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Participant Information Sheet

**Effects of a short term day calorie restriction on T cell activation in fat**

*You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. One of our team will go through the information sheet with you and answer any questions. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.*

What is the purpose of this study?

Maintaining a healthy body weight can be difficult and this is becoming more and more of a problem in our modern society. Being overweight can put people at increased risk of various chronic diseases such as type 2 diabetes, heart disease and stroke. Recent research has suggested that the immune system (especially a type of low-level inflammation) might play an important role in the development of these diseases.

**Our previous research has suggested that there may be important differences in properties of certain immune cells located in the adipose tissue with increased overweight. We believe that these properties may be sensitive to dieting even for short periods of time. The main aim of this research is therefore to investigate changes in adipose before and after a short period of dieting compared to changes in blood. By investigating these changes we hope to learn more about the process of developing the chronic diseases and ultimately lead to development of more effective therapies and treatments**.

This study is part of a PhD (Doctor of Philosophy) project.

Why have I been invited?

If you are interested in taking part and conform to the requirements of the study then you may be eligible to take part. We intend to recruit 12 participants for this particular study. We are currently looking for males with a waist circumference >94cm, are aged between 35-55 years who have been weight stable for more than 3 months (weight not changed by more than 3%, e.g. by 3Kg if you weigh 100 kg / 6.6 pounds if you weigh 15 stone 10), are non-smokers, not taking any drugs and have no history of diabetes or heart disease.

Do I have to take part?

Participation in this study is completely voluntary and it is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and will be asked to sign a consent form. However, even if you give your consent to take part you are still free to withdraw from the study at any time without giving a reason.

What will happen to me if I take part?

If you would like to take part we will first confirm your eligibility by asking a few questions via telephone/email. If you are eligible we will then schedule a date for some preliminary measurements and assessment of body composition*.* We would also like you to monitor your normal lifestyle; i.e. food and fluid intake together with your physical activity patterns over a 1 week period sometime before the trial days and the lab visits and during the 3 day calorie reduction. During the two lab visits (which happen the day before and day after the 3 day calorie reduction period) we will take a baseline blood, saliva and adipose sample before asking you to consume a glucose drink and taking further blood samples for 2 hours. All tests and sampling will take place in the Physiology Laboratory at the University of Bath.

What do I have to do?

Following a preliminary meeting to discuss the trial and explain what is involved you will be required to visit the University on 3 occasions. The first visit should take no longer than 1 hour where we will take the preliminary measurements and give instructions for monitoring your normal lifestyle for 1 week. The 2nd and 3rd visits will be for the main trial days where you will have a scan to assess your body composition, following which you will remain in the laboratory for approximately 3 hours. During the 3 days between the 2nd and 3rd visits we would like you to reduce your calorie intake to 50% of your normal intake –we will provide you with instructions of how to work this out..

*Assessment of eligibility*

You will be asked a few questions to determine whether you meet the criteria for the study. If you are eligible and would like to take part we will schedule the dates for the preliminary testing and the main trial days.

*Visit one: Preliminary testing*

*Assessment of body composition*

During your first visit to the Laboratory we will take a range of measurements to provide information about your body weight and the proportion of fat and muscle tissue. Your height and weight will be measured using a stadiometer and balance scales respectively for calculation of your body mass index (BMI), and waist and hip circumferences will be measured using a tape measure. Sagittal waist height (abdominal height) will be measured using callipers.

Your body fat and muscle will be precisely assessed using dual-energy x-ray absorptiometry (DEXA) at the Sports Training Village at the University of Bath. This scan is non-invasive and is a specialized type of X-ray that can determine the amount of muscle and fat tissue. This technique uses a very low dose of radiation that is much less than that used during a normal x-ray, and is an equivalent radiation dose to a short haul flight from London to Europe or spending half a day in Cornwall (due to the increased background radiation in the earth). You will be asked to lie on a padded table, having removed any jewellery, glasses and any metal objects or clothing that might interfere with the x-ray images. The scan itself lasts for approximately 7 minutes during which time you will need to remain completely still.

