1

Completion date

30/09/2016

Eligibility

Key inclusion criteria

1. Idiopathic PD confirmed by a movement disorder specialist
2. Hoehn & Yahr stage 1 to 3
3. Age 65 or younger
4. Stable dopaminergic therapy
5. A negative exercise stress test

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Senior

Sex

All

Total final enrolment

13

Key exclusion criteria

1. Surgery for Parkinson's disease
2. Cancer
3. Musculoskeletal diseases
4. Coronary disease
5. Hyperthyroidism
6. COPD
7. Severe visual problems
8. History of stroke
9. Anemia
10. Use of anticoagulants
11. Use of a pacemaker
12. Use of an insulin pump
13. Mini-mental score below 24

Date of first enrolment

01/04/2015

Date of final enrolment

01/03/2016

Locations

Countries of recruitment

Colombia

Study participating centre

Fundación Santa Fe de Bogotá

Carrera 7 No. 117 – 15

Bogotá

Colombia

110111

Sponsor information

Organisation

Fundación Santa Fe de Bogotá

ROR

<https://ror.org/03ezapm74>

Organisation

Universidad del Rosario

Organisation

Universidad de los Andes

Funder(s)

Funder type

University/education

Funder Name

Universidad de los Andes (University of the Andes)

Funder Name

Fundación Santa Fe de Bogotá (Santa Fe de Bogotá Foundation)

Funder Name

Universidad del Rosario

Alternative Name(s)

University of Rosario, Rosario University, UR

Funding Body Type

Private sector organisation

Funding Body Subtype

Universities (academic only)

Location

Colombia

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 Dr Carlos O Mendivil (carlosolimpo@gmail.com) and Dr Carolina Segura (carolinasegura2015@gmail.com). Type of data: anonymized primary data including group (intervention or control), demographics, baseline and final values of all study outcomes. When the data will become available: Data are already available and will remain available. By what access criteria data will be shared including with whom: Qualified researchers whose institutional affiliation we can verify. For what types of analyses: Whichever the researchers see fit. Whether consent from participants was obtained: consent was obtained from participants for the sharing of anonymized study data. There are no known ethical or legal restrictions in this concern.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	24/07/2020	18/08/2020	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes