Outcomes of surgery in COVID-19 infection: international cohort study (CovidSurg)

There is an urgent need to understand the outcomes of COVID-19 infected patients who undergo surgery. Capturing real-world data and sharing international experience will inform the management of this complex group of patients who undergo surgery throughout the COVID-19 pandemic, improving their clinical care.

In order to contribute to CovidSurg you must first secure research/audit approval, according to local regulations. This short protocol has been written to support that process. The global community has recognised that rapid diassemination and completion of studies in COVID-19 infected patients is a high priority, so we encourage all stakeholders (local investigators, ethics committees, IRBs) to work as quickly as possible to approve this project. **This investigator-led, non-commercial, non-interventional study is extremely low risk, or even zero risk.** This study does not collect any patient identifiable information (including no dates) and data will not be analysed at hospital-level.

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Primary objective

To determine 30-day mortality in patients with COVID-19 infection who undergo surgery. This will inform future risk stratification, decision making, and patient consent.

Inclusion criteria

The inclusion criteria are:

- Adults (age ≥18 years) undergoing ANY type of surgery in an operating theatre, this includes obstetrics.

AND

- Either before or after surgery: (i) lab test confirmed COVID-19 infection or (ii) clinical diagnosis of COVID-19 infection (no test performed).

Therefore this study should capture:

- emergency surgery patients with clinical diagnosis or lab confirmation of COVID-19 infection **before** surgery.
- emergency surgery patients with clinical diagnosis or lab confirmation of COVID-19 infection **after** surgery.
- elective surgery patients with clinical diagnosis or lab confirmation of COVID-19 infection **after** surgery.

Patients who meet the inclusion criteria should be included regardless of surgical indication (benign surgery, cancer surgery, trauma surgery, obstetric), anaesthetic type (local, regional, general), procedure type, or surgical approach (minimally invasive, open surgery).

At most sites it is anticipated that the number of eligible patients is likely to be low. **If possible** all consecutive patients fulfilling inclusion criteria should be entered.

Study period

Overall we plan to close data entry in September 2020 when the global pandemic is likely to be over, however individual centres may select their own study windows, depending on the timing of COVID-19 epidemic in their community.

Patient enrolment

Ideally patients should be identified prospectively:

- At the time of surgery (patients who had test proven or clinically diagnosed COVID-19 infection before surgery)
- At the time of COVID-19 diagnosis (patients in whom COVID-19 is first suspected after surgery).

However, given the rapid progression of the global pandemic, there may be no further new cases of COVID-19 infection in some hospitals that treated large numbers of COVID-19 earlier in the pandemic. It is important to capture the experience of these centres, therefore **retrospective patient identification and data entry is permitted**.

Primary outcome

- 30-day mortality

Secondary outcome

- 7-day mortality
- 30-day reoperation
- Postoperative ICU admission
- Postoperative respiratory failure
- Postoperative acute respiratory distress syndrome (ARDS)
- Postoperative sepsis

Data collection

Data will be collected and stored online through a secure server running the Research Electronic Data Capture (REDCap) web application. REDCap allows collaborators to enter and store data in a secure system. A designated collaborator at each participating site will be provided with REDCap project server login details, allowing them to securely submit data on to the REDCap system. REDCap has previously been successfully used for a range of other international cohort studies led by the central unit, including the GlobalSurg and ESCP Cohort studies. The REDCap server is managed by the University of Birmingham, UK.

Only anonymised data will be uploaded to the database. **No patient identifiable data will be collected.** Data collected will be on comorbidities, physiological state, treatment/operation, and outcome. No dates (e.g. date of surgery) will be collected.

qSOFA and CURB-65 will be calculated based on the individual data points entered.

Local approvals

The principal investigator at each participating site is responsible for obtaining necessary local approvals (e.g. research ethics committee or institutional review board approvals). Collaborators will be required to confirm that a local approval is in place at the time of uploading each patient record to the study database.

Where an audit approval is needed, this can be either registered as service evaluation, or to benchmark against an auditable standard (e.g. overall mortality after emergency surgery should be <15%).

Prior to formal local study approval, collaborators may prospectively collect data on hard copy case report forms, but this should not be uploaded to the REDCap database until approval is confirmed.

Analysis

A detailed statistical analysis plan will be written. Analyses will be overseen by the independent data monitoring committee (DMC). Reports will include description of the primary and secondary outcomes in the cohort. Multivariable modelling will be undertaken to

identify risk factors for 30-days mortality. Analyses will be stratified according to whether or not diagnosis of COVID-19 was confirmed by a lab test.

Interim analyses will be performed as guided by the independent DMC. The first analysis will be performed once 50 patients have been entered on to the database, and the frequency of subsequent analyses will be agreed with the DMC. The decision to submit data for publication will be agreed by the steering committee with the DMC. Hospital-level data will not be released or published.

Authorship

Collaborators from each site who contribute patients will be recognised on any resulting publications as PubMed-citable co-authors. A corporate authorship model will be used (example: https://pubmed.ncbi.nlm.nih.gov/29452941).