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A developmental clinical study of management guided by coronary angiography combined with fractional flow reserve (FFR) measurement versus management guided by coronary angiography alone (standard care) in patients with Non-ST Elevation Myocardial Infarction

Submission date 16/11/2011	**Recruitment status** No longer recruiting	[_] Prospectively registered [X] Protocol
Registration date 13/01/2012	**Overall study status** Completed	[_] Statistical analysis plan [X] Results
Last Edited 04/10/2018	**Condition category** Circulatory System	[_] Individual participant data

Plain English summary of protocol

Background and study aims
Heart artery fractional flow reserve (FFR) is the pressure drop across a narrowed coronary artery. FFR is measured with a coronary 'pressure wire'. The pressure wire is approved and routinely used in angina patients but it is not used routinely in patients with recent heart attack because of a lack of evidence. We think that use of the pressure wire in patients with recent heart attack could alter and improve treatment decisions. To demonstrate whether this could be the case a large study would be needed. However, before such a study could be done, a 'developmental' study is needed first in order to gather 'pilot' information about whether or not the pressure wire might be useful.

Who can participate?
Heart attack patients having coronary angiography/angioplasty.

What does the study involve?
Following informed consent and angiography, participants will be randomly assigned to either the FFR-guided group or the angiography-guided (usual care) group. The pressure wire will be used to give an FFR measurement across all coronary narrowings at least 30% narrow, as clinically appropriate. The pressure wire will be used in all patients. The FFR value will be disclosed in the FFR group but not in the usual care group. Doctors in the FFR group will therefore have an FFR result which they may or may not choose to guide decision-making, while clinical decisions will be made in the normal way in the usual care patients. Follow-up will be for at least 6 months.

What are the possible benefits and risks of participating?
Participants will not benefit directly from taking part but we will obtain useful information on whether or not FFR measurement is useful and appropriate in heart attack patients. Participants will be supporting research to find new ways to assess and manage patients with coronary artery disease. Adenosine is used for FFR measurement. Adenosine can cause a feeling of chest tightness but this feeling only lasts during the time the adenosine is being given. Otherwise, adenosine is well tolerated. Pressure measurement usually means some extra angiogram pictures in order to position the coronary wire. This means you would receive a small additional amount of radiation which should not be harmful to you. The extra dose will be generally equivalent to a couple of x-rays of your lower back for each artery to be assessed. The actual dose is equivalent to 15 months background radiation and represents an additional risk of lifetime cancer of 1 in 7400.

Where is the study run from?
Participants will be recruited from the following sites:
1. West of Scotland Heart and Lung Centre, Golden Jubilee National Hospital, UK
2. Wessex Cardiothoracic Centre, Southampton University Hospital, Southampton, UK
3. Hairmyres Hospital, East Kilbride, UK
4. Royal Blackburn Hospital, Blackburn, UK
5. Freeman Hospital, Newcastle, UK
6. City Hospitals Sunderland NHS Foundation, Sunderland, UK

When is study starting and how long is it expected to run for?
The study ran from October 2011 to December 2012.

Who is funding the study?
British Heart Foundation (BHF) (UK).

Who is the main contact?
Ms Joanne Kelly
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Contact information

Type(s)
Scientific

Contact name
Ms Joanne Kelly

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Additional identifiers

ClinicalTrials.gov (NCT)
NCT01764334

Protocol serial number
11254

Study information

Scientific Title
Fractional flow reserve versus Angiographically guided Management to Optimise outcomes in Unstable coronary Syndromes: a developmental clinical study of management guided by coronary angiography combined with fractional flow reserve (FFR) measurement versus management guided by coronary angiography alone (standard care) in patients with Non-ST Elevation MI

Acronym
FAMOUS NSTEMI

Study objectives
Current hypothesis as of 06/05/2014:
1. Routine FFR measurement increases the proportion of NSTEMI patients that will be managed medically
2. Routine FFR measurement in NSTEMI patients is feasible and has additive diagnostic, clinical and health economic utility compared to standard care based on visual assessment of the angiogram

Previous hypothesis:
Do treatment decisions correspond to FFR values in individual coronary arteries in patients with recent non-ST elevation myocardial infarction (NSTEMI)?

Ethics approval required
Old ethics approval format

Ethics approval(s)
The West Glasgow Hospital Ethics Committee First MREC approval date 01/03/2011, ref:11/S0703/6

Primary study design
Interventional

Study design
Randomised; Interventional; Design type: Treatment

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Topic: Cardiovascular; Subtopic: Cardiovascular (all Subtopics); Disease: Coronary Artery

Interventions

The coronary pressure wire will be passed into each coronary artery that the cardiologist feels to have a stenosis >=50% and would be eligible for revascularisation (PCI or CABG). FFR will be collected during coronary hyperaemia during systemic intravenous infusion of adenosine, according to our standard cath lab NHS protocol (140 mg/kg/min)). FFR results will be made available in the FFR group by the Physiologist in the cath lab but not in the usual care group.

FFR group: in this group, doctors will have the FFR result available and can use this result to influence their treatment decisions as appropriate.