*Monitoring of normal lifestyle*

We would like you to monitor your normal diet and activity patterns over a 1 week period prior to the main trial day so that we can estimate your activity levels and see how your dietary intake compares to average daily energy requirements. For this, we would like you to wear a heart rate monitor (Actiheart™) which is attached to your chest via 2 adhesive pads – some men may need to shave a small area the size of a £2 coin as hairs may interfere with the measurements. The device is detachable from the pads so that you can remove it while showering/bathing/swimming. We ask that you wear the monitor during sleep so that we get 24h measurements across the week. If it becomes detached, please re-attach it at the earliest opportunity – we will provide you with some extra adhesive pads and it is recommended that you change them on alternate days. You should continue to carry out your daily activities as normal and it would be helpful if you could record a diary of your activities during the week to help us interpret your results. We would also like you to weigh all the food and drinks that you consume during this 1 week period and record this in the diary too, we can provide scales and give you tips on how to do this easily. We will arrange to collect the monitor food scales and diary from you once you have finished.

*Requirements pre-trial days*

In the 2 days before each trial date, we ask that you refrain from any strenuous physical activities and on the day before your main trial day we ask that you consume no caffeine or alcohol and have fasted for at least 10 hours overnight before you come to the laboratory (e.g. no food or drink except water after 10pm if you are booked into the laboratory for 8am).

*Visit two: Main trial day 1*

The trial days will take place in the Resting Physiology Laboratory where you will be guided to an adjustable medical bed to make yourself comfortable for the morning as this is where all testing will take place.

*Laboratory measurements*

You will first be asked to lie down comfortably on the bed while we take a measurement of your blood pressure by inflating a ‘cuff’ around your upper arm and saliva sample by dribbling freely into a tube.

A cannula (small flexible plastic tube) will be inserted into a vein in your forearm so that small blood samples can be collected throughout the day without the need for repeated blood samples using a separate needle each time. This procedure uses a needle that is slightly smaller than those normally used when people donate blood. An anaesthetic cream will be applied to the skin to reduce any minor discomfort. Blood will be taken at baseline and then every 15 minutes until 2 hours after consumption of a glucose drink. The cannula will be removed once all blood samples have been taken.

A fat sample will then be collected from around your waist. To take the sample, the area will first be thoroughly disinfected before injection of local anaesthetic (lidocaine) using a small needle – a similar size to those used by diabetic patients to inject insulin. After 5 minutes the area will be completely anesthetised. A larger needle will then be inserted to collect a small amount of fat tissue (~1g). You shouldn’t feel anything during this procedure. This sample will only be collected by someone who is specially trained in this technique. There is likely to be some bruising for the few days after the sample has been taken. The chance of localized infection is small and good practice minimizes this risk.

After the baseline samples have been taken, you will then be provided with a glucose drink. Whilst we monitor your blood response, you will be able to read, work, watch DVDs or use the internet.

Once all samples have been collected you will be provided with lunch along with tea/coffee/juice.

*Three day calorie reduction period*

The day after your first main trial day we would like you to reduce your calorie intake by 50%. We will give you instructions on how to do this.

*Visit three: Main trial day 2*

This will be exactly the same as main trial day 1.

What are the possible benefits of taking part?

Although we cannot offer you any financial incentives for taking part in this study, you will be reimbursed for any travel expenses. At the end of the study, you will be given a copy of your results and personalised feedback regarding your:

* **Diet** (e.g. both good and bad aspects)
* **Physical activity levels** (e.g. how many calories you use per day compared to how may you consume in your diet)
* **Blood test results** including cholesterol, glucose, insulin
* **Blood pressure**
* **Body composition analysis** (precise % fat mass and muscle mass distributions)
* **Information on how to change diet to lose weight**

***It is possible that the tests being done in this study may uncover an underlying disorder;*** *however, it is important to note that the research staff at the Department for Health are scientists and are not medically trained (not medical doctors). The methods and equipment used are only suitable for scientific research and not certified for medical diagnosis so we cannot give medical advice or interpret your results. We will however give you your results from the study together with a normal range where available for easy comparison to the general population, but even if a result falls outside of this range it does not necessarily mean that there is a problem. Some results can be affected by diet, exercise, minor illness, however if you have any concerns about the results of any measurements we have made you should consult your general practitioner (GP) for specific medical advice.*

What are the possible disadvantages and risks of taking part?

