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Investigating blood clotting changes in patients with COVID-19

Submission date	Recruitment status	[_] Prospectively registered
11/05/2020	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
22/05/2020	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
13/07/2021	Circulatory System	

Plain English summary of protocol

Background and study aims
Infection rates with COVID-19 have risen rapidly across the UK. In patients admitted to hospital with this infection, doctors are noticing unusual abnormalities in blood test results, especially those that measure blood clotting. This is particularly marked in patients with the most severe COVID-19 infection who need to be put on a ventilator in an intensive care unit (ICU). Early studies from China and other European countries also highlighted these clotting abnormalities. It seems that small clots develop in the lungs and sometimes in the kidneys and this can cause these organs to fail. Larger clots can also develop, such as those found in the large blood vessels of the lung (pulmonary emboli, PE) and legs (deep vein thrombosis, DVT). The pattern of clots seen with COVID-19 infection is highly unusual and needs further investigation.
The researchers would like to study the changes to clotting tests (and other blood tests) in all patients admitted to hospital with COVID-19, and to compare the test results seen in patients who require intensive care treatment to those with milder illness. They are particularly interested in whether patients with COVID-19 infection have a higher than normal risk of developing blood clots (both large and small types of clot). The results will be used to understand whether basic blood tests can predict the likelihood that a patient will require intensive care or that they will develop small clots and/or large clots. The tests also might predict the likelihood that a patient with COVID-19 will develop a blood clot while in hospital or after being sent home and whether treatments that have been given as routine care are associated with a reduced risk of clots. Overall, the researchers aim to use these results to understand whether there should be new clot prevention strategies (e.g. higher doses of clot prevention treatments) for all or some of patients with COVID-19.

Who can participate?
Adults admitted to Oxford hospitals with COVID-19

What does the study involve?
This is an observational study, which means that all participants will receive treatment and care as usual. Additional information will be collected on blood clotting and whether participants experience problems related to blood clots while in hospital and in the 90 days after they have been discharged from hospital.

What are the possible benefits and risks of participating?
All participants will receive treatment and care as usual. There are no additional risks of participating.

Where is the study run from?
Oxford University Hospitals NHS Trust

When is the study starting and how long is it expected to run for?
March 2020 to November 2020

Who is funding the study?
The investigators are funding the study.

Who is the main contact?
Dr Nicola Curry, haemophilia.reception@ouh.nhs.uk

Contact information

Type(s)
Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

Integrated Research Application System (IRAS)
282457

Protocol serial number
14937, IRAS 282457

Study information

Scientific Title
An observational study to evaluate the haematological changes caused by COVID-19 and their association with thrombotic clinical outcomes

Study objectives
To describe the prevalence and longitudinal changes to coagulation, platelet and haematological parameters in patients with COVID-19 who present for emergency assessment and may require admission to adult critical and other wards and their relationship to routine blood tests.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 06/05/2020, London - London Bridge Research Ethics Committee (Skipton House, 80 London Road, London SE1 6LH; +44 (0)207 104 8029; londonbridge.rec@hra.nhs.uk), ref: 20/HRA /2304

Study design
Observational study

Primary study design
Observational

Study type(s)
Other

Health condition(s) or problem(s) studied
Thrombosis in patients with COVID-19 (SARS-CoV-2 infection)

Interventions
This observational study will collate data on the longitudinal changes seen in clotting test results and correlate these with clinical thrombotic outcomes. It will focus on the rates of venous and arterial thrombosis seen during in-patient stays and will also collect data around venous thrombosis occurring in the 90 days following patient discharge. These data will provide high quality data around the incidence of thrombosis in this patient group and will inform practice change for VTE prevention.

Intervention Type
Other

Primary outcome(s)
1. Coagulation parameters (PT, aPTT, fibrinogen, D-dimer) measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
2. Blood clotting capability measured by thromboelastography (TEG) using a TEG 5000 machine in whole blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
3. Full blood count (FBC) results (platelet count, haemoglobin, white cell count [WCC] and differential) measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
4. Presence of venous thrombosis defined as radiological confirmed evidence of DVT by compression ultrasound or PE by CT pulmonary angiogram (CTPA) or ventilation/perfusion (VQ)

scan from date of admission to 90 days following discharge
5. Presence of arterial thrombosis defined as ECG evidence of a myocardial infarction or CT/MRI evidence of an ischaemic stroke during hospital admission

Key secondary outcome(s))
1. Aspartate transaminase (AST) measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
2. Ferritin measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
3. Troponin measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
4. C-reactive protein (CRP) measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
5. Bilirubin measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
6. Lactate dehydrogenase (LDH) measured using standard hospital laboratory methods in blood taken on days 1, 2, 3, 7, 14, 21 and 28 during hospital stay
7. Co-morbid conditions assessed using patient electronic medical records from admission data
8. Transfusion need assessed using patient electronic medical records during the in-patient stay
9. ISTH bleeding score assessed using using patient electronic medical records during the in-patient stay
10. Presence of multiple organ failure (MOF) assessed using using patient electronic medical records during the in-patient stay
11. Presence of acute respiratory distress syndrome (ARDS) assessed using using patient electronic medical records during the in-patient stay
12. Presence of acute kidney injury (AKI) assessed using using patient electronic medical records during the in-patient stay
13. Organ failure assessed using sequential organ failure assessment (SOFA) score during the in-patient stay
14. Mortality assessed using patient electronic medical records during the in-patient stay
15. VTE assessed using patient electronic medical records and the hospital acquired thrombosis alert system, already in place for recording this data, up to 90 days post-hospital discharge

Completion date
30/11/2020

Eligibility

Key inclusion criteria
1. Adult (aged 18 years or older)
2. Admitted to Oxford University Hospitals NHS Foundation Trust with confirmed or high clinical suspicion of COVID-19

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
All

Total final enrolment
303

Key exclusion criteria
Does not meet inclusion criteria

Date of first enrolment
01/03/2020

Date of final enrolment
31/08/2020

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Oxford University Hospitals NHS Foundation Trust
Headley Way
Oxford
United Kingdom
OX3 9DU

Sponsor information

Organisation
Oxford University Hospitals NHS Trust

ROR
https://ror.org/03h2bh287

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated and/or analysed during the current study during this study will be included in the subsequent results publication.

IPD sharing plan summary
Other

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		22/12/2020	13/07/2021	Yes	No
HRA research summary			28/06/2023	No	No