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Organ dysfunction after emergency abdominal surgery

Submission date
01/02/2015

Recruitment status
No longer recruiting

Registration date
09/03/2015

Overall study status
Completed

Last Edited
06/06/2018

Condition category
Surgery

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

Plain English summary of protocol

Background and study aims
Patients aged 50 years and over have been shown to be at higher risk of complications and death after emergency abdominal surgery. These complications are not always predictable and it is difficult therefore to ensure that more intensive postoperative management is directed at those patients at highest risk. We know that standard measures such as blood pressure and heart rate do not correlate well with changes at in blood flow at the organ level and profiling patient risk primarily on the basis of these measures is likely to miss patients who are at increased risk. The integrity of the specialised lining of the blood vessels is critical to preventing both the abnormal leakage of fluid out of blood vessels and into the tissues and the exposure of the cells lining the vessels (the endothelial cells) to circulating white blood cells and platelets. Interaction of white blood cells and platelets with exposed endothelial cells leads to formation of clots in the small vessels inside organs, and this in turn contributes to a cascade of inflammation affecting many organ systems. Functionally the protective lining of blood vessels is composed of these endothelial cells along with a highly specialised overlying layer called the endothelial glycocalyx. This layer is made up of proteins and acts as a store for circulating proteins involved in clotting and inflammation. It also helps blood vessels respond to the stresses and strains cause by pulsatile blood flow. Recent work has demonstrated the importance of the integrity of this layer, and has determined that damage to the layer can occur in many clinical settings. The molecules that make up the endothelial glycocalyx are normally well bound within it and thus are not present at all, or are present at very low levels, in the blood. Detection of these substances at increased levels in the blood has been shown to correlate with loss, or “shedding” of the glycocalyx, and testing for these substances in blood is a surrogate marker for damage to the endothelial glycocalyx. The degree to which this damage occurs can be reflected by the level of these substances in blood, and by their persistence over time (reflecting ongoing damage). There are a number of these substances but a commonly measured and validated marker is called syndecan-1. These biomarkers provide us with a measure of the integrity of the vascular barrier in response to a number of insults, several of which are common in patients undergoing emergency abdominal surgery. We aim to investigate the relationship between damage to the protective glycocalyx and the development of complications after surgery, organ impairment, or death. If it is shown that these biomarkers

correlate with risk of postoperative complications then they will be clinically valuable because they will allow doctors to focus additional resources towards these high risk patients and help to detect and treat problems at an earlier stage.

Who can participate?
Adults aged at least 50, admitted to Craigavon Area Hospital and undergoing non-scheduled (urgent or emergent) abdominal surgery through a midline laparotomy incision.

What does the study involve?
Data will be collected on each patients demographics (age, gender, occupation etc), details of surgery, organ support requirements, critical care support, lengths of stay, pre-specified complications along with severity, hospital mortality and 90-day all-cause mortality. Blood samples are taken from participants after surgery and analysed for biomarkers associated with a higher risk of complications after surgery.

What are the possible benefits and risks of participating?
There are no patient specific benefits for participants as they will receive standard care at the discretion of their surgeon, benefits being directed towards the patient population of which these patients are representative. There are no risks other than those normally associated with venepuncture.

Where is the study run from?
Craigavon Area Hospital (UK)

When is the study starting and how long is it expected to run for?
February 2015 to May 2015

Who is funding the study?
Southern Health and Social Care Trust R&D Discretionary Fund (UK)

Who is the main contact?
Mrs Laura Espie (public)
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Dr Andrew Ferguson (scientific)

Contact information

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Public

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
Office for Research Ethics Committees Northern Ireland, ref:14/NI/0028

Study information

Scientific Title
ORgan Dysfunction and Endothelial glycocalyx shedding after emergency AbdominaL Surgery

Acronym
ORDEALS

Study objectives
Patients aged 50 years and over suffer a higher risk of postoperative organ failure, complications, and death compared to similar patients undergoing elective abdominal surgery. It is not easy to identify those patients who will go on to suffer complications, organ failure, or death using conventional clinical measures available at the time of presentation. Outcome is likely to be impacted by both baseline disease and the inflammatory effects of the condition requiring surgery. The vascular endothelial glycocalyx is an essential component of vascular barrier integrity. Conditions such as sepsis are capable of triggering shedding of this barrier. Endothelial activation is associated with leukocyte adhesion and reductions in organ blood flow. The angiopoietin system is involved in the regulation of endothelial quiescence. We hypothesise

that the degree of endothelial glycocalyx shedding and disruption of the angiopoietin system will be greater at the time of emergency operation in those patients who are at highest risk and go on to develop complications or death after emergency abdominal surgery.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Office for Research Ethics Committees Northern Ireland (ORECNI), 24/03/2014, ref: 14/NI/0028

Study design
Single-centre observational study

Primary study design
Observational

Secondary study design

Study setting(s)
Hospital

Study type(s)
Diagnostic

Participant information sheet
Not available in web format, please use contact details to request patient information sheet

Health condition(s) or problem(s) studied
Emergency abdominal surgery through midline laparotomy in patients aged 50 years and over

Interventions
Following enrollment, data will be collected on patient demographics, operative details, organ support requirements, critical care support, lengths of stay, pre-specified complications along with severity, hospital mortality and 90-day all-cause mortality. Blood samples will be taken from participants at the completion of surgery and the serum separated and stored at -80C until processed in duplicate. Syndecan-1, angiopoietin-1 and angiopoietin-2 levels will be measured using commercial ELISA kits. NT-pro-BNP will be measured in the hospital laboratory,

Intervention Type
Other

Primary outcome measure
All-cause mortality at 90 days following surgery

Secondary outcome measures
1. Length of hospital stay (up to point when judged medically fit for discharge)
2. Number of organ failures (SOFA score)
3. Major adverse cardiac events (pre-specified)
4. Postoperative complications (number and severity using standardised Clavien-Dindo classification)
5. Requirement for postoperative critical care

6. Duration of critical care support
7. Individual organ support days
8. Need for reoperation within 30 days
9. Time from surgery to death

Overall study start date
16/02/2015

Completion date
30/05/2016

Eligibility

Key inclusion criteria
1. Aged 50 years or over
2. Admitted to Craigavon Area Hospital
3. Undergoing non-scheduled (urgent or emergent) abdominal surgery through a midline laparotomy incision

Participant type(s)
Patient

Age group
Adult

Sex
Both

Target number of participants
106

Key exclusion criteria
1. Pregnancy
2. Unlikely to survive more than 24 hours irrespective of treatment
3. Ruptured abdominal aortic aneurysm
4. Laparotomy for penetrating abdominal trauma

Date of first enrolment
16/02/2015

Date of final enrolment
16/02/2015

Locations

Countries of recruitment
Northern Ireland

United Kingdom

Study participating centre
Craigavon Area Hospital
68 Lurgan Road
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Sponsor information

Organisation
Southern Health and Social Care Trust

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Sponsor type
Hospital/treatment centre

ROR
https://ror.org/02fjtnt35

Funder(s)

Funder type
Government

Funder Name
Southern Health and Social Care Trust R&D Discretionary Fund (UK)

Results and Publications

Publication and dissemination plan

To be confirmed at a later date

Intention to publish date

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
HRA research summary			28/06/2023	No	No