PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT

The effect of acute paracetamol ingestion on deep body temperature during whole-body cooling

QUT Ethics Approval Number: 1700000623

RESEARCH TEAM

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DESCRIPTION

An individual at rest will maintain a normal body temperature, but the mechanisms of how it is maintained during cold exposure are not fully understood. It is possible that products produced through a biochemical pathway within the body are responsible, in part, for the maintenance of body temperature during cold exposure.

Paracetamol ingestion may block one of the possible pathways responsible for the maintenance of body temperature during body cooling. Further, older adults experience a greater risk of hypothermia given their diminished circulatory function. The purpose of this research is to study the possible implications of single dose (acute) ingestion of paracetamol on body temperature during cold exposure in young and older populations.

PARTICIPATION

We would like to invite you to take part in our research study. Before you decide, we would like you to understand what it would involve for you. Please ask us if there is anything that is not clear.

You **will not** be able to participate in this study if you meet any of the criteria below:

- Outside the target age range which is:
  - Young group: 18 to 35 years of age.
  - Older group: >60 years of age.
- Females not within the early follicular phase of the menstrual cycle (assessed by research team and detailed below).
- Have smoked within the previous 12 months.
- Diagnosed with a cold injury or suffer from any other peripheral vascular disorder (e.g. diabetes, Raynaud's).
- Regular cold exposure (e.g. outdoor swimmers).
- Any known thalassaemia affecting haemoglobin (e.g. Sickle-cell disease) – due to the condition affecting skin blood flow.
- Known carrier of Hepatitis B – due to the condition affecting skin blood flow.
- Hypertensive (upper limits of systolic/diastolic: 150/90 mmHg).

- Medications (prescribed, complementary, or over-the-counter) that have any direct or indirect cardiovascular effects.
- Those currently using warfarin.
- Previously exhibited hypersensitivity to paracetamol.
- Ingested paracetamol or consumed alcohol within the previous 24-hours prior to experimental trials.
- Those who have liver or kidney impairment.
- Those who have are on a low protein intake diet.
- History of asthma.
- Any wheezing brought on by taking paracetamol containing medications in the past.
- Angioedema or urticaria.
- No gastroenteritis (diarrhoea) or other reason for nil-by-mouth in the last week.

Research team members will review medications to determine whether they may have an effect on the cardiovascular system. In most instances determination of participation eligibility will be immediate, but where further clarification needs to be sought then you will be contacted within two working days.

If you are eligible and decide to participate you will be asked not to consume alcohol 24-hours prior to each visit to the laboratory. Additionally, you should not consume caffeine (e.g. coffee, tea, coke, red bull etc.) or take part in moderate activity (i.e. greater intensity than walking) 12 hours before your visits to the laboratory.

Your voluntary participation will involve **three sessions**; including one familiarisation and two experimental sessions. The familiarisation session will last one hour and experimental trials will last no longer than three hours each.

The total time required to complete the study is no longer than seven hours.

Familiarisation Session:
The familiarisation session will require you to complete a health history questionnaire and consent form. Following this, we will show you all equipment and procedures that will performed and utilized on the experimental testing days. If you are female we will also give you a small digital thermometer so you can record your oral (mouth) temperature on waking each morning for four weeks. Following this, you will be asked to bring the completed data to one of the research team for analysis. We will use this information to confirm menstrual cycle phase and time your experimental sessions to coincide with the end of the menses phase (i.e. day seven of the menstrual cycle).

Experimental Session:
The two experimental sessions will require you to attend the laboratory in a fasted hydrated state, separated by at least seven days. That is, we ask you not to eat anything from midnight the night before testing sessions. We will provide a selection of fruit, drinks and breakfast bars for you to consume as you wish on completion of each experimental test. You will attend the laboratory in the morning located at QUT, Kelvin Grove campus. Both trials will involve seated rest for a period of time in a comfortable temperature environment (~24 °C) and subsequently a cold environment (10 °C).

Upon arrival to the laboratory, blood (~6 mL) and urine (~20 mL) samples will be collected from you in order to determine your hydration status and menstrual cycle phase for females. To collect blood, a small cannula will be placed in a vein located in the proximal forearm and remain in place for the duration of the experiment. Samples of urine and blood will be stored within a secured swipe access

room for a period of time prior to their analysis and not be kept beyond the end of the research project. Subsequently, samples of urine and blood will be disposed in biological waste bins and destroyed. You will then be fitted with a variety of equipment which will measure variables such as heart rate and body temperature. Deep body temperature will be monitored by an ear thermometer and rectal thermistor (small type of thermometer). The rectal thermistor will be inserted and removed in a lockable private bathroom, by yourself, immediately prior to and following experimentation, respectively. All devices will record continuously throughout the testing session. Skin temperature will monitored using both small (3 cm diameter) thermocrons attached to the skin as well as using an infrared thermography camera. Using a small mouth piece we will also periodically analyse how much oxygen you are consuming during the experiment by analyzing your exhaled air.

