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Strategies for improving blood pressure control in Africa

Submission date	Recruitment status	[_] Prospectively registered
24/05/2016	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
31/05/2016	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
12/05/2017	Circulatory System	

Plain English summary of protocol

Background and study aims
Hypertension (high blood pressure) is the leading cause of disability and death in the world. It is a particular problem in Africa, where genetic causes of salt and water retention make hypertension more common, and make blood pressure control more difficult. In many cases, the exact cause of hypertension is not known, which can make finding the most appropriate treatment more difficult. By testing the blood for specific chemicals - renin (a kidney enzyme) and aldosterone (a hormone produced by the adrenal glands, located on top of the kidney) - it is possible to identify which treatments would be most effective based on the actual cause of the hypertension. The aim of this study is to look at the effectiveness of individualized therapy based on the physiological cause of the hypertension as determined from the plasma renin and aldosterone testing.

Who can participate?
Adult patients with resistant hypertension (blood pressure above 160/90 despite three medications) who are attending one of the three hypertension clinics participating in the study.

What does the study involve?
Patients are randomly allocated to one of two groups. Those in the first group continue to receive usual care according to the consensus guidelines of the country in which the clinic is located. Those in the second group take part in a new strategy of care based on finding the underlying physiological process that is causing the high blood pressure. This is done by taking a sample of blood and measuring levels of renin, and aldosterone. The results of these tests are then analysed and used to choose the most appropriate therapy. Participants in both groups are followed up after one year to find out if their blood pressure control has improved.

What are the possible benefits and risks of participating?
It is anticipated that the patients who take part in the new strategy will benefit from better blood pressure control. There are no notable risks involved with taking part in this study.

Where is the study run from?
1. Ladoke Akintola University of Technology Teaching Hospital (Nigeria)
2. Groote Schuur Hospital (South Africa)
3. Nakuru County Referral Hospital (Kenya)

When is study starting and how long is it expected to run for?
September 2013 to June 2016

Who is funding the study?
Grand Challenges Canada (Canada)

Who is the main contact?
Dr. J. David Spence
dspence@robarts.ca

Contact information

Type(s)
Scientific

Contact name
Prof J. David Spence

ORCID ID
http://orcid.org/0000-0001-7478-1098

Contact details
Robarts Research Institute
Western University
1400 Western Road
London
Canada
N6G 2V4

Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
01

Study information

Scientific Title
Physiologically individualized therapy for resistant hypertension in Africa

Study objectives
Individualized therapy for resistant hypertension will improve blood pressure control compared to usual therapy.

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Human Research Ethics Board of Western University, 20/08/2013 (renewal date: 10/11/2014), ref: 103876
2. University of Cape Town Faculty of Health Sciences Human Research Ethics Committee, 04/04/2013, ref: 169/2013
3. Ethical Committee Ladoke Akintola University of Technology Teaching Hospital, 20/06/2013, ref: LTH/OGB/Ec/2013/003
4. Egerton University Research Ethics Board, 22/07/2013, ref: EUIDVRE/009

Study design
Randomised controlled trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Prevention

Participant information sheet
No participant information sheet available

Health condition(s) or problem(s) studied
Resistant hypertension

Interventions
On the first study visit, participants have blood samples taken for measurement of plasma renin and aldosterone using kits provided by Diagnostics Biochem Canada Inc, and a sample of blood to be sent for DNA extraction and Sanger sequencing to identify genetic factors that may cause salt and water retention.

Patients are randomized using random numbers generated in SPSS, to either the usual care group (in which the plasma renin and aldosterone results are blinded to the physician and the patient) or the physiologically individualized treatment group, in which the plasma renin and aldosterone levels are used to choose the most appropriate therapy. The algorithm used to interpret the plasma renin and aldosterone levels and choose appropriate therapy was described in 2012 (Spence JD. Lessons from Africa: the importance of measuring plasma renin and aldosterone in resistant hypertension. Can J Cardiol. 2012 May;28(3):254-7. PMID: 22289470).

Participants in both groups are followed up for one year in the hypertension clinic, with visits scheduled according to the usual routine in each clinic.

Intervention Type
Drug

Phase
Phase III

Primary outcome measure
Blood pressure control, defined as a systolic pressure <140 mmHg and Diastolic Control is defined as a diastolic pressure <90, is measured using an automated blood pressure device at baseline and one year.

Secondary outcome measures
Nucleotide polymorphisms (SNPs) found in the candidate genes are measured using sanger sequencing at baseline in the intervention group only.

Overall study start date
03/05/2014

Completion date
22/05/2016

Eligibility

Key inclusion criteria
1. Blood pressure greater than 160 systolic or 90 diastolic
2.Currently on three medications including a diuretic
3. Attending the hypertension clinic at the study site
4. Aged 18 and over

Participant type(s)
Patient

Age group
Adult

Lower age limit
18 Years

Sex
Both

Target number of participants
120

Key exclusion criteria

1. Renal failure
2. Congestive heart failure
3. Patients with a serious health condition that would limit life expectancy to less than one year

Date of first enrolment
03/07/2014

Date of final enrolment
03/07/2015

Locations

Countries of recruitment
Kenya

Nigeria

South Africa

Study participating centre
Ladoke Akintola University of Technology Teaching Hospital
Cardiology Clinic
Department of Medicine
General area
Ogbomoso-Ilorin Road
Ogbomoso
Nigeria
202061

Study participating centre
Groote Schuur Hospital
Hypertension Clinic
Cape Town
South Africa
7925

Study participating centre
Nakuru County Referral Hospital
Medical Outpatient Department
Nakuru Town
Kenya
20100

Sponsor information

Organisation
Grand Challenges Canada

Sponsor details
Sandra Rotman Centre
MaRS Centre, South Tower
101 College Street, Suite 406
Toronto
Canada
M5G 1L7
+1 416 673 8122
winnie.luong@grandchallenges.ca

Sponsor type
Charity

Website
http://www.grandchallenges.ca/

ROR
https://ror.org/02snbhr24

Funder(s)

Funder type
Government

Funder Name
Grand Challenges Canada

Alternative Name(s)
Grands Défis Canada, GCC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Canada

Results and Publications

Publication and dissemination plan
An abstract has been presented at a meeting in Maputo, Mozambique, April 18 - 19, 2016. Planned submission of a paper on the main results in June 2016, and a paper on the genetic sequencing results in July 2016

Intention to publish date
31/12/2016

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/09/2017		Yes	No