You will be required to give up some of your time to take part in this study; approximately 1 hour for the preliminary measurements, a few minutes a day for recording activities and dietary intake over a 1 week period and the time during the main trial day in the laboratory. During the main trial day you will be able work or relax. You may bring your own laptop or we can provide one if you wish and there is free internet access. Alternatively you may wish to read or watch a DVD.

During the 3 day calorie reduction period you will feel hungry, however this is for a very short period yet should still invoke improvements in metabolic parameters and the effects will quickly disappear once you return to eating normally.

The DEXA scan exposes you to a very small dose of radiation equivalent to a short haul flight from London to Europe or spending half a day in Cornwall due to the increased background radiation in the earth. Nonetheless, this is still exposure to radiation. This is a technique that is widely used in hospitals for assessing bone mineral density for diagnosing osteoporosis and is also used in athletes to monitor soft tissue changes.

Using a cannula can sometimes cause minor bruising and the anaesthetic cream can occasionally cause irritation and redness to the skin, however, this is only temporary if it does occur. There is a very small risk of infection or embolism (a bubble or fragment of plastic becoming lodged in a blood vessel which could potentially interfere with blood flow), however, the occurrence of these events is very rare and risks are kept to a minimum by our strict adherence to best practice. The total volume of blood taken during the trial day is ~160mL which is approximately a third of the volume taken when a person donates blood and so this is a relatively small amount.

Taking the fat sample involves using a needle and so again there is a small risk of infection as with cannulation, however, this risk is minimised by our strict adherence to best practice. Some people experience a very small amount of bleeding during the hours immediately after the sample has been taken, however you will be closely monitored during the trial day and we will advise you regarding best practice for changing dressings where necessary. In the days following the sampling, you may notice some bruising and/or a small lump under the skin, however, these will typically return to normal within a few days/weeks, respectively.

**What happens if there is a problem?**

**If you have any general queries about taking part in research or if you have any complaints regarding the study, you can contact Ms Lisa Austin, the Research Hub Manager for the Department of Health at the University of Bath.**

**Ms Lisa Austin Tel: 01225 386575 email: L.Austin@bath.ac.uk**

**Will my taking part in the study be kept confidential?**

**All information which is collected about you during the course of the research will be kept strictly confidential for your privacy. All documents and samples will be labelled using a code and no identifiable information so that you cannot be recognised. Code identities will be stored on a password protected computer in a locked office at the University only accessible to the researcher. Furthermore, any results published from this study will be anonymous and include no identifiable information.**

**What will happen if I don’t want to carry on with the study?**

**Even if you have already given your consent to take part you are still free to withdraw from the study at any time without giving a reason.**

**What will happen to any samples I give?**

**Samples will be stored at −80°C in the Department for Health Biochemistry laboratory until all analysis is complete. This laboratory is alarmed and access is limited to the research group. Once the project is complete and results published the samples will be destroyed.**

**What will happen to the results of the research study?**

**When the study is finished, you will be given personalised feedback of your own results. The overall results of this study will be submitted for publication as a PhD dissertation/paper and presented, but no personal information will be included in any such publications.**

**Who is organising and funding the research?**

**This study is funded by a government research council (BBSRC), Unilever and the University of Bath.**

**Who has reviewed the study?**

**All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given a favourable opinion by the Frenchay Research Ethics Committee.**

**Further information and contact details**

**Thank you for expressing an interest in participating in this study. Please do not hesitate to get in touch with us if you would like some more information.**

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