Usual care group: patients in this group will receive current best practice which involves visual assessment of the coronary angiogram with treatment decisions made in the usual way according to standard care.

Added 06/05/2014:
Clinicians and patients will be blinded to the FFR results in the angiography-guided group (double blind).

Intervention Type
Other

Phase
Not Applicable

Primary outcome(s)
Current primary outcome measures as of 06/05/2014:
The between-group difference in the proportion of patients allocated to medical management compared to revascularisation. The patients will be followed up every 6 months until the completion of the study (approx 2 years)

Previous primary outcome measures:
1. The between-group difference in the proportion of patients allocated to medical management compared to revascularisation. The patients will be followed up every 6 months until the completion of the study (approx 2 years)
2. Assessing the composite of all cause death/myocardial infarction (MI)/coronary artery bypass graft (CABG)/Heart Failure/stroke either in the index admission or through rehospitalisation

Key secondary outcome(s)
Current secondary outcome measures as of 06/05/2014:
1. The rate of discordance between FFR and visual assessment of coronary stenosis severity
2. Receiver operating curve (ROC) values for FFR and subsequent adverse events
3. Health-care costs associated with the index hospitalisation (or subsequent revascularisation)
4. Difference in EQ-5D QoL between each group at 12 months
5. Relationship between FFR results and health outcomes in the longer term
6. The composite of cardiovascular death/non-fatal myocardial infarction (MI)/unplanned hospitalisation for transient ischaemic attack or stroke
7. Cardiac death, or unplanned hospitalisation for myocardial infarction or heart failure
8. MI is defined according to the criteria specified in the Third Universal Definition of Myocardial Infarction (including Type 4 MI for PCI and Type 5 for CABG)

Previous secondary outcome measures:
1. The rate of discordance between FFR and visual assessment of coronary stenosis severity

2. Receiver operating curve (ROC) values for FFR and subsequent adverse events
3. Health-care costs associated with the index hospitalisation (or subsequent revascularisation)
4. Difference in QoL between each group at 12 months
5. Relationship between FFR results and health outcomes in the longer term

Completion date
01/05/2014

Eligibility

Key inclusion criteria
Current inclusion criteria as of 06/05/2014:
1. NSTEMI with at least one coronary artery disease (CAD) risk factor (e.g. diabetes, age > 65 years, prior CAD, prior peripheral vascular disease, hypertension, hyperlipidaemia, family history of CAD). These criteria were drawn from a recent clinical trial in NSTEMI (TIMACS, NEJM 2009)
2. Electrocardiogram (ECG) changes consistent with myocardial ischaemia (e.g. T wave inversion, ST segment depression; new or established)
3. Ischaemic symptoms (e.g. chest pain) for at least 10 minutes
4. Invasive management scheduled within 3 days of admission or a history of recurrent ischaemic symptoms within 5 days (according to contemporary published guidelines)

Previous inclusion criteria:
1. NSTEMI with at least one coronary artery disease (CAD) risk factor (e.g. diabetes, age > 65 years, prior CAD, prior peripheral vascular disease, hypertension, hyperlipidaemia, family history of CAD). These criteria were drawn from a recent clinical trial in NSTEMI (TIMACS, NEJM 2009)
2. Electrocardiogram (ECG) changes consistent with myocardial ischaemia (e.g. T wave inversion, ST segment depression; new or established)
3. Ischaemic symptoms (e.g. chest pain) for at least 10 minutes
4. Invasive management scheduled within 10 days of admission and ideally performed within 72 h or admission (according to contemporary published guidelines)

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Key exclusion criteria
1. Ongoing ischaemic symptoms (i.e. chest pain)
2. Cardiogenic shock or haemodynamic instability
3. Angiographic exclusion: reduced coronary flow (ie < TIMI grade III), highly tortuous or calcified arteries, left main stenosis >75% angiographically (ie consistent with severe left main disease
4. Life expectancy of < 1 year
5. Myocardial infarction (MI) with persistent ST elevation
6. Intolerance to antiplatelet drugs

7. Unsuitable for either percuataneous coronary intervention (PCI) or coronary artery bypass graft (CABG) on clinical or angiographic grounds
8. Coronary artery disease < 50% reference vessel diameter
9. Noncoronary cardiac surgery (e.g. concomitant valve repair or replacement)
10. Inability to give informed consent

Date of first enrolment
21/10/2011

Date of final enrolment
01/05/2014

Locations

Countries of recruitment
United Kingdom

Scotland

Study participating centre
Clinical Governance and Risk Management Development Unit (CGRMDU)
Clydebank
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Sponsor information

Organisation
National Waiting Times Centre Board (UK)

ROR
https://ror.org/0103jbm17

Funder(s)

Funder type
Charity

Funder Name
British Heart Foundation (BHF) (UK) (Grant Codes: PG/11/55/28999)

Alternative Name(s)

The British Heart Foundation, the_bhf, BHF

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

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?
Results article	results	07/01/2015		Yes	No
Results article	cost-effectiveness results	14/11/2015		Yes	No
Protocol article	protocol	01/10/2013		Yes	No