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Perineural local anaesthetic catheter after major lower limb amputation feasibility trial

Submission date
20/10/2016

Recruitment status
No longer recruiting

Registration date
21/10/2016

Overall study status
Completed

Last Edited
19/11/2025

Condition category
Circulatory System

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

Plain English summary of protocol

Background and study aims
All patients undergoing an amputation get some pain after the surgery and require analgesia (pain killers) to reduce this. Controlling pain in the short term is essential to recovery immediately after the operation, especially with regards to moving out of bed with the physiotherapists. Evidence also suggests that the amount of pain an amputee experiences in the first few days after their operation can affect the amount of longer term pain and “phantom limb” pain they get. Good pain control is therefore essential to every patient. The current “gold standard” is to provide morphine based pain killers, either by mouth or through a drip to ensure comfort after the operation. Sometimes an epidural (injection in the back) is given by the anaesthetists at the time of the operation to ease pain shortly after the procedure. This is current practice in the majority of surgical units across the UK and has been for many years. Every patient having an amputation will be reviewed by doctors and specialist nurses to ensure the correct levels of morphine and other pain killers (such as paracetamol or special medications used to reduced nerve pain) are provided. Morphine provides excellent pain relief to patients with intense pain. It does, however, have side effects including confusion, constipation, nausea and itching. It also interacts with many different medications. Morphine, although a good pain killer, can cause problems which lead to longer recovery time and having to spend longer in hospital. This study involves looking at a method of providing pain control after a patient undergoes a leg amputation. A local anaesthetic is a drug which has been used safely for many years in hospitals and at the dentist. It is usually injected under the skin, numbing the area. This then allows the doctor or dentist to perform minor procedures, such as removing a small mole on the skin, or taking out a tooth. Smaller studies have suggested that a local anaesthetic catheter is helpful in reducing pain and the amount of morphine required by each patient. Reducing morphine use can reduce the number of side effects and improve a patient’s recovery.

Who can participate?
Patients aged at least 18 about to have a amputation of a lower limb (foot or leg)

What does the study involve?
Patients are randomly allocated to one of two groups. Those in group 1 receive the local anaesthetic catheter. Those in group 2 receive normal care. Most of the treatment received is the same for both groups. However, patients who are randomised to receive the local

anaesthetic catheter have it placed at the time of the operation (whilst they are under anaesthetic). As part of the amputation the surgeon needs to cut the main nerve in the leg. When he or she is doing this they are able to place the catheter alongside the nerve inside the leg. The catheter tube is then brought out through the skin at a point away from the wound. The catheter remains in place with an infusion (constant slow stream) of a local anaesthetic for the first five days after the amputation. The catheter is normally removed at the end of day five after the amputation. The removal is a painless process which can be performed on the ward by the ward nurse. After the surgery, usual care is provided to all patients undergoing an amputation. When back on the ward the nursing staff keep a close eye on basic observations and patients are asked to rate levels of pain and record this (this is normal practice for all post-operative patients). All patients receive as much morphine and other types of pain killers they need to remain comfortable. This is recorded by the nurses as routine, but the information is also used to see if the local anaesthetic treatment works. A member of the research team comes to see patients every day for the first 5 days after the operation and ask some additional questions about how well pain is controlled and about side effects associated with morphine.In addition to the normal follow up patients receive from the hospital 6 weeks after the operation, patients are contacted, normally via telephone, around 6 months after their amputation. At both usual 6 week follow-up appointment and at 6 months, participants are asked about any symptoms of pain the patient may be experiencing in the long term and go through some questionnaires. Researchers want to know about any pain medications they are taking at that point (their GP are also asked so it is not essential for the patient to remember). This should take around half an hour. We would also look at the patients' medical records so that information on healthcare costs such as prescriptions, visits to the GP and so on can be collected. A few of the participants are asked by a member of the research team to discuss their experiences of taking part and about their health as part of an additional study.

