Study to identify markers that could predict COVID-19 outcome

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COVID-19 is the UK's largest public health crisis since World War II. There is an urgent need to identify why some patients with the virus do very well whereas others need to be admitted to intensive care and may die from the disease. A new observational study aimed at identifying markers that predict how COVID-19 affects patients is being led by

clinicians and academics at North Bristol NHS Trust and the University of Bristol.

The DISCOVER (DIagnostic and Severity markers of COVID-19 to Enable Rapid triage) study is focused on blood-based biomarkers and their ability to predict a patient's disease course alongside demographic factors such as age, sex, frailty and other medical conditions.

When patients with suspected or confirmed COVID-19 are admitted to hospital, they will be approached by the research team and consented for blood sampling and access to their medical history. These patients will then be followed up for 28 days, remotely, and their clinical progress recorded. Blood samples from the study will be stored anonymously for future research.

One biomarker the research team will test is suPAR (soluble urokinase plasminogen activating receptor), which has already had encouraging results from Greek data, alongside other more conventional tests, such as troponin, NT-proBNP and ferritin. The team will also test a variety of molecules that control the immune system, known as "cytokines". This is very important as, although the majority of patients with COVID-19 recover quickly, at the present time doctors do not yet know the best way to predict which patients to keep in hospital to monitor more closely. This early triage of patients is crucial to manage the pressure on hospital beds safely.

Dr. David Arnold at North Bristol NHS Trust and NIHR Doctoral Research Fellow in the Bristol Medical School: (THS), said: "We hope to rapidly publish this work and share our results with other UK and international centres to allow wider use of successful prognostic biomarkers. Our study could help doctors in the future decide which tests are useful in managing coronavirus and which are not."

Dr. Fergus Hamilton, Honorary Research Fellow in the Bristol Medical School: (PHS), added: "One of the key strengths of DISCOVER is that despite the rapid speed of application, ethical approval, and data collection, plans were made early to collaborate with both local and national researchers to ensure that any samples or data collected will be available to ensure the benefit to the wider research community, and ultimately, to patients. We have developed many collaborations over a short period, including with the UNCOVER group and Public Health England."

Collaborations include:

- Development and testing of antibody testing (or 'immunity passports')
- Developing techniques to measure drug levels for potential treatments for COVID-19
- Finding ways to measure live virus in blood (with one of only two labs in the UK authorized to work with SARS-CoV-2)
- Understanding the 'microbiome' of COVID-19 patients in the intensive care unit
- Measurement of whether patients with cancer have a different immune response to COVID-19
- Testing whether patients' genes (or how they are activated) affects response to COVID-19

Patients admitted to University Hospitals Bristol and Weston NHS Foundation Trust (UHBW) will shortly join the North Bristol NHS Trust led study, with hospitals in Exeter and Gloucester entering in the coming weeks.

Provided by University of Bristol