After preparation, you will sit quietly for a period of 30 minutes in an air conditioned laboratory dressed in t-shirt, shorts, and trainers. Following this, you will be asked to ingest a liquid (~125 mL) that may or may not contain paracetamol. Immediately following ingestion of the liquid, you will be moved to an adjacent room maintained at 10 °C. Here you will sit for a period of time up to 120 minutes. Throughout the experiment we will monitor your body temperature, oxygen consumption, cognitive function (e.g. memory recall), thermal comfort and sensation (numerical scale). In addition to this, a small volume of blood will be periodically drawn from you. Finally, assessment of hand and pinch strength as well as manual dexterity will be measured pre- and post-cooling.

Your participation in this study is entirely voluntary. Your decision to participate or not participate will in no way impact upon your current or future relationship with QUT (for example your grades). If you do agree to participate you can withdraw from the study at any time without comment or penalty.

Any identifiable information already obtained from you will be destroyed. You may request your data to be removed from the study at any time.

EXPECTED BENEFITS

You will be paid $100 on completion of the study. The study will further the current knowledge regarding the effect of whole-body cooling on deep body temperature and use of paracetamol.

RISKS

There are some risks associated with your participation in this project. These include the cold exposure, paracetamol ingestion, stigma associated with inserting a rectal thermistor, skin irritation / allergy to adhesive tape, the blood collection process and the required time commitment.

Each risk associated with this study has been evaluated with appropriate management in place.

We will adhere to the upper limit of 1000 mg as recommended by the Australian Medicines Handbook. You are instructed not to ingest paracetamol within four hours of the dose ingested within the experiment. If pain relief is required within four hours of the experimental test, you may choose to use other pain relief medicines, such as codeine or ibuprofen. It is important all patient information is read and adhered to. As detailed in the exclusion criteria, mentioned here in this document and our ethics application, we will not be including anyone in the present study who presents any increased risk to liver damage as a result of paracetamol ingestion.

During the experiment we will expose you to cold air which will result in a decrease in deep body temperature which will be continuously monitored. If your rectal temperature reaches 36 °C at any time point we will cease the experiment, as this is a safety cut-off point. If you do reach this

temperature you will be moved to a warmer environment and monitored until your rectal temperature reaches 36.5 °C.

There is a small risk for injury to the ear drum with the ear thermometer, but as you will be gently placing the probe in yourself (with instruction) to where it is comfortable (similar to a cotton ear bud) and as movement is expected to be limited during testing, the risk is minimal.

Blood collection may cause some minor discomfort and the possibility of bruising around the puncture site. To minimise the chance of this occurring, where required, the application of ice will be applied following experimentation. Additionally, we will be using tape to keep skin probes in place and may, in some cases, cause redness on the skin. If redness does persist, the researchers will remove the tape and monitor the area.

PRIVACY AND CONFIDENTIALITY

All comments and responses will be treated confidentially. The names of individual persons involved in the study will not be made public. However, your study records (identifiable by code only) may be viewed for the purpose of source data audit by authorised persons within (e.g. ethics committee) or outside (e.g. regulatory bodies) of QUT.

Any data collected as part of this project will be stored securely as per the 'Australian Code for the Responsible Conduct of Research (NHMRC)' and the 'University Sector and Retention and Disposal Schedule (Queensland Public Universities)' policies. Please note that non-identifiable data from this project may be used, with your informed consent, as comparative data in future projects. Within the consent form you will note the request for photographs to be taken. Photographs, with your identity obscured, may be used within presentations to show the experimental set-up. These photos will be treated the same as all other research data detailed above.

CONSENT TO PARTICIPATE

We will ask you to sign a written consent form to confirm your agreement to participate.

QUESTIONS / FURTHER INFORMATION ABOUT THE PROJECT

If you have any questions or require further information please contact one of the researchers listed.

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CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE PROJECT

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Advisory Team on 07 3138 5123 or email humanethics@qut.edu.au. The QUT Research Ethics Advisory Team is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

THANK YOU FOR HELPING WITH THIS RESEARCH PROJECT.
PLEASE KEEP THIS SHEET FOR YOUR INFORMATION.