ISRCTN93529999 https://doi.org/10.1186/ISRCTN93529999

A randomised trial to establish the effectiveness of intermittent pneumatic compression sleeves (applied to the legs) to prevent post stroke deep vein thrombosis (DVT)

Submission date
26/08/2008

Recruitment status
No longer recruiting

Registration date
09/10/2008

Overall study status
Completed

Last Edited
30/09/2015

Condition category
Circulatory System

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

Plain English summary of protocol

Background and study aims.
Patients who are immobile due to illness are at increased risk of developing blood clots in the veins of their legs. These are called deep vein thrombosis or DVT for short. Although patients may experience pain, swelling and redness of their leg associated with these clots, they may not have any symptoms. However, even if they have no symptoms these DVTs can be very dangerous. The clot may break into pieces and be carried to the lungs and heart (called pulmonary embolism) where they can cause the heart to stop. Some patients die suddenly from pulmonary embolism. Patients who are admitted to hospital with a stroke are at particular risk since they are often immobile. Although blood thinning drugs can help reduce the risk of the clots, their benefits are offset by an increased risk of bleeding complications. The CLOTS 1 trial showed that graduated compression stockings (like fight socks) do not reduce the risk of DVT in stroke patients. The CLOTS 3 trial is testing whether Intermittent Pneumatic Compression (called IPC for short) reduces the risk of DVT, pulmonary embolism and death. IPC involves wrapping inflatable sleeves around the legs. These contain air sacs which are inflated, first around the calf, and then the thigh. The squeezing of the leg increases blood flow in the veins and this may reduce the risk of clots forming. The sleeves are attached to an electric air pump at the bedside via tubing. IPC has been shown to reduce the risk of DVT in patients undergoing surgery, but not in patients with other medical conditions including stroke. The aim of the CLOTS 3 trial is to test whether IPC reduces the risk of DVT in patients who are admitted to hospital with a stroke and who are immobile.

Who can participate?
Patients over 16 years old, who are admitted to one of the 105 participating hospitals in the UK, and who have had a stroke and are immobile can be recruited by their doctors and nurses into the trial.

What does the study involve?
Once the patient, or someone close to them, has consented to participating in the trial, the

patient's details are entered into a computer. The patient is randomly allocated to wear the IPC for up to 30 days, or not. All recruited patients, whether they wear the IPC or not then have ultrasound scans of their legs at one week and four weeks to detect any DVT. The patients are followed up for six months to establish how well they recover. All other treatments are the same in the patients wearing IPC or not.

What are the possible benefits and risks of participating?
The benefits of participating are that the patients have scans which may detect a clot. These can then be treated with anticoagulants. This may reduce the risk of serious complications. Also, patients in the trial benefit from routine follow up at six months which can identify other post stroke problems such as depression and pain. Apart from the inconvenience of participating in the trial the risks are probably small. In theory the IPC could cause skins problems and the tubing might trip the patient up if they try to walk resulting in injuries.

Where is the study run from?
The study is run by a team in the University of Edinburgh, based at the Western General Hospital in Edinburgh, Scotland.

When is the study starting and how long is it expected to run for?
The first patient of the 2876 patients recruited was recruited in December 2008 and the last in September 2012. The follow up was completed in March 2013, and the results will be available in May 2013.

Who is funding the study?
The main funder was the National Institute of Health Research (NIHR) Health Technology Assessment (HTA) board of the UK. The Chief Scientist Office of the Scottish Government funded the start up phase. Covidien supplied the centres with their IPC sleeves and pumps (Kendall™ SCD Express Sequential Compression System). Staff funded by the UK stroke research network ran the trial in the 105 UK centres.

Who is the main contact?
Prof Martin Dennis, Professor of stroke medicine, University of Edinburgh.

Study website
http://www.clotstrial.com

Contact information

Type(s)
Scientific

Contact name
Prof Martin Dennis

Contact details
Bramwell Dott Building
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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number
NCT00789542

Secondary identifying numbers
HTA 08/14/03; Version 2

Study information

Scientific Title
A randomised trial to establish the effectiveness of intermittent pneumatic compression to prevent post stroke deep vein thrombosis (DVT)

Acronym
CLOTS-3

Study objectives
Does early and routine application of intermittent pneumatic compression (IPC) in addition to routine care reduce the risk of above knee deep vein thrombosis (DVT) in the weeks following an acute stroke?

More details can be found at http://www.nets.nihr.ac.uk/projects/hta/081403
Protocol at http://www.nets.nihr.ac.uk/__data/assets/pdf_file/0005/52394/PRO-08-14-03.pdf

Please note that as of 20/05/2010 this record has been updated to reflect changes in the trial protocol from Version 1 to Version 2. Point 3 of the original exclusion criteria has been removed, this and all updates can be found in the relevant field under the above update date. Please also note that this trial has been extended. The overall trial end date has been changed from 30/04 /2013 to 30/09/2014.

On 20/03/2013 the overall trial end date was updated from 30/09/2014 to 31/03/2013.

