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Studying the immune response and long-term morbidity of COVID-19 infection in pregnancy

Submission date
12/05/2020

Recruitment status
No longer recruiting

Registration date
11/06/2020

Overall study status
Completed

Last Edited
14/11/2022

Condition category
Infections and Infestations

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

Plain English summary of protocol

Background and study aims
COVID-19 is a condition caused by the coronavirus (called SARS-CoV-2) that was first identified in late 2019. This virus can infect the respiratory (breathing) system. Some people do not have symptoms but can carry the virus and pass it on to others. People who have developed the condition may develop a fever and/or a continuous cough among other symptoms. This can develop into pneumonia. Pneumonia is a chest infection where the small air pockets of the lungs, called alveoli, fill with liquid and make it more difficult to breathe.
In 2020, the virus has spread to many countries around the world and neither a vaccine against the virus or specific treatment for COVID-19 has yet been developed. As of April 2020, it is advised that people minimize travel and social contact, and regularly wash their hands to reduce the spread of the virus.
Groups who are at a higher risk from infection with the virus, and therefore of developing COVID-19, include people aged over 70 years, people who have long-term health conditions (such as asthma or diabetes), people who have a weakened immune system and people who are pregnant. People in these groups, and people who might come into contact with them, can reduce this risk by following the up-to-date advice to reduce the spread of the virus.
Several expert groups, including the Royal College of Obstetricians and Gynaecologists have suggested pregnant women, who are usually young and healthy, are at increased risk of becoming unwell if they catch the virus. There is very limited information for healthcare professionals on how to best treat women who become unwell. Pregnant women and their families are understandably worried because little is known about how infection progresses.
Researchers have proposed to carry out a research study to answer the following about pregnant women diagnosed with COVID-19:
1. What are the factors that might make pregnant women more prone to severe infection? The researchers are especially interested in the impact of ethnicity.
2. What happens to the system that the body uses to fight infections (known as the immune system) of pregnant women who are admitted to hospital?
3. Is there any immune response against the virus in the placenta?
4. What are the short and medium to long-term implications to women who develop COVID-19 infection in pregnancy and their babies?
It is hoped that answering these questions will improve the care given to pregnant women in East London and across the UK.

Who can participate?
Pregnant women who are admitted to a Barts Health NHS Trust hospital and have suspected (symptomatic) or confirmed COVID-19 infection and up to 2 weeks post-delivery. They must be 18 years or older. Pregnant women may also be identified via the COVIDENCE-UK study, a national study of individuals enrolled from the community who are potentially diagnosed with COVID-19.

What does the study involve?
A sample of blood will be taken to examine the immune cells in the participant's blood and a sample of their urine to check the health of their kidneys. This will mean taking a little extra blood (5 ml, about a teaspoon) when the routine blood test is taken. Comparing these immune cells between different women can help us understand why some women get sicker than others. The researchers will also run some standard laboratory tests on the participant's blood to measure the level of infection. They will collect routine data from the participant's hospital or GP records, such as standard information about their pregnancy, the outcome of their birth, their health and the health of their baby. After the participant has given birth, the researchers would like to collect the placenta (afterbirth) of a sub-set of women and a little blood from the cord, to examine whether the virus is present or whether there is an immune response in the placenta, and whether protective antibodies are passed on to their baby. If the participant does not wish the researchers to collect this, the participant can still take part in the rest of the study. The researchers will invite participants for up to three hospital visits, 3, 6 and 12 months after they have had their baby. This is to test their lung function (this involves blowing hard into a machine to measure the capacity of their lungs), and to ask them questions about their health. The researchers will also take another blood sample (10 ml, about 2 teaspoons) at these visits to examine their immune response again, as well as a small amount of urine. If the participant is unable to come to the hospital, the researchers will call them instead, but they will get a better picture of how healthy the participant's lungs are if they come into the hospital for this visit.

What are the possible benefits and risks of participating?
Although participants may not receive any direct benefits from participating in the study, they will be able to contribute to the advancement of understanding of the effects of COVID 19 on medium- to long-term maternal lung function and immunological response in pregnant women and their babies. As there is no intervention for this study it is anticipated that the risk to participants' physical wellbeing associated with participation in this study are low.

