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Platelet function in patients undergoing major, non-cardiac, vascular surgery

Submission date
25/03/2022

Recruitment status
No longer recruiting

Registration date
14/04/2022

Overall study status
Completed

Last Edited
11/09/2023

Condition category
Surgery

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[_] Record updated in last year

Plain English summary of protocol

Background and study aims
Many patients who require major operations on the blood vessels (vascular surgery) are taking antiplatelet medications. On the day of surgery, they may require an epidural for pain relief. An epidural is an injection in the back that blocks the nerves carrying pain from the area being operated on. It is generally a safe procedure that provides excellent pain relief. One rare risk is bleeding into the injection site, which can have potentially devastating complications such as paralysis. Bleeding into the epidural injection site is estimated to occur in 1 in every 150,000 cases. The risk is thought to be higher in patients who are on antiplatelet medications and therefore guidelines recommend stopping some antiplatelet medications for between 5 and 7 days before an epidural injection. However, this is not based on high-quality research and stopping these medications, even for a brief period, can result in patients being at higher risk of stroke or heart attack. However, little is known about how individual people respond to these medications. Some research suggests that antiplatelet medications may not work in a third of patients. Epidural analgesia may be a suitable option for these patients. Expert committees have called for more research on identifying these patients. The aim of this study is to better understand the true effects that antiplatelet medication has on circulating platelets in the blood.

Who can participate?
Patients aged 18 years and over who are scheduled to undergo major vascular surgery at the John Radcliffe Hospital, Oxford

What does the study involve?
The researchers will require two to three teaspoons of blood from the participants. This blood would be taken during routine pre-operative assessment clinic visits and again on the day of surgery. No drugs will be given as part of the study and the remainder of the study data will be collected from routine healthcare records.

What are the possible benefits and risks of participating?
Participants may not directly benefit from this study but the information and knowledge gained from this study has the potential to help future patients who will undergo vascular surgery.

Taking the blood samples may cause some discomfort, bruising of very minor bleeding. If this happens, it can easily be treated by applying pressure on the site where blood was taken from and taking simple painkillers if required.

Where is the study run from?
John Radcliffe Hospital (UK)

When is the study starting and how long is it expected to run for?
September 2020 to June 2023

Who is funding the study?
National Institute of Academic Anaesthesia (NIAA) (UK)

Who is the main contact?
Dr Akshay Shah.
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Contact information

Type(s)
Principal investigator

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Additional identifiers

Integrated Research Application System (IRAS)
302883

Central Portfolio Management System (CPMS)
51033

Study information

Scientific Title

PLatelet fUnction in patients undergoinG major, non-cardiac, vascular Surgery (PLUGS) – a prospective cohort study

Acronym
PLUGS

Study objectives
To characterise platelet function, using the TEG6S assay, in patients scheduled to undergo elective major, non-cardiac vascular surgery.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 20/12/2021, West Midlands - Solihull Research Ethics Committee (West Midlands - Solihull Research Ethics Committee, Equinox House, City Link, Nottingham, NG2 4LA, UK; +44 (0) 207 104 8191, +44 (0)207 104 8310; solihull.rec@hra.nhs.uk), ref: 21/WM/0254

Primary study design
Observational

Study design
Prospective observational cohort study

Study type(s)
Other

Health condition(s) or problem(s) studied
Participants scheduled to undergo elective, major non-cardiac, vascular surgery

Interventions
The aim of this study is to better understand the true effects that antiplatelet medication has on circulating platelets in the blood. The researchers will use novel methods of analysing platelet function. They will aim to recruit 80 patient participants across four study groups who are scheduled to undergo major vascular surgery at the John Radcliffe Hospital, Oxford and who are taking:
1. Aspirin only
2. Clopidogrel only
3. Dual antiplatelets
4. No antiplatelets (control group)

There is a growing body of evidence evaluating the relationship between measured platelet function and bleeding in patients on clopidogrel, or similar agents undergoing non-cardiac surgery. However, patient compliance with antiplatelet therapy was not reported in these studies. The gold standard method of assessing platelet function is light transmission aggregometry, but this is a time-consuming, labour-intensive method and requires a large volume of blood in comparison with other methods. Thromboelastography 6S (TEG6S) provides near-patient, real-time information on the viscoelastic properties of clot formation, along with information on platelet mapping and percentage inhibition, and has been approved for clinical use.

