Safety and Efficacy of sonolysis therapy for treatment of microvascular damage after myocardial infarction

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON28497

Source
NTR

Brief title
ROMIUS

Health condition

Myocardial infarction
Hartinfarct

Sponsors and support

Primary sponsor: VU University Medical Center
Source(s) of monetary or material Support: Philips Medical Imaging

Intervention

Outcome measures

Primary outcome

• Echocardiographic and enzymatic infarct size

• Microvascular obstruction and haemorrhage on MRI measurements

Secondary outcome

• Practicality / feasibility problems during imaging

• Other adverse events

• Other Serious adverse events

• Incidence of Major Adverse Cardiac Events (MACE)

Study description

Background summary

Currently, primary percutaneous coronary intervention (PCI) is the treatment of choice in STEMI patients, however, its widespread use is hampered by limited availability of specialized facilities and trained staff. Also, peripheral microvascular obstruction often occurs, as part of the microvascular injury pathway. Therefore, there is a need for simpler and low-risk methods for effective recanalization of thrombosed arteries that can be initiated early in the disease process and after initial primary PCI treatment.

In this respect, the application of ultrasound, and ultrasound in combination with thrombolytic agents have been investigated and were found to enhance thrombus dissolution in vitro and in vivo.

We hypothesize that under influence of ultrasound, UCAs enhance dissolution of thrombus in patients with acute ST-elevation myocardial infarction premedicated with regular treatment with prasugrel, aspirin and heparin followed by bivalirudin and furthermore reduce the amount of microvascular obstruction that occurs after primary PCI.

Study objective

Is application of diagnostic ultrasound and microbubbles prior and immediately after primary PCI to enhance coronary recanalization and reduce microvascular obstruction when combined with normal care consisting of prasugrel, aspirin and heparin followed by bivalirudin a safe and feasible method in this patient group?

Study design

First visit. 6 week follow-up. 6 month follow-up.

Intervention

Patients will be announced by the ambulance. After announcement by the ambulance of a patient with an eligible STEMI the patient will be pre-treated in the ambulance with a loading dose of aspirin 500 mg iv., heparin 5000 IU iv., prasugrel 60mg po.
Upon arrival on the cathlab, after oral informed consent the patient will also receive Definity Microbubbles as part of the immediate ultrasound therapy

To avoid any time delay, informed consent will be obtained orally, prior to primary PCI and bivalirudin infusion. Investigator will try to obtain written informed consent prior to study procedures. In any other case, written informed consent will be given after primary PCI when the patient is in a stable clinical condition.

After informed consent, patients will be treated with ultrasound application with an UCA. To prevent delay of intended clinical treatment, the study procedure is carried out during the preparation for primary PCI as much as possible. The whole study procedure time including preparation is expected to take a maximum of 15 minutes. After PCI, the patient will receive an additional 30 minutes of UCA treatment.

An intravenous line will be inserted, and continuous registration of a 12-lead ECG is obtained. An automatic blood pressure device will record blood pressure every three minutes during the study procedure.

Contacts

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Eligibility criteria

Inclusion criteria

• Age > 18 years

• Acute onset (< 6 hours)

• Diagnosed with STEMI according to the criteria of the ACC

• Initial oral informed consent

Exclusion criteria

• Clinical instability

• Known allergy to ultrasound contrast agents

• Any reason judged by the investigators to hamper inclusion

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	01-09-2014
Enrollment:	20
Type:	Anticipated

Ethics review

Positive opinion

Date:	16-09-2014
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 41625
Bron: ToetsingOnline
Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL4648
NTR-old	NTR4791
CCMO	NL46176.029.14
OMON	NL-OMON41625

Study results

Summary results

1 Daffertshofer M, Gass A, Ringleb P, et al. Transcranial low-frequency ultrasound-mediated thrombolysis in brain ischemia: increased risk of hemorrhage with combined ultrasound and tissue plasminogen activator: results of a phase II clinical trial. Stroke 2005 Jul;36(7):1441-6.
2 Scott PA, Frederiksen SM, Kalbfleisch JD, et al. Safety of intravenous thrombolytic use in four emergency departments without acute stroke teams. Acad Emerg Med 2010 Oct;17(10):1062-71.
3 Kramer C, Aguilar MI, Hoffman-Snyder C, et al. Safety and efficacy of ultrasound-enhanced thrombolysis in the treatment of acute middle cerebral artery infarction: a critically appraised topic. Neurologist 2011 Nov;17(6):346-51.

4 Xie F, Lof J, Matsunaga T, et al. Diagnostic ultrasound combined with glycoprotein IIb/IIIa-targeted microbubbles improves microvascular recovery after acute coronary thrombotic occlusions. Circulation 2009 Mar 17;119(10):1378-85.
5 Gibson CM, Cannon CP, Daley WL, et al. TIMI frame count: a quantitative method of assessing coronary artery flow. Circulation 1996 Mar 1;93(5):879-88.
6 Ndrepepa G, Tiroch K, Keta D, et al. Predictive factors and impact of no reflow after primary percutaneous coronary intervention in patients with acute myocardial infarction. Circ Cardiovasc Interv 2010 Feb 1;3(1):27-33.
7 Kloner RA, Ganote CE, Jennings RB. The "no-reflow" phenomenon after temporary coronary occlusion in the dog. J Clin Invest 1974 Dec;54(6):1496-508.
8 Kondo M, Nakano A, Saito D, et al. Assessment of "microvascular no-reflow phenomenon" using technetium-99m macroaggregated albumin scintigraphy in patients with acute myocardial infarction. J Am Coll Cardiol 1998 Oct;32(4):898-903.
9 Cavalcante JL, Collier P, Plana JC, et al. Two-dimensional longitudinal strain assessment in the presence of myocardial contrast agents is only feasible with speckle-tracking after microbubble destruction. J Am Soc Echocardiogr 2012 Dec;25(12):1309-18.
10 Slikkerveer J, Kleijn SA, Appelman Y, et al. Ultrasound Enhanced Prehospital Thrombolysis Using Microbubbles Infusion in Patients with Acute ST Elevation Myocardial Infarction: Pilot of the Sonolysis Study. Ultrasound Med Biol 2011 Dec 16.