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# Does salt and glycerol improve tolerance to fainting compared to salt alone?

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| **Submission date** | **Recruitment status** | [_] Prospectively registered |
| 13/08/2023 | No longer recruiting | [X] Protocol |
| **Registration date** | **Overall study status** | [_] Statistical analysis plan |
| 04/10/2023 | Completed | [_] Results |
| **Last Edited** | **Condition category** | [_] Individual participant data |
| 04/10/2023 | Circulatory System | [_] Record updated in last year |

## Plain English summary of protocol

Background and study aims
The purpose of this research is to determine if salt and glycerol can improve your ability to be able to stand upright for long periods of time and reduce the chance of fainting in people who are prone to fainting. It does this by supporting the blood pressure. Blood pressure can fall when standing, predisposing to dizzy spells or fainting episodes. Salt intake can boost blood pressure and make fainting episodes less likely to occur. Glycerol may also do this. However, it is not clear whether salt and glycerol have an added effect which is greater than salt by itself.

This study has been funded by the London District of the British Army and is being conducted with King's College London University and run at King's College Hospital. There is a team of researchers directly involved in the work as well as others assisting. One of these is a British Army Doctor, the others are civilian medical doctors, scientists or nurses.

Who can participate?
You can take part if you are local to London. We are interested in recruiting you for the study particularly if you have previously fainted. Participation is entirely voluntary.

What does the study involve?
The testing will take place over one day. Afterward, you'll need to take a supplement twice a day for a week. Following this, you'll return to the Research Facility for an additional two days. During these days, we'll redo the tests from the first two days. The whole study will last around 11 days, and you'll only need to be at the Clinical Research Facility for 4 days.

Day 1:
Tests usually happen in the mornings. Eat a light breakfast and avoid caffeine before coming. Also, don't exercise for 12 hours before testing. A member of the study team will ask about your medical history and general health. If you're healthy, you'll empty your bladder and undergo some urine measurements. You'll do a "tilt test" to assess blood pressure control and susceptibility to fainting. If you're very resilient to fainting, further testing might not be necessary, as the supplements may not affect you much.

For the tilt test, you'll lie on a bed with monitoring equipment attached. This includes an electrocardiogram (ECG) to measure your heart rate, a blood pressure monitor, and ultrasound measurements of your heart. Straps and a box over your legs will help you stand still. After 15 minutes of resting, the table will tilt slightly upright. After 20 minutes of standing, lower body negative pressure will be applied for 10 minutes at different levels.

The test will stop if you complete it or if you experience symptoms like dizziness or decreasing blood pressure/heart rate. After the test, you'll lie down and the monitors will be removed.

Day 2:
You'll return the 24-hour urine collection bottle. Body composition will be measured, blood pressure checked, ECG taken, and an echocardiogram of your heart done. Blood samples will also be taken to analyze salt handling and blood water content.

Days 3 to 9:
You'll take a supplement twice a day for a week. Mix the powder and liquid provided with water in a sports bottle and drink it in the morning and at lunch.

Day 10:
Return to the hospital. We'll prepare the supplement for you to take. The tilt test will be repeated, and you'll receive another 24-hour urine bottle.

Day 11:
Repeat blood tests, heart ultrasound, ECG, blood pressure measurements, and body composition checks.

What are the possible benefits and risks of participating?
No direct benefits.
The study will be conducted in a controlled laboratory setting, and most participants find the assessments to be tolerable. Your safety, privacy, and comfort will be a top priority. Here are potential discomforts or risks associated with the procedures:
During the tilt table test, you might experience some dizziness or lightheadedness due to lowered blood pressure or heart rates. Occasionally, participants might briefly faint, although this is uncommon and short-lived. The procedure itself is very safe.
The assessments will require you to stay still, which might lead to discomfort or boredom over time. However, we will strive to keep you comfortable throughout the study by providing pillows, blankets, and whatever is necessary.
Preparing the skin for electrode placement might cause minor irritation or redness. There's a possibility of a mild allergic reaction to the electrode gel or adhesive.
You'll need to do two blood tests and collect your urine for 24 hours on two occasions. This could be slightly inconvenient, especially for women, as it involves urinating into a container.
Alcohol consumption is not allowed during the study as it can affect the results. Additionally, we'll request that you refrain from starting any new exercise supplements.
Aside from these points, we ask you to maintain your usual routine. In rare instances, an unrelated medical condition might be identified during the study, and we will provide you with full information about it.

