

Cardiovascular and cutaneous responses to the combination of alcohol and soft drinks: the way to orthostatic intolerance?

Submission date

25/01/2017

Recruitment status

No longer recruiting

☐ Prospectively registered

☐ Protocol

Registration date

01/02/2017

Overall study status

Completed

☐ Statistical analysis plan

☒ Results

Last Edited

14/02/2017

Condition category

Nutritional, Metabolic, Endocrine

☐ Individual participant data

Plain English summary of protocol

Background and study aims

Drinking alcohol is common among young people during festive events. Many studies have shown that drinking moderate amounts of alcohol leads to an increase in heart rate and the widening of blood vessels (vasodilation), as well as other issues with blood circulation. When standing upright, gravity means that blood falls towards the feet, and so the body must respond by increasing blood pressure to keep blood flowing to the brain. There is evidence to suggest that drinking alcohol can also interfere with this function (orthostatic hypotension). At festive events, alcohol is usually served with fruit juice or other kinds of sugary drinks. Although the effects of consuming alcohol have been well studied in healthy individuals, there is little research looking at the interaction of sugary drinks with alcohol on the regulation of circulation. The aim of this study is to look at the effects of drinking alcohol when combined with sugary drinks on the circulatory system (heart and blood vessels).

Who can participate?

Healthy adults aged between 18 and 30 who do not smoke.

What does the study involve?

Participants attend four study sessions spaced two days apart in a random order. All sessions take place between 08:00 and 09:00 in the laboratory after 12 hours of not having eaten. Before each session (at around 07:00), participants eat a light breakfast provided by the research team which consists of light ice tea and two cereal bars. They then complete a standing test before drinking either water mixed with lemon juice (condition 1), sugar and lemon juice mixed with water (condition 2), 40% vodka mixed with lemon juice and water (condition 3) or 40% vodka mixed with sugar, water and lemon juice (condition 4). Participants have their blood pressure monitored continuously for 120 minutes after drinking each drink.

What are the possible benefits and risks of participating?

There are no direct benefits or risks involved with participating in this study.

Where is the study run from?
University of Fribourg (Switzerland)

When is the study starting and how long is it expected to run for?
March 2015 to October 2016

Who is funding the study?
University of Fribourg (Switzerland)

Who is the main contact?
Dr Claire Maufras

Contact information

Type(s)
Scientific

Contact name
Dr Claire Maufras

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Additional identifiers

Protocol serial number
Alcopops

Study information

Scientific Title
Acute ingestion of sugar and alcohol in healthy young people: the way to orthostatic hypotension?

Study objectives
The vasodilatory properties of alcohol and the alcohol-induced dysregulation of autonomic tone are potentiated by the concomitant ingestion of sugary drinks in young people (simulating alcopops ingestion), and thus that the combination of sugars with alcohol will accentuate the systemic vasodilation and increase orthostatic intolerance.

Ethics approval required
Old ethics approval format

Ethics approval(s)

Commission cantonale d'éthique de la recherche sur l'être humain (CER-VD), 28/04/2015, ref: 105 /15

Study design

Randomised cross over study

Primary study design

Interventional

Study type(s)

Prevention

Health condition(s) or problem(s) studied

Acute alcohol ingestion in young people

Interventions

All participants attend four separate experimental sessions (each session separated at least by 2 days) according to a randomized crossover study. Randomization is performed using a random sequence generator (<http://www.random.org/sequences/>) where the session order is determined for 24 test subjects before the study starts.

All experiments take place in a quiet, temperature-controlled (20–22 °C) laboratory and started between 08.00 and 09.00 A.M. On the day of the experiment, after an overnight (12-h) fast, participants eat a light standardized breakfast provided provided by the research team at around 07:00, consisting of one mini-pack of 33 cl of commercial light ice tea (33 kcal, 8 g carbohydrates/6.6 g sugar) and two cereal bars (total of 150 kcal, 39 g carbohydrates/12 g sugar), to ensure that consumption of alcohol in the same morning is done on an empty stomach.

Following a variable period for reaching cardiovascular and metabolic stability (usually between 10-15 minutes), and after a stable baseline recording of at least 30 minutes, participants undergo an orthostatic test consisting of active standing from the sitting position, maintained during 10 min, and then returning to a sitting position. Participants then ingest one of the following four drinks at a temperature of around 10°C (at a convenient pace over 5 min):

1. 390 mL distilled water + 10 mL lemon juice
2. 48 g sucrose + 10 mL lemon juice, diluted in distilled water up to a total volume of 400 mL
3. 40% vodka (40% alcohol per volume, given at 1.28 mL.kg⁻¹ of body weight, providing 0.5 g alcohol/kg) + 10 mL lemon juice, diluted in distilled water up to 400 mL
4. 48 g sucrose + 40% vodka (at 1.28 mL.kg⁻¹) + 10 mL lemon juice, diluted in distilled water up to 400 mL.

Hemodynamic monitoring continues for another 130 minutes post-drink ingestion with a 10 min orthostatic test at 60 and 120 min post-drink ingestion.

Intervention Type**Primary outcome(s)**

Blood pressure is measured using a task force monitor at baseline and averaged over these different timepoints post-ingestion: 0-10min, 10-20min, 20-40min, 40-60min and 100-120min

Key secondary outcome(s)

Vasodilation was calculated using task force monitor (i.e. total peripheral resistance) and estimated using thermographic pictures (hand temperature) at baseline and averaged over these different timepoints post-ingestion: 0-10min, 10-20min, 20-40min, 40-60min and 100-120min.

Completion date

01/10/2016

Eligibility**Key inclusion criteria**

1. Aged 18-30 years
2. Non-smokers
3. No disease or medication affecting cardiovascular or autonomic regulation

Participant type(s)

Healthy volunteer

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Upper age limit

30 years

Sex

All

Key exclusion criteria

1. BMI greater than 30 kg.m⁻²
2. Competition athletes
3. Individuals with a daily exercise workload exceeding 60 min per day

Date of first enrolment

01/02/2016

Date of final enrolment

15/09/2016

Locations**Countries of recruitment**

Switzerland

Study participating centre
University of Fribourg
Department of Medicine/Physiology
Chemin du musee 5
Fribourg
Switzerland
1700

Sponsor information

Organisation
University of Fribourg

ROR
<https://ror.org/022fs9h90>

Funder(s)

Funder type
University/education

Funder Name
University of Fribourg

Alternative Name(s)
Universität Freiburg, University of Fribourg

Funding Body Type
Private sector organisation

Funding Body Subtype
Universities (academic only)

Location
Switzerland

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 Claire Maufrais (claire.maufrais@hotmail.com)

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Basic results		31/01/2016	14/02/2017	No	No