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. MREC Scotland, 25/09/2008, ref: 08/MRE00/73
2. Additional approval for England and Wales obtained on 26/08/2008, ref: 08/H0906/137

Study design
Multi-centre randomised controlled trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Prevention

Participant information sheet
Information for patients may be found at http://www.dcn.ed.ac.uk/clots/clots_patient_area/index.html

Health condition(s) or problem(s) studied
Stroke

Interventions
Routine care vs routine care plus IPC sleeves. If allocated to the intervention group, thigh length IPC sleeves should be applied to both legs for 30 days.

Intervention Type
Other

Phase
Not Specified

Primary outcome measure
Presence of definite or probable symptomatic or asymptomatic DVT in the popliteal or femoral veins detected on a screening Compression Doppler ultrasound scan or any symptomatic DVT in the popliteal or femoral veins confirmed on Compression Doppler ultrasound, contrast venography or magnetic resonance imaging (MRI) direct thrombus imaging within 30 days of randomisation.

Secondary outcome measures
In hospital:
1. Death within 30 days
2. Presence of definite or probable DVT in the popliteal or femoral veins detected on a screening Compression Doppler ultrasound scan which had not been suspected clinically before the scan (see below)
3. Definite (i.e. excluding probable DVTs) symptomatic or asymptomatic DVT in the popliteal or femoral veins detected on either a Compression Doppler ultrasound scan, contrast venography or MRI direct thrombus imaging within 30 days of randomisation
4. Any definite or probable symptomatic or asymptomatic DVT (i.e. including DVTs which only involve the calf veins)
5. Confirmed fatal or non-fatal pulmonary embolism (PE)
6. Adherence to allocated treatment

At 6 months:
7. Death from any cause
8. Any confirmed symptomatic or asymptomatic DVT or PE occurring between randomisation and final follow up
9. Any symptomatic DVT or PE occurring between randomisation and final follow up
10. Place of residence
11. Post DVT syndrome
12. Disability (modified Rankin)
13. Health related quality of life (EuroQol). The later effects of DVT/PE (e.g., breathlessness, leg pain or swelling, poor stroke recovery) or the adverse events related to IPC (falls with injury, fractures, skin ulceration, amputation, loss of mobility) may be diverse, so it seems sensible to include a measure of overall health related quality of life.

Overall study start date
01/12/2008

Completion date
31/03/2013

Eligibility

Key inclusion criteria
1. Patients (both males and females) who were admitted to hospital within 3 days of a clinical stroke fulfilling the World Health Organization (WHO) criteria
2. Those who are not able to get up from a chair/out of bed and walk to the toilet without the help of another person

Participant type(s)
Patient

Age group
Adult

Sex
Both

Target number of participants
2,000

Key exclusion criteria
Current information as of 20/05/2010:
1. Patients with stroke due to subarachnoid haemorrhage
2. Patients who, in the opinion of the responsible clinician/nurse, are unlikely to benefit from IPC
3. Patients with contraindications for the use of IPC
4. Patients who already have swelling or other signs of an existing DVT. Such patients may be recruited once a DVT has been excluded by normal D Dimers or Compression Doppler ultrasound.
5. Patients under 16 years of age

Initial information at time of registration:
1. Patients with stroke due to subarachnoid haemorrhage

2. Patients who, in the opinion of the responsible clinician/nurse, are unlikely to benefit from IPC
3. Patients who are anticoagulated (taking warfarin, unfractionated heparin, low molecular weight heparin or direct thrombin inhibitors) at the time of enrolment in whom it is planned to continue the anticoagulation throughout the first week or two after the stroke
4. Patients with contraindications for the use of IPC
5. Patients who already have swelling or other signs of an existing DVT. Such patients may be recruited once a DVT has been excluded by normal D Dimers or Compression Doppler ultrasound.
6. Patients under 16 years of age

Date of first enrolment
01/12/2008

Date of final enrolment
01/09/2012

Locations

Countries of recruitment
Scotland

United Kingdom

Study participating centre
Western General Hospital
Edinburgh
United Kingdom
EH4 2XU

Study participating centre
105 participating hospitals
United Kingdom
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Sponsor information

Organisation
University of Edinburgh (UK)

Sponsor details
Edinburgh Clinical Trials Unit
Queens Medical Research Institute
47 Little France Crescent
Edinburgh

Scotland
United Kingdom
EH16 4TJ

Sponsor type
University/education

Website
http://www.ed.ac.uk

Organisation
Lothian NHS Board (UK)

Sponsor details
Deaconess House
148 Pleasance
Edinburgh
Scotland
United Kingdom
EH8 9RS

Sponsor type
Hospital/treatment centre

Website
http://www.nhslothian.scot.nhs.uk

Organisation
University of Edinburgh

Sponsor details

Sponsor type
Not defined

Website
http://www.ed.ac.uk/home

ROR
https://ror.org/01nrxwf90

Funder(s)

Funder type
Government

Funder Name
Chief Scientist Office (UK) (ref: CZG\2\378)

Alternative Name(s)
CSO

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
United Kingdom

Funder Name
Added 20/05/10:

Funder Name
NIHR Health Technology Assessment Programme - HTA (UK) (ref: 08/14/03)

Results and Publications

Publication and dissemination plan
Not provided at time of registration

Intention to publish date

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?
Protocol article	protocol	08/03/2012		Yes	No
Statistical Analysis Plan	statistical analysis plan	06/03/2013		No	No
Results article	results	10/08/2013		Yes	No
	results				

Results article	01/09/2015	Yes	No