Where is the study run from?
King's College London (UK)

When is the study starting and how long is it expected to run for?
April 2020 to January 2023

Who is funding the study?
Ministry of Defence (UK)

Who is the main contact?
Dr Iain Parsons, iain.parsons@kcl.ac.uk

# Contact information

### Type(s)
Principal investigator

### Contact name
Dr Iain Parsons

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# Additional identifiers

### Clinical Trials Information System (CTIS)
Nil known

### Protocol serial number
20200419

# Study information

### Scientific Title
The effect on orthostatic tolerance of glycerol and salt compared to salt loading alone: a double blinded randomised controlled trial.

### Study objectives
Salt and glycerol do not increase orthostatic tolerance above that of salt loading.

### Ethics approval required
Ethics approval required

### Ethics approval(s)

approved 09/04/2020, Ministry of Defence Research and Ethics Committee (MODREC Secretariat Bldg 005, G02 Dstl Porton Down, Salisbury, SP4 0JQ, United Kingdom; +44 (0)1980 956351; MODREC@dstl.gov.uk), ref: 962/MODREC/19

### Study design
Interventional double-blinded randomized controlled trial

### Primary study design
Interventional

### Study type(s)
Diagnostic, Treatment

### Health condition(s) or problem(s) studied
Vasovagal syncope

### Interventions
Participants will be randomised in a simple fashion to either sodium chloride supplementation (SALT) or salt and glycerol (SALT+) for 1 week.

### Intervention Type
Supplement

### Primary outcome(s)
Time to presyncope as measured for head-up tilt with lower body negative pressure pre and post intervention

### Key secondary outcome(s))
A difference in cardiovascular variables during head up tilt with lower body negative pressure pre and post intervention

### Completion date
05/01/2023

## Eligibility

### Key inclusion criteria
1. Healthy with no active medical treatment or taking regular medications or supplements (excluding contraceptives)
2. Aged 18-55 years

Participants who entered into the RCT aspect of the study:
3. Prior orthostatic mediated syncope or prior non-orthostatic mediated reflex syncope

### Participant type(s)
Healthy volunteer, Patient

### Healthy volunteers allowed
No

### Age group
Adult

### Lower age limit
18 years

### Upper age limit
55 years

### Sex
All

### Total final enrolment
75

### Key exclusion criteria
1. Individuals who are competing in competitive sports, for which glycerol supplementation is forbidden by WADA, will be excluded.
2. Volunteers taking ergogenic supplements within in the last month will be excluded.
3. Any participant with ongoing medical condition(s) which could be worsen with expansion of plasma volume will be excluded including those whom identify as having cardiovascular or neurological disease.
4. Participants taking prescription medications which could interfere with testing will be excluded
5. Participants who are pregnant or whom believe they may be pregnant, will be excluded

### Date of first enrolment
07/01/2021

### Date of final enrolment
10/06/2021

## Locations

### Countries of recruitment
United Kingdom

England

### Study participating centre
**King's College Hospital**
Denmark Hill
London
United Kingdom
SE5 9RS

# Sponsor information

**Organisation**
Ministry of Defence

**ROR**
https://ror.org/01bvxzn29

# Funder(s)

**Funder type**
Government

**Funder Name**
Ministry of Defence

**Alternative Name(s)**
MOD

**Funding Body Type**
Government organisation

**Funding Body Subtype**
National government

**Location**
United Kingdom

# 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 Iain Parsons, iain.parsons@kcl.ac.uk

**IPD sharing plan summary**
Available on request

**Study outputs**

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Participant information sheet | | | 23/08/2023 | No | Yes |
| Protocol file | version 17 | | 23/08/2023 | No | No |