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Endovascular treatment for acute ischemic stroke in the Netherlands

Submission date
03/06/2012

Recruitment status
No longer recruiting

Registration date
24/07/2012

Overall study status
Completed

Last Edited
18/12/2023

Condition category
Circulatory System

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Ischaemic strokes occur when a blood clot blocks the flow of blood to the brain. Intra-arterial thrombolysis and mechanical thrombectomy is a new and promising treatment for patients with acute ischemic stroke. This treatment involves going into the brain arteries with a very small tube (catheter) to deliver treatment at the site of the blocked blood vessel that caused the stroke, reopening the blocked vessels and removing the clot. This study will investigate the effectiveness and safety of this treatment.

Who can participate?
Patients with acute ischemic stroke who admitted to the ER of one of the participating medical centers within 6 hours from onset of symptoms.

What does the study involve?
Participants are randomly allocated to receive either standard treatment for acute ischemic stroke or intra-arterial treatment as described above. Participants then undergo additional MRI or CT scans to check whether the blocked vessel has been reopened. After 1 week, a CT scan is carried out to assess the extent of the stroke. Blood is drawn at this time to look for blood clotting abnormalities. After 3 months, participants are approached by telephone to check on their general condition.

What are the possible benefits and risks of participating?
Those who participate in the study will benefit from high level stroke assessment by experienced stroke neurologists. As the effectiveness of the treatment is not yet proven, the opportunity to receive this treatment cannot be called a benefit. The treatment is probably associated with an increased risk of bleeding inside the skull and at the site of the cather insertion in the groin. Early studies so far suggest that the risks of the treatment are in balance with the expected benefit.

Where is the study run from?
In 14 large hospitals in the Netherlands, listed on the trial website: http://www.mrclean-trial.org/centers.htm

When is the study starting and how long is it expected to run for?
December 2010 to January 2015

Who is funding the study?
The project is funded by the Dutch Heart Foundation, and by several companies, all of whom are listed on the trial website: http://www.mrclean-trial.org/sponsors.htm

Who is the main contact?
Prof. Diederik Dippel and Prof. Charles Majoie
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Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
NTR1804, NL 30557.078.10 v02, NL695

Study information

Scientific Title
Multicenter Randomized CLinical trial of Endovascular treatment for Acute ischemic stroke in the Netherlands

Acronym
MR CLEAN

Study objectives
The primary objective of this study is to estimate the effect of endovascular treatment on overall functional outcome after acute ischemic stroke of less than six hour duration, in patients with a symptomatic intracranial anterior circulation occlusion.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Medical Ethics Committee and Resarch Board of Erasmus MC University Medical Center

Study design
Multicenter randomized open-label treatment and blinded endpoint evaluation (PROBE design)

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Acute ischemic stroke, caused by intracranial proximal arterial occlusion (anterior circulation)

Interventions
Intervention arms consists of endovascular treatment by means of microcatheter guided local application of recombinant tissue plasminogen activator (rt-PA) or urokinase, and/or mechanical thrombectomy, by means of a retraction device, aspiration device, or retrievable stent.

The control arm consists of regular treatment according to current national clinical guidelines.

Intervention Type
Procedure/Surgery

Primary outcome(s)
Score on the modified Rankin scale at 3 months

Key secondary outcome(s))
Imaging parameters:
1. Vessel recanalization at 24 hours after treatment, assessed by CTA or MRA. The criteria for recanalization on CTA or MRA are based on a simplified TICI score (Table 5b),45 and the clot burden score, proposed by Puetz et al (Table 5c)46.
2. Infarct size assessed by CT on day 5-7, using standard methods, including manual tracing of the infarct perimeter and semiautomated pixel thresholding.47, 48 Infarct size at day 5-7 will be compared with plain CT and perfusion CT results (if available) at baseline.
3. CTA or MRA at 24 hours will be compared with baseline vessel imaging data, to estimate the recanalization rate. Perfusion CT at baseline is optional, but available at most centers.

Clinical parameters:
1. NIHSS, including NIH supplemental motor score, 50 at 24 hours
2. NIHSS at 1 week or at discharge.

Functional outcome:
1. Score on the EQ5D at 90 days
2. Barthel index at 90 days

Completion date
01/01/2015

Eligibility

Key inclusion criteria
1. A clinical diagnosis of acute stroke, with a deficit on the National Institutes of Health (NIH) stroke scale of 2 points or more
2. Computerised tomography (CT) or magnetic resonance imaging (MRI) scan ruling out intracranial hemorrhage
3. Intracranial arterial occlusion of the distal intracranial carotid artery or middle (M1/M2) or anterior (A1/A2) cerebral artery, demonstrated with Computed Tomography Angiography (CTA), magnetic resonance angiography (MRA), Digital subtraction angiography (DSA) or transcranial Doppler/duplex (TCD)
4. The possibility to start treatment within 6 hours from onset
5. Informed consent given
6. Age 18 or over

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Key exclusion criteria
General:
1. Arterial blood pressure > 185/110 mmHg
2. Blood glucose < 2.7 or > 22.2 mmol/L
3. Intravenous treatment with thrombolytic therapy in a dose exceeding 0.9 mg/kg alteplase or 90 mg
4. Intravenous treatment with thrombolytic therapy despite contra-indications, i.e. major surgery, gastrointestinal bleeding or urinary tract bleeding within the previous 2 weeks, or arterial puncture at a non-compressible site within the previous 7 days

For Intended mechanical thrombectomy:
Laboratory evidence of coagulation abnormalities, i.e. platelet count <40 x 109/L, activated partial thromboplastin time (APTT)>50 sec or International Normalised Ratio (INR) >3.0.

For intended intra-arterial thrombolysis:
1. Cerebral infarction in the distribution of the relevant occluded artery in the previous 6 weeks
2. History of intracerebral hemorrhage
3. Severe head injury (contusion) in the previous 4 weeks
4. Clinical or laboratory evidence of coagulation abnormalities, i.e. platelet count <90 x 109/L, APTT>50 sec or INR >1.7

Date of first enrolment
01/12/2010

Date of final enrolment
01/01/2015

Locations

Countries of recruitment
Netherlands

Study participating centre
Erasmus MC University Medical Center Rotterdam
Rotterdam
Netherlands
3000CA

Sponsor information

Organisation
Dutch Heart Foundation (Netherlands)

ROR
https://ror.org/05nxhgm70

Funder(s)

Funder type
Charity

Funder Name
Dutch Heart Foundation (Nederlandse Hartstichting) (Netherlands) ref: 2008T030

Alternative Name(s)
Heart Foundation

Funding Body Type
Private sector organisation

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

Location
Netherlands

Results and Publications

Individual participant data (IPD) sharing plan
Not provided at time of registration

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	01/01/2015		Yes	No
Results article	results	01/03/2016		Yes	No
Results article	results	01/06/2016		Yes	No
Results article	results	16/08/2016		Yes	No
Results article	results	01/09/2016		Yes	No
Results article	results	01/10/2016		Yes	No
Results article	results	01/12/2016		Yes	No
Results article	results	06/04/2017		Yes	No
Results article	results	01/05/2017		Yes	No
Results article	results	01/05/2017		Yes	No
Results article	results	20/06/2017		Yes	No
Results article	results	01/07/2017		Yes	No
Results article	results	01/10/2017		Yes	No
Results article	results	01/02/2018		Yes	No
Results article	results	01/02/2018		Yes	No
Results article	results	01/02/2018		Yes	No
Results article	results	01/03/2018		Yes	No
Results article	results	01/04/2018		Yes	No
Results article	results	01/12/2018		Yes	No
	results	01/05			

Results article		/2019		Yes	No
Results article	Multivessel occlusions (MVO)	15/12 /2023	18/12 /2023	Yes	No
Protocol article	protocol	01/09 /2014		Yes	No
Abstract results	Economic evaluation	14/10 /2021	15/10 /2021	No	No
Abstract results	Results abstract European Stroke Organisation Conference 2021	03/09 /2021	29/03 /2023	No	No
Other publications	post hoc analysis	01/12 /2019	12/12 /2019	Yes	No
Other publications	retrospective analysis	08/06 /2022	09/06 /2022	Yes	No
Participant information sheet	Participant information sheet	11/11 /2025	11/11 /2025	No	Yes
Study website	Study website	11/11 /2025	11/11 /2025	No	Yes