ISRCTN03804536 https://doi.org/10.1186/ISRCTN03804536

The effect of reducing heart rate on central aortic blood pressure: a comparative study of ivabradine and atenolol on haemodynamic parameters at rest

Submission date
28/09/2007

Recruitment status
Stopped

Registration date
28/09/2007

Overall study status
Stopped

Last Edited
14/09/2012

Condition category
Circulatory System

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

Contact name
Dr Ian Wilkinson

Contact details
Lecturer and Honorary Consultant
Clinical Pharmacology Unit
Level 3, ACCI Building, Box 110
Addenbrooke's Hospital
Cambridge
United Kingdom
CB2 2QQ
+44 01223 336 806
ibw20@cam.ac.uk

Additional identifiers

Protocol serial number
N0544183629

Study information

Scientific Title
Ethics approval was received from the local Cambridge medical ethics committee before trial recruitment began.

Study objectives
1. Hypothesis: heart rate reduction per se leads to an accentuation of central aortic pressure irrespective of the mechanism of heart rate reduction or changes in peripheral blood pressure.
2. Aims: we aim to test the above hypothesis by employing a pharmacological approach: comparing the haemodynamic effects of a beta-blocker (atenolol) and a heart rate limiting drug (ivabradine) in a placebo-controlled crossover trial (ie all participants will get placebo, atenolol and ivabradine at some stage). Heart rate, central and peripheral blood pressure, cardiac output and arterial stiffness (the 'haemodynamic parameters') will be assessed at baseline and up to 4 hours after each acute dosing.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Not provided at time of registration

Study design
Placebo controlled crossover trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Cardiovascular: Haemodynamic parameters at rest

Interventions
STUDY DESCRIPTION
Up to 24 healthy people will be recruited in to the study via a poster asking for volunteers. The study will consist of 4 visits.

14/09/2012: Please note that this trial was stopped due to poor recruitment

INCLUSION AND EXCLUSION CRITERIA
Visit 1 - Volunteers will be interviewed, examined and formal consent obtained. Height and weight will also be taken and a 12 lead electrocardiogram (ECG) performed. The GP will be informed with the subjects agreement.
Visit 2, 3 and 4 - Subjects will be asked to have a light breakfast (excluding tea, coffee, alcohol) and arrive by 8.30am. They will lie down and an intravenous cannula will be inserted into the forearm through which we will take blood. They will also be connected to a heart monitor. After an hour, baseline measurements will be taken. This involves applying a probe to the surface of the neck and the wrist. Via a computer and software programme, we can then assess central

aortic pressure too. Haemodynamic parameters to be measured include: augmentation index, aortic and radial pulse wave velocity and analysis. These will be measured using the SphygmoCor system 2-Atcor Medical, Sydney, Australia. This will allow assessment of central aortic blood pressure using a validated transfer function. Electrodes placed on the chest will record heart rate. This will allow us to determine heart rate variability during specific times during the study with the SphymoCor HRV system. Similarly, cardiac output, stroke volume and cardiac index will be determined. Peripheral blood pressure will also be measured using a sphygmomanometer. Following this, we will take about 10-15ml of blood (approximately a tablespoonful) and send it for the measurement of sodium, potassium, calcium, creatinine, renin and aldosterone and catecholamines.
Then, subjects will be dosed with one of 3 pills orally: either atenolol 50mg, ivabradine 20mg or placebo (a dummy pill), but neither the volunteer nor the person doing the measurements will know which. Blood pressure readings will be repeated hourly and the blood tests at 4 hours. The final measurements will be made 4 hours post dosing, after which participants will be given food and drink and if the blood pressure and heart rate is acceptable, let home. Note that subjects are not permitted to eat or drink during the period of study. There will be a minimum 'washout' period of 3 days post which volunteers will attend for 2 more visits like the one described above but with different drugs (ie they will get all three types of pill during the course of the study).

ADVERSE EVENTS
Participants will be encouraged to report any adverse events and to contact members of the research team if they experience any problems. All serious adverse events will be reported to the Research and Development Department at Addenbrookes Hospital and other authorities as appropriate.

TERMINATION OF STUDY
The study will be ended when the last subject completes the study. Participants will be offered notification as to when any results might be published in the form of a scientific publication.

Intervention Type
Drug

Phase
Not Specified

Drug/device/biological/vaccine name(s)
ivabradine and atenolol

Primary outcome(s)
Assessing change in central blood pressure

Key secondary outcome(s))
Assessing change in haemodynamic parameters

Completion date
01/07/2009

Reason abandoned (if study stopped)
Participant recruitment issue

Eligibility

Key inclusion criteria
1. Volunteers aged 18-65
2. Subjects able to give informed consent
3. Normal blood pressure (< 140/90 mmHg but = 110/70 mmHg)
4. Resting heart rate = 50 beats per minute

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Upper age limit
65 years

Sex
Not Specified

Key exclusion criteria
1. Subjects with a history of hypertension or diabetes mellitus
2. Volunteers with a conduction defect on the ECG
3. Resting heart rate < 50 beats per minute and blood pressure < 110/70 mmHg
4. Pregnant women or those of childbearing age taking inadequate contraception
5. Volunteers with a history of asthma, cardiovascular disease or arrhythmias
6. Participants with a history of intolerance to beta-blockers or ivabradine

Date of first enrolment
01/06/2006

Date of final enrolment
01/07/2009

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Lecturer and Honorary Consultant
Cambridge

United Kingdom
CB2 2QQ

Sponsor information

Organisation
Record Provided by the NHSTCT Register - 2007 Update - Department of Health

Funder(s)

Funder type
Government

Funder Name
Cambridge Consortium - Addenbrooke' s (UK), Departmental Funds, NHS R&D Support Funding

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes