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The Enhanced Angiogenic Cell Therapy in Acute Myocardial Infarction (ENACT-AMI) trial

Submission date 12/02/2010	**Recruitment status** No longer recruiting	[X] Prospectively registered [X] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 17/02/2010	**Overall study status** Ongoing	
Last Edited 07/03/2025	**Condition category** Circulatory System	

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
NCT00936819

Secondary identifying numbers
MCT-90169

Study information

Scientific Title
Enhanced Angiogenic Cell Therapy in Acute Myocardial Infarction: a multicentre, phase IIb randomised placebo-controlled trial

Acronym
ENACT-AMI

Study objectives
The primary objectives of this study are to determine whether endothelial-like culture modified mononuclear cell (E-CMM) therapy is effective in improving cardiac function following acute myocardial infarction, and whether eNOS transfected E-CMMs are superior to non-transfected E-CMMs.

A secondary objective is to determine whether the efficacy of E-CMM therapy depends on the timing of cell therapy (5 - 10 days versus 11 - 30 days).

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 11/11/2011, Health Canada (Biologics and Genetics Therapies Directorate, Address Locator #0701B, Ottawa, Ontario, K1A 0K9, Canada; +1 (0)613 863 8405; brdd.dgo.enquiries@hc.sc.gc.ca), ref: Control # 150429 / File # 9427-O0476-39C

Study design
Phase IIb double-blind parallel randomized placebo-controlled trial

Primary study design

Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use the contact details to request a patient information sheet

Health condition(s) or problem(s) studied
Acute myocardial infarction

Interventions
After providing informed consent, all participants who meet the eligibilty criteria will undergo apheresis. Apheresis is performed to obtain mononuclear cells from the participant's blood. These cells are sent to a site-specific cell manufacturing lab where they will be processed according to the random allocation. The random allocation will be to:
1. Endothelial-like circulating mononuclear cells (E-CMMs)
2. E-CMMs transfected with human eNOS
3. Plasma-lyte A

Approximately 5 days later, the participant will receive the study treatment via intracoronary injection through the distal stent of the IRA during coronary angiography in the catheterisation suite. Study follow-up will include clinic visits the day after cell therapy, at 6 weeks, 3 and 6 months post-injection.

Intervention Type
Other

Phase
Phase II/III

Primary outcome measure
Change in global left ventricular ejection fraction (LVEF) from baseline to 6 months after study treatment as determined by magnetic resonance imaging (MRI).

Secondary outcome measures
Changes from baseline to 6 months after study treatment of:
1. Regional wall motion, wall thickening and infarct volume as determined by cardiac MRI
2. Echocardiographic assessment of LVEF and ventricular volumes
3. Time to clinical worsening (death, hospitalisation for angina, reinfarction)
4. Quality of life (36-item short form health survey [SF-36] and Duke Activity Status Index [DASI] questionnaires)

Overall study start date

01/05/2010

Completion date
18/09/2029

Eligibility

Key inclusion criteria
1. Male or female 18 - 75 years of age
2. Clinical diagnosis of ST-elevation myocardial infarction (MI) of greater than 1 mm in two adjacent electrocardiogram (ECG) limb leads, or greater than 2 mm in two adjacent ECG precordial leads, or a new left bundle branch block and an increase in cardiospecific enzymes (creatine kinase [CK] greater than 3 x upper limit of normal [ULN]), and either positive myocardial bands (MB) fraction or increase in troponin compared to institutional laboratory normal ranges
3. Patients who have suffered an acute Q-wave MI within the preceding 30 days prior to inclusion and have undergone percutaneous coronary intervention (PCI) with stent implantation in the infarct-related artery (IRA)
4. Culprit artery must have distal flow greater than thrombolysis in myocardial infarction (TIMI) 1
5. Left ventricular ejection fraction (LVEF) less than or equal to 45% by echocardiography (Simpson's Method) performed at least 2 days after onset of chest pain
6. In the case of previous MI, must have documentation of LVEF greater than 45% prior to index AMI
7. Females who are surgically sterile, or are post-menopausal, or have documented infertility, or are of child-bearing potential using one of the following methods of contraception:
7.1. Barrier-type devices (e.g., condom, diaphragm) used in combination with a spermicide; a double barrier method is recommended
7.2. Intrauterine devices (IUDs)
7.3. Oral or implanted contraceptives, if used in combination with a barrier method
8. Provided written informed consent

Participant type(s)
Patient

Age group
Adult

Lower age limit
18 Years

Upper age limit
75 Years

Sex
Both

Target number of participants
100

Total final enrolment

Key exclusion criteria
1. Significant unprotected left main disease (greater than 50% stenosis) on diagnostic angiography
2. Planned coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI) for a coronary stenosis greater than 70% in the non-infarct related artery (IRA)
3. History of sustained ventricular arrhythmias not related to AMI (evidenced by previous holter monitoring +/- medication history for sustained ventricular arrhythmias in the subject's medical chart
4. History of cerebrovascular accident or transient ischaemic attack less than or equal to 6 months
5. Any exclusion to magnetic resonance imaging (MRI) (includes already implanted automatic internal defibrillator or permanent pacemaker). Recent stent implantation is NOT an exclusion to MRI.
6. Persistent haemodynamic instability (need for ongoing pharmacological or mechanical support greater than 24 hours of the onset of chest pain)
7. Mechanical ventilatory support
8. Significant cardiac valvular disease
9. Left ventricular (LV) dysfunction from any other cause (e.g., non-ischaemic cardiomyopathy, collagen diseases)
10. Clinical evidence of persistent heart failure not responding to standard oral therapy
11. Clinical evidence of persistent ischaemia at time of cell therapy
12. Current pregnancy or nursing mothers
13. Known history of human immunodeficiency virus (HIV)
14. Known history of hepatitis B or C (hepatitis B surface antigen [HBsAg], hepatitis B [HB] core, hepatitis C [HC] antibody)
15. History of untreated ethanol (ETOH) or drug abuse
16. Creatinine clearance less than 60 by Cockcroft-Gault calculator (SI units)
17. Contraindications to apheresis (inadequate venous access or haematological exclusions)
18. Evidence of active infection
19. Significant co-morbidity (e.g., immunocompromise, hepatic failure)
20. Known history of malignancy in the past 5 years (except for low-grade and fully resolved non-melanoma skin cancer)
21. Known allergy to gentamycin and amphotericin
22. Patients receiving other investigational drug or device therapy within 30 days of screening
23. Patients who have received gene therapy
24. Inability ot provide informed consent and comply with the follow-up visit schedule

Date of first enrolment
01/05/2010

Date of final enrolment
15/09/2019

Locations

Countries of recruitment
Canada

Study participating centre
Ottawa Hospital General Campus
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Sponsor information

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Sponsor type
Research organisation

Website
http://www.ohri.ca

ROR
https://ror.org/03c62dg59

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Canadian Stem Cell Network

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Sponsor type
Research organisation

Funder(s)

Funder type
Research organisation

Funder Name
Canadian Institutes of Health Research (ref: MCT-90169)

Alternative Name(s)
Instituts de Recherche en Santé du Canada, Canadian Institutes of Health Research (CIHR), CIHR_IRSC, Canadian Institutes of Health Research | Ottawa ON, CIHR, IRSC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
Canada

Results and Publications

Publication and dissemination plan
Dr Stewart has presented the analysis of the study results to the American Society of Gene and Cell Therapy (ASGCT) at their annual meeting 2021 (virtually) and is preparing his publication of the results which is planned for the near future.

Intention to publish date

Individual participant data (IPD) sharing plan
Current IPD sharing plan as of 07/03/2025:
The datasets generated during and/or analysed during the current study are/will be available upon request from Dr Duncan Stewart (djstewart@toh.ca).
The de-identified raw data and clean data set files are housed in OHRI's securely encrypted password-protected Sharepoint folder system and will be maintained there for at least 15 years following trial completion.
Prior to implementing any requests for data sharing (other than from the REB pre-approved ENACT AMI Study team) that are received and approved by Dr Stewart, a Secondary Use of Information Application will be completed and submitted to the OHSN-REB for approval to share data/files. Each of the participants will be approached with a separate signed consent obtained for permission to share their de-identified data. As required, a Data Sharing Agreement will be signed and executed between Dr Stewart and the requesting party prior to any data being shared with that party.

Previous IPD sharing plan:
The datasets generated during and/or analysed during the current study are/will be available upon request from Dr Duncan Stewart (djstewart@toh.ca).
The de-identified raw data and clean data set files are housed in OHRI's securely encrypted password-protected Sharepoint folder system and will be maintained there for 15 years following trial completion.
Prior to implementing any requests for data sharing (other than from the REB pre-approved ENACT AMI Study team) that are received and approved by Dr Stewart, a Secondary Use of Information Application will be completed and submitted to the OHSN-REB for approval to share data/files. Each of the participants will be approached with a separate signed consent obtained for permission to share their de-identified data. As required, a Data Sharing Agreement will be signed and executed between Dr Stewart and the requesting party prior to any data being shared with that party.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	01/03/2010	11/04/2019	Yes	No