TEG6 assays will be run in accordance with the manufacturer's guidelines by a trained member of the research team in the operating theatres of the John Radcliffe Hospital, OUHFT. These will be run within 20-40 minutes of being taken. They will require two to three teaspoons of blood from patients who have agreed to take part. This blood would be taken during routine pre-operative assessment clinic visits and again on the day of surgery. No drugs will be given as part of the study and the remainder of the study data will be collected from routine healthcare records.

Intervention Type
Other

Primary outcome(s)
1. Percentage of patients with antiplatelet drug resistance at initial presentation to the Pre-operative Assessment Clinic and on the morning of surgery. For aspirin group (i), drug resistance will be defined as an arachidonic acid (AA)-induced platelet-fibrin clot strength (MAAA) >47 mm plus an AA-induced platelet inhibition rate < 50%. For P2Y12 inhibitors (clopidogrel) group (ii), drug resistance will be defined as an adenosine diphosphate (ADP)-induced platelet-fibrin clot strength (MAADP) >47 mm plus an ADP-induced platelet inhibition rate < 50%
2. Percentage of patients with platelet inhibition measured using the TEG6S assay on the morning of surgery

Key secondary outcome(s)
1. Proportion of patients who self-report as being compliant with antiplatelet medications preoperatively. Compliance will be defined as taking >80% of prescribed doses as prescribed.
2. Peri-operative blood loss, changes in haemoglobin concentration and transfusion requirements measured using routine healthcare records in the first 24 hours in the first 24 hours
3. Return to theatre for bleeding in the first 24 hours and/or graft/stent thrombosis measured using routine healthcare records in the first 24 hours
4. Peri-operative thrombotic events measured using routine healthcare records within 30 days of surgery
5. Bleeding complications associated with regional anaesthesia measured using routine healthcare records at 30 days
6. Days-alive-and-out-of-hospital at 30 days (DAOH-30) measured using routine healthcare records

Completion date
30/06/2023

Eligibility

Key inclusion criteria
1. Participant is willing and able to give informed consent for participation in the study
2. Aged 18 years or above
3. Scheduled to undergo major non-cardiac vascular surgery (including, but not restricted to, abdominal aortic aneurysm (open or endovascular), carotid endarterectomy, lower limb arterial revascularisation)
4. For participants taking antiplatelet therapy: (i) aspirin alone, (ii) clopidogrel alone or (iii) dual antiplatelet therapy groups, at least 7 days of prescribed antiplatelet therapy prior to study

recruitment. Patients who are on other antiplatelet therapy, but from the same therapeutic class as either aspirin or clopidogrel, will be allocated to that particular group.
5. Participants in the control group (iv) should not have been on any antiplatelet therapy

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Upper age limit
110 Years

Sex
All

Key exclusion criteria
1. Congenital/inherited bleeding disorders
2. Haemodialysis-dependent chronic kidney disease
3. Enrolled into a study where an intervention may affect platelet function – this would be discussed on a case-by-case basis between the study Chief Investigators

Date of first enrolment
09/06/2022

Date of final enrolment
15/05/2023

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
John Radcliffe Hospital
Headley Way
Headington
Oxford
United Kingdom
OX3 9DU

Sponsor information

Organisation
University of Oxford

ROR
https://ror.org/052gg0110

Funder(s)

Funder type
Government

Funder Name
National Institute of Academic Anaesthesia

Alternative Name(s)
NIAA

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The data-sharing plans for the current study are unknown and will be made available at a later date

IPD sharing plan summary
Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
HRA research summary			28/06/2023	No	No
Protocol file	version 4.0	08/02/2023	11/09/2023	No	No