What are the possible benefits and risks of participating?
If the treatment works, pain will be reduced, leading to a reduction in morphine use and its side effects, which could improve recovery. In addition, participants will be helping to answer questions about the treatment of lower limb amputation that should result in better care for patients needing this in the future. Taking part in the trial will mean that participants will have to give up some of their time. Side effects of local anaesthetics are rare. The majority of patients do not have any problems with them. Allergies to them can occur but are rare, occurring in less than one in every thousand patients. This can cause a reaction in the skin injected with it, causing redness and swelling, or in very rare cases more severe reactions. Giving too much local anaesthetic can cause problems to the heart which trigger a high heart rate and low blood pressure. This happens mainly when a large amount of local anaesthetic is injected all at the same time, and can be avoided by giving a slow infusion and providing the patient with a dose based on how much they weigh. There have been very few reported problems with local anaesthetic catheters. Although uncommon, there is a chance that patients may get an infection caused by the catheter. This can cause cellulitis (redness and heat in the top layer of the skin) around the catheter. This can be treated by giving antibiotics either by mouth or through a drip (intravenous infusion).

Where is the study run from?
Royal Gwent Hospital and Morriston Hospital (UK)

When is the study starting and how long is it expected to run for?
October 2016 to October 2018

Who is funding the study?
Research for Patient and Public Benefit (UK)

Who is the main contact?
Mr Christopher Twine

Contact information

Type(s)
Scientific

Contact name
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Clinical Trials Information System (CTIS)
2016-003544-37

Protocol serial number
ABUHB/01/0816/1

Study information

Scientific Title
Perineural Local Anaesthetic Catheter aftEr Major lowEr limb amputatioN Trial: a phase II randomised controlled feasibility study

Acronym
PLACEMENT

Study objectives
Infusion of local anaesthetic around the sciatic or tibial nerve after major lower limb amputation significantly improves pain control

Ethics approval required
Old ethics approval format

Ethics approval(s)
Wales Research Ethics Committee 3, 21/11/2016, ref: 16/WA/0353

Primary study design

Interventional

Study design
Randomised controlled open-label study

Study type(s)
Quality of life

Health condition(s) or problem(s) studied
Major lower limb amputation

Interventions
All patients recruited into the study have been scheduled to receive either an above knee or below knee amputation for complications of peripheral vascular disease. The treatment arm will receive a perineural catheter (PNC), placed adjacent to the sciatic nerve for above knee amputations or adjacent to the tibial nerve for below knee amputations. 0.125% levobupivacaine hydrochloride will be administered via this PNC for the first five postoperative days, in addition to usual care. The control arm will receive usual care.

Placement of a PNC takes approximately 5-10 minutes, and requires no further dissection over and above what is already undertaken for lower limb amputations. Intra-operatively, the sciatic nerve (for AKA) or tibial nerve (for BKA) is identified. The nerve is transected sharply under gentle tension, to allow the cut end of the nerve to retract away from the wound in order to reduce the incidence of neuroma formation, as is standard surgical practice. An epidural catheter (20G, 0.85mm diameter) is used as the PNC, and placed in the perineural space after the limb has been removed. Epidural catheter packs come with a Tuohy needle; a non-coring needle with a slight curve at its tip which causes a catheter passed through the needle to exit at approximately 45 degrees which is used to place the catheter in the correct location. The Tuohy needle is first placed in the perineural space, the fenestrated end of the epidural catheter advanced along the needle so to lie adjacent to the nerve, approximately 10cm cranial from the cut end, and the needle withdrawn leaving the catheter in place. A suitable exit site for the catheter on the lateral aspect of the amputation stump is selected, and the Tuohy needle passed through the skin (external to internal) at this point. The free end of the epidural catheter is then passed through the needle, which is then withdrawn to leave the catheter exiting the wound. The amputation is completed and the epidural catheter secured (if required) with a silk suture or dressing. The epidural infusion system is then connected to the end of the catheter, is typically flushed with 10ml of 0.25% Levobupivacaine hydrochloride as a loading dose, and is then ready for connection to the local anaesthetic infusion device.

