ISRCTN48132950 https://doi.org/10.1186/ISRCTN48132950

Stand up for your health: The short-term effects of breaking up prolonged sitting on glucose control

Submission date
23/02/2016

Recruitment status
No longer recruiting

Registration date
25/02/2016

Overall study status
Completed

Last Edited
25/05/2018

Condition category
Nutritional, Metabolic, Endocrine

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Sedentary behaviour is defined as any waking behaviour that doesn't require much energy and involves mainly sitting down or reclining. Many people spend a large proportion of their day engaged in sedentary behaviour, such as watching television, working on a computer and driving. Previous research has found that people with a sedentary lifestyle tend to have high blood sugar (glucose) levels which could increase their risks of type 2 diabetes and cardiovascular disease (disease of the heart and blood vessels). Recent evidence suggests that those who break up long periods of sitting by standing or walking may help to reduce the negative effects of sedentary behaviour on blood sugar control. It is not yet known whether it is necessary to break up prolonged sitting with at least light-intensity walking or if simply standing can improve glucose control compared with uninterrupted sitting. The aim of this study is to examine the short-term effects of regularly breaking up prolonged sitting with short bouts of standing or light-intensity walking on blood sugar levels following a meal.

Who can participate?
Healthy adults aged between 45 and 65 who are employed full time in a job which involves prolonged sitting.

What does the study involve?
Participants are randomly assigned to undertake three different study conditions in a random order over five days (Monday, Wednesday and Friday). The study conditions last for five hours, and begin with the participants drinking two meal replacement drinks, which contain a known amount of energy and nutrients. The first condition involves uninterrupted, seated office work; the second condition involves seated office work, interrupted by two minutes of standing every 20 minutes; and the third condition involves seated office work interrupted by two minutes of light-intensity walking every 20 minutes. One hour before the start of the first morning, each participant has a glucose sensor (small, thin and flexible wire) inserted under the skin of their belly by the researcher, which is connected to a glucose recorder, stuck to the skin of the belly by an adhesive patch (continuous glucose monitoring system). The glucose sensor continuously measures the amount of glucose (sugar) in the fluid around the participants' cells (interstitial

fluid) and the glucose recorder records this concentration every five minutes. Participants wear the continuous glucose monitoring system (CGMS) for five days (until the end of the third study condition). The amount of time it takes for the glucose to be processed by the body in each case is then calculated for all participants from the data recorded by the CGMS.

What are the possible benefits and risks of participating?
Participants benefit from having access to information about their blood sugar levels, which are measured continuously throughout the study. There is a small risk that participants may experience bleeding, swelling, irritation or infection from having the CGMS attached.

Where is the study run from?
The study is run from the University of Bristol Centre for Exercise, Nutrition and Health Sciences, and takes place in eight workplaces with an office environment at the University of Bristol and surrounding area (UK)

When is the study starting and how long is it expected to run for?
April 2014 to March 2015

Who is funding the study?
1. National Institute for Health Research (UK)
2. Bristol Nutrition Biomedical Research Unit in Nutrition, Diet and Lifestyle (UK)

Who is the main contact?
Miss Laura Brocklebank

Contact information

Type(s)
Scientific

Contact name
Miss Laura Brocklebank

Contact details
Centre for Exercise, Nutrition and Health Sciences
School for Policy Studies
University of Bristol
12 Woodland Road
Bristol
United Kingdom
BS8 1TZ

Additional identifiers

Study information

Scientific Title
Stand Up For Your Health: The acute effects of breaking up seated office work with standing or light-intensity walking on interstitial glucose concentration

Acronym
SUFYH

Study objectives
The aim of this study is to examine the acute effects of regularly breaking up seated office work with short bouts of standing or light-intensity walking on interstitial glucose concentration.

Ethics approval required
Old ethics approval format

Ethics approval(s)
University of Bristol Faculty of Science Human Research Ethics Committee, 29/04/2014, ref: 4007

Primary study design
Interventional

Study design
Randomised three-period three-treatment crossover trial

Study type(s)
Other

Health condition(s) or problem(s) studied
Interstitial glucose control

Interventions
Each participant is visited at their workplace on three separate days over a period of a week (Monday, Wednesday and Friday) and perform three five-hour trial conditions in a random order

Uninterrupted sitting (control): participants performed five hours of uninterrupted seated office work, only rising from their chair to use the toilet.

Sitting interrupted by standing: participants rose from their chair every 20 minutes and stood as still as possible at their desk for two minutes.

Sitting interrupted by light-intensity walking: participants rose from their chair every 20 minutes and walked around their workplace at a light intensity (Borg RPE rating of 9) for two minutes.

In each condition, participants are asked to consume two meal replacement drinks (total of 600kcal of energy, 73.6g of carbohydrate and 23.2g of fat) at baseline. One hour prior to commencing the first condition, a glucose sensor is affixed to the abdomen of participants to monitor glucose concentration every five minutes until the end of the condition. Participants wear their waterproof continuous glucose monitoring system (CGMS) for five consecutive days (until the end of trial condition three).

Intervention Type
Behavioural

Primary outcome(s)
Interstitual glucose concentration is measure using a continuous glucose monitoring system (CGMS) for the duration of the study (five days). The data recorded is used to calculate

postprandial and preprandial interstitial glucose incremental area under the curve (iAUC) after each of the five-hour trial conditions.

Key secondary outcome(s)
N/A

Completion date
06/03/2015

Eligibility

Key inclusion criteria
1. Between 45 and 65 years of age
2. Employed full-time in an entirely sedentary or semi-sedentary occupation

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Key exclusion criteria
1. Pregnancy
2. Clinically diagnosed diabetes
3. Non-English speaking
4. Taking lipid-lowering medication
5. Major illness or injury (acute or chronic)

Date of first enrolment
19/06/2014

Date of final enrolment
16/02/2015

Locations

Countries of recruitment
United Kingdom

England

Study participating centre

University of Bristol Centre for Exercise, Nutrition and Health Sciences
Centre for Exercise, Nutrition and Health Sciences
School for Policy Studies
University of Bristol
12 Woodland Road
Bristol
United Kingdom
BS8 1TZ

Study participating centre
Senate House
Tyndall Avenue
Bristol
United Kingdom
BS8 1TH

Study participating centre
The Hawthorns
14-16 Woodland Road
Bristol
United Kingdom
BS8 1UQ

Study participating centre
University of Bristol
School for Policy Studies
8 Priory Road
Bristol
United Kingdom
BS8 1TZ

Study participating centre
University of Bristol
IT Services
Computer Centre
5 Tyndall Avenue
Bristol
United Kingdom
BS8 1UD

Study participating centre

University of Bristol
Wills Memorial Library
Queen's Road
Bristol
United Kingdom
BS8 1RJ

Study participating centre
University of Bristol
Strategic Projects Office
8-10 Berkeley Square
Bristol
United Kingdom
BS8 1HH

Study participating centre
Queen's Building
University Walk
Bristol
United Kingdom
BS8 1TR

Study participating centre
University of Bristol
School of Economics
Finance and Management
8 Woodland Road
Bristol
United Kingdom
BS8 1TN

Sponsor information

Organisation
University of Bristol

ROR
https://ror.org/0524sp257

Funder(s)

Funder type
Government

Funder Name
National Institute for Health Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Funder Name
Bristol Nutrition Biomedical Research Unit in Nutrition, Diet and Lifestyle

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/08/2017		Yes	No