

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	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
Registration date 25/02/2016	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
Last Edited 25/05/2018	Condition category Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Individual participant data

Plain English Summary

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

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BS8 1TZ

Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers

N/A

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 hypothesis

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

Study design

Randomised three-period three-treatment crossover trial

Primary study design

Interventional

Secondary study design

Randomised cross over trial

Study setting(s)

Other

Study type(s)

Other

Participant information sheet

Condition

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 measure

Interstitial 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.

Secondary outcome measures

N/A

Overall study start date

01/04/2014

Overall study end date

06/03/2015

Eligibility

Participant 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

Age group

Adult

Sex

Both

Target number of participants

17

Participant 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)

Recruitment start date

19/06/2014

Recruitment end date

16/02/2015

Locations

Countries of recruitment

England

United Kingdom

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

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BS8 1TZ

Study participating centre

Senate House

Tyndall Avenue

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Study participating centre

The Hawthorns

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Study participating centre

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8 Priory Road
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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
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United Kingdom
BS8 1RJ

Study participating centre

University of Bristol

Strategic Projects Office
8-10 Berkeley Square
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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

Sponsor details

Research and Enterprise Development
3rd Floor Senate House
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Bristol
England
United Kingdom
BS8 1TH

Sponsor type

University/education

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

Publication and dissemination plan

Planned publication the results of this study in Diabetes Care.

Intention to publish date

31/12/2016

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