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Evaluating non drug therapies in older people with orthostatic hypotension

Submission date	Recruitment status	[_] Prospectively registered
19/12/2016	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
20/12/2016	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
04/01/2024	Circulatory System	

Plain English summary of protocol

Background and study aims
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. When this mechanism fails it is known as orthostatic hypotension (OH). It affects 3.5 million older people in the UK and results in a reduced quality of life, high symptom burden (dizziness, falls, blackouts, fatigue) and an increased chance of death. People affected by OH say the research priority should be to improve their quality of life but without more tablets. Currently the non-drug therapies used include drinking a glass of water quickly, compression stockings, and muscle contractions during standing. However, the research studies that suggest they work are small, very low quality and relate to younger people. Given that OH is predominantly a condition of older people it is important to determine whether these therapies work in this age group. The aim of this study is to look at the effectiveness of non-drug therapies for the treatment of OH in older people.

Who can participate?
Adults aged 60 years and over who are able to stand upright and have been diagnosed with OH.

What does the study involve?
All participants attend three study visits. On the first visit, participants undergo a range of tests in order to assess the severity of their OH symptoms and blood pressure drop when standing assessed. On the second visit, participants receive four treatments in a random order, with a 10 minute rest between treatments. The first treatment involves wearing compression stockings (tight stockings) on the lower legs. The second treatment involves having the abdomen compressed using a special binder. The third treatment involves having the abdomen and legs compressed. The fourth treatment involves tensing/contracting the muscles in the legs and buttocks (physical counter-manoeuvres). Each treatment lasts for about 10 minutes and patients are asked to stand up for three minutes afterwards, when they have their blood pressure drop measured. On the third study visit, participants are interviewed about their experiences of the different treatments.

What are the possible benefits and risks of participating?
There are no direct benefits of participating, but the results will help improve knowledge about which non-drug therapies for OH are worthy of further evaluation in a clinical trial to help

develop a way of helping people stick to the therapies in the long term. There are no notable risks of participating although for some participants giving up their time to take part may be inconvenient.

Where is the study run from?
Falls and Syncope Service, Royal Victoria Infirmary (UK)

When is the study starting and how long is it expected to run for?
February 2015 to April 2017

Who is funding the study?
National Institute for Health Research (UK)

Who is the main contact?
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Contact information

Type(s)
Public

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Additional identifiers

Protocol serial number
19750

Study information

Scientific Title
Non-drug therapies for orthostatic hypotension in older people: Determining basic efficacy and acceptability

Study objectives

The aim of this study is to determine whether non-drug therapies meet a basic level of efficacy in the treatment of orthostatic hypotension (OH) in older people.

Ethics approval required
Old ethics approval format

Ethics approval(s)
NRES Committee North East – Newcastle & North Tyneside 2, 09/10/2015, ref: 15/NE/0308

Primary study design
Interventional

Study design
Randomized; Interventional; Design type: Treatment, Device, Psychological & Behavioural

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Orthostatic hypotension (OH)

Interventions
Current interventions as of 17/09/2018:
Stage 1
After provision of informed consent, participants have their height and weight recorded before being invited to lie down on the couch. While supine, the participant will be connected to the monitoring equipment, all of which is external and non-invasive (Taskforce Monitor, CNSystems). There will be four small stickers placed on the individual (one on each shoulder, one on the left hip and one on the right ankle), and three larger stickers (one on the nape of the neck and one over the lower ribs on each side). The stickers will connect to the monitor via wires. There will also be a blood pressure cuff placed on the upper arm, and on the opposite side there will be a small blood pressure cuff on a finger. The participant will rest supine on the couch for 10 minutes.

The following tests will then be performed. At least two minutes rest will occur between tests:
1. Active standing: The participant is assisted into a standing position where they remain for 3 minutes, or sooner if symptoms require them to be seated. Following this test, they will rate the severity of their symptoms during standing using the Orthostatic Hypotension Questionnaire (OHQ).
2. Deep breathing: The participant will be asked to perform six controlled breaths in and out (each breath lasting ideally 10 seconds, but shorter cycles are acceptable).
3. Valsalva: The participant will be asked to blow into a tube for 10-15 seconds.
4. Cold pressor: The participant will be asked to place their hand into a bowl of icy cold water. They remove their hand when it becomes uncomfortable, their blood pressure rises or they manage 60 seconds, whichever occurs first. They will not be expected to continue if it is uncomfortable.

The participant will then rest in the seated position for 10 minutes to regain a stable blood pressure. The participant will be provided with a beaker of 480 ml of water, they will be asked to consume as much as they can manage within 5 minutes. The participant will then remain seated for 5 minutes. Then the active stand will be repeated following a 10-minute supine rest. The

assessment of water drinking as a therapy is performed separately from the other therapies as it requires a 'washout' period. The final part of Visit 1 will be to measure the participant's leg and abdomen size so that the correctly fitting compression stockings can be administered in stage 2. This visit lasts between 1.5-2 hours.