Intervention Type
Drug

Phase
Phase II

Drug/device/biological/vaccine name(s)
0.125% levobupivacaine hydrochloride

Primary outcome(s)
Pain experienced over the first 5 days after surgery, as assessed using a Verbal Rating Scale (VRS), which will be captured 3 times a day

Key secondary outcome(s)
1. Pain, assessed by the Overall Benefit of Analgesia Score (OBAS) pre-operatively and once daily post-operatively for five days
2. Pain, assessed by the Self-completed Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) pre-operatively and on postoperative day five
3. Opioid use, measured pre-operatively and once daily postoperatively for five days, converted to morphine equivalents using the University of Alberta Multidisciplinary Pain Centre Opioid Conversion Guide
4. Pain, assessed by OBAS, S-LANSS and the Modified Groningen Phantom Limb Pain questionnaire at six week and six month follow-up
5. Quality of life, assessed pre-operatively and at 6 week and 6 month follow-up using EQ-5D and HADS.
6. Surgical site infection rates, classified as per the 2008 CDC/NHSN document
7. Rate of successful identification of the nerve and successful placement of the PNC (the latter in the intervention group only)
8. Assessment of resource usage during the first 6 months postoperatively

Completion date
31/12/2018

Eligibility

Key inclusion criteria
1. Patients aged 18 years or older
2. Undergoing elective or emergency major lower limb amputations (BKA, or AKA) for complications of PVD
3. Able to assess pain using a VRS
4. Those with a life expectancy of greater than two weeks
5. (For women of childbearing potential) willing to undergo a pregnancy test before the trial and agree to either use a highly effective method of contraception or abstain from sexual intercourse until at least seven days after their amputation

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
99 Years

Sex
All

Total final enrolment
50

Key exclusion criteria
1. Patients undergoing digital, metatarsal, tarsal amputation, disarticulation of the hip or hindquarter amputation
2. Patients undergoing simultaneous bilateral amputations
3. Patients undergoing through knee amputation (TKA)
4. Patients who are unable to provide consent due to incapacity (as defined by Mental Capacity Act 2005)
5. Vulnerable or protected adults
6. Patients with an allergy or intolerance to any of the substances in the PNC, or local anaesthetic agents, or chronically taking class IB anti-arrhythmic agents or local anaesthetic agents, for example in the form of transdermal patches.
7. Pregnant females
8. Patients expected to be managed in the intensive care unit (ICU) postoperatively and be sedated for more than 24 hours
9. Patients undergoing a subsequent amputation who have already been enrolled to participate in the PLACEMENT trial

Date of first enrolment
01/01/2017

Date of final enrolment
30/06/2018

Locations

Countries of recruitment
United Kingdom

Wales

Study participating centre
Royal Gwent Hospital
Cardiff Road
Newport
Wales
NP20 2UB

Study participating centre
Morriston Hospital
Heol Maes Eglwys, Morriston
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SA6 6NL

Sponsor information

Organisation
Aneurin Bevan University Health Board

ROR
https://ror.org/045gxp391

Funder(s)

Funder type
Government

Funder Name
Research for Patient and Public Benefit (Wales)

Results and Publications

Individual participant data (IPD) sharing plan
Current IPD sharing statement as of 06/02/2023:
The datasets generated during the current study are available upon request from the Centre for Trials Research, Cardiff University by contacting the study manager at PLACEMENT-Trial@cardiff.ac.uk. Pseudo-anonymised data will be provided upon production of the requestor's study protocol and agreement by the Centre of Trials Research and study sponsor (Aneurin Bevan University Health Board).

Previous IPD sharing statement:
The datasets generated during the study will be available upon request from opendata@cardiff.ac.uk at the end of the study. The aim is to make the research data available wherever possible, subject to regulatory approvals, any terms and conditions from external providers, patient confidentiality and all laws concerning the protection of personal information. Data is generally freely available, but recipients are expected to acknowledge the original creators in any public use of the data or in publishing research results based wholly or in part upon the data – anyone requesting access to data will be asked to agree to the terms of the Creative Commons Attribution 4.0 license. The trialists may ask the requestor to cover reasonable costs for preparing and providing the data (for example physical storage and postage, where dataset size makes it impractical to provide data by electronic means).

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	11/11/2019	04/12/2019	Yes	No
Protocol article	protocol	28/12/2017		Yes	No
HRA research summary			28/06/2023	No	No
Other publications	Rehabilitation experiences following major lower limb amputation due to complications of vascular disease: a UK qualitative study	15/04/2024	17/04/2024	Yes	No
Other publications	Exploring patients' experiences of analgesia after major lower limb amputation: a qualitative study	01/12/2021	19/11/2025	Yes	No