Stage 2
Once week later, participants attend a second study visit. Upon arrival the procedures will be explained to the participant and opportunity for questions provided. They will begin with a 10-minute supine rest while wearing the same monitoring equipment and will then undergo an active stand to re-establish a baseline blood pressure drop and symptoms for that visit. Following this baseline the participant will receive the following therapies and complete the OHQ questionnaire (symptom section only) after each one:
1. Compression stockings: Lower-limb compression stockings will be fitted to the participant's legs, they will then rest for 10-minutes and then stand upright for 3 minutes.
2. Abdominal compression: An abdominal binder will then be applied, the participant rests for 10 minutes and the active stand is repeated.
3. Leg and abdominal compression: Leg and abdominal compression are frequently used together, so these will be applied together and assessed during active stand.
4. Physical counter-manoeuvres (PCMs): This means tensing/contracting the muscles in the legs and buttocks (which can be achieved by squeezing the knees together for example).
Each therapy will be administered to each participant in a different order so that any theoretical impact of one therapy persisting over time will not have undue influence over the following therapy. The order of the therapies will be selected randomly (by the research assistant just prior to administering the therapies) from a set of 25 opaque, sealed envelopes (one per participant). There are 24 possible orders so one envelope will be selected at random and it's contents will be duplicated so that there are only two identical envelopes. This visit lasts approximately 1.5 hours.

Stage 3
Participants are interviewed about their experiences of the therapies to determine whether they are considered acceptable and how we could potentially help people to use them more. A choice of settings will be offered and will include the participant's own home, a meeting room in the Campus for Ageing and Vitality or Medical School in Newcastle University. Transport for the participant and their friend/family will be provided if required, as will refreshments. The same participants will be interviewed who took part in visit 1 and visit 2 as we would like to discuss their experience of the therapies used in visits 1 and 2. Participants will be welcome to have a friend/family with them during the interviews. It is anticipated that an approximate sample of 20 participants will be sufficient to achieve data saturation. The interviews will be performed by a research assistant (Ruth Pearce) who is highly experienced in working with older people in research settings and in performing qualitative interviews. They will be semi-structured using a topic guide (which will evolve over time being responsive to issues which arise during the interviews). The interviews are expected to last approximately 60 minutes but will stop if they go beyond 90 minutes. The interviews will be recorded on a digital recorder so that they can be later transcribed and analysed.

Stage 4
The most efficacious and acceptable therapies will progress into stage 4 and be evaluated as combination therapies. Bolus-water drinking was the most efficacious therapy and physical counter manoeuvres were the most popular therapy. Abdominal compression had mixed efficacy and acceptability. Therefore the following combinations were evaluated during postural BP

measurement:
1. Bolus water drinking + physical counter-manoeuvres
2. Bolus water drinking + physical counter-manoeuvres + abdominal compression

Participants will be randomised to the order in which they receive the above therapies. A total of 37 participants will undergo evaluation in stage 4 to determine whether the response rate to therapy is at least 20% more efficacious than the most efficacious single therapy.

Previous interventions:
Stage 1
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The research takes place during the three visits only. There are no interventions or changes to treatment between each visit/stage.

Intervention Type
Other

Primary outcome(s)
Postural systolic blood pressure drop is measured using non-invasive, beat-to-beat monitoring (Taskforce Monitor, CNSystems) at baseline (before intervention) and then during each intervention (visit 1 and visit 2).

Key secondary outcome(s)
1. Postural diastolic blood pressure drop is measured using non-invasive, beat-to-beat monitoring (Taskforce Monitor, CNSystems) at baseline (before intervention) and then during each intervention (visit 1 and visit 2)
2. Symptoms are measured using the Orthostatic Hypotension Questionnaire Symptom score at baseline and then immediately after orthostatic challenge with each intervention (visit 1 and 2)
3. Acceptability of and barriers to therapy are measured using data from qualitative interviews at visit 3

Completion date

31/10/2018

Eligibility

Key inclusion criteria
1. Aged 60 years or above
2. Clinical diagnosis of orthostatic hypotension (confirmed with a postural drop in systolic /diastolic blood pressure of at least 20/10 mmHg within 3 minutes of standing upright from a supine position).
3. Able to stand upright

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
60 Years

Sex
All

Total final enrolment
25

Key exclusion criteria
1. Age below 60 years
2. Dysphagia or previous episode of aspiration
3. Peripheral vascular disease or lower limb ulceration
4. Any contra-indication to bolus water drinking (such as a fluid restriction, cardiac/renal/liver failure)
5. Unable to provide informed consent

Date of first enrolment
09/12/2015

Date of final enrolment
19/04/2018

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Royal Victoria Infirmary
Falls and Syncope Service
Newcastle upon Tyne
United Kingdom
NE1 4LP

Sponsor information

Organisation
The Newcastle upon Tyne Hospitals NHS Foundation Trust

ROR
https://ror.org/05p40t847

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

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 Dr James Frith (james.frith@newcastle.ac.uk) until January 2021. If the request is approved, anonymised raw data will be provided in Excel format. A clear purpose for use of data must be provided, as well as a robust data management plan. Data will only be shared with individuals employed within the UK NHS or higher education institutions.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	qualitative results	17/12/2018	15/07/2019	Yes	No
Results article	quantitative results	14/08/2018	15/07/2019	Yes	No
Results article	quantitative results	14/03/2022	15/03/2022	Yes	No
Results article		27/02/2020	04/01/2024	Yes	No
HRA research summary			28/06/2023	No	No