Where is the study run from?
The study is coordinated from the Centre for Women's Health, Queen Mary University of London. The study is recruiting at Barts Health NHS Trust.

When is the study starting and how long is it expected to run for?
May 2020 to November 2022

Who is funding the study?
The study has received initial funding from the February Foundation and is currently subject to further funding applications to enable full participant follow-up.

Who is the main contact?
Dr Stamatina Iliodromiti (clinical)
Dr Doris Lanz (operational)
Unfortunately, this study is not recruiting public volunteers at this time. This is because the research isn't ready for volunteers yet or the researchers are directly identifying volunteers in

certain areas or hospitals. Please do not contact the research team as they will not be able to respond. For more information about COVID-19 research, visit the Be Part of Research homepage.

Contact information

Type(s)
Public

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Integrated Research Application System (IRAS)
283699

Study information

Scientific Title

COVID-19 infection in pregnancy (COVIpreg-UK): a prospective cohort study of immunological response and long-term maternal morbidity

Acronym
COVIpreg-UK

Study objectives
COVID-19 is a novel disease which has triggered unanswered questions, many related to its progression and sequelae of events in pregnancy. The researchers propose a prospective cohort study of pregnant women admitted to Barts Health NHS Trust with confirmed or suspected COVID-19 to allow systematic categorisation of women according to clinical and immune phenotypes.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 19/05/2020, North West – Haydock Research Ethics Committee (3rd Floor – Barlow House, 4 Minshull Street, Manchester, M1 3DZ, UK; +44 (0)2071048012; haydock.rec@hra.nhs.uk), REC ref: 20/NW/0257

Primary study design
Observational

Study design
Prospective cohort study

Study type(s)
Other

Health condition(s) or problem(s) studied
COVID-19 (SARS-CoV-2 infection) in pregnant women

Interventions
This study is designed as a prospective cohort study of pregnant women admitted to hospital with suspected or confirmed COVID-19 infection who consent to participation in the study. Recruitment will be over 6 months with follow-up data being collected at 3, 6 and 12 months post-discharge, or post-delivery (if COVID-19 infection does not coincide with delivery time). There will be an additional blood sample for immunological response assessments. Follow up data include lung function tests (spirometry) and exercise capacity assessments (6-minute walk). Quality of life questionnaire (EQ-5D-3L). Tissue from the placenta and cord blood will be taken on a subset of women.

Intervention Type
Other

Primary outcome(s)
Lung function for mothers measured by spirometry at 3 months post-discharge (if COVID-19 infection coincides with delivery) or 3 months post-delivery (if COVID-19 infection does not result in or coincide with delivery)

Key secondary outcome(s)

Maternal outcome measures:
1. Lung function: Forced Expiratory Volume in one second (FEV1 measured in Litres); Forced Vital Capacity (FVC measured in Litres); Forced Expiratory Flow between 25% and 75% of vital capacity (FEF25-75 measured in Litres/sec) measured using NDD Easy on-PC spirometer and weight (for adjustment of lung function test) for mothers at 3, 6 and 12 months post-discharge, or post-delivery (in the event that admission for COVID-19 infection does not coincide with delivery)
2. A 6-minute walking test measuring how far in metres the participant can walk in 6 minutes, collected at 3, 6 and 12 months post-discharge or post-delivery
3. Breathlessness measured using a short MRC dyspnoea scale questionnaire, scored from 1 (best) to 5 (worst), collected at 3, 6 and 12 month follow up visits
4. Clinical information related to COVID-19 infection (symptoms, treatment and date of diagnosis) at baseline and delivery
5. Laboratory assessments (Protein to Creatinine Ratio in urine, Full blood count [FBC], Urea and Electrolytes [U&Es], LDH, Liver function tests [LFTs], D-Dimer, C-Reactive Protein [CRP]) at baseline, 3, 6 and 12 months post-discharge or post-delivery
6. Radiological findings on chest X-ray or CT chest (when clinically indicated) at baseline
7. Immunological profile measured using flow cytometry and qPCR at baseline, 3, 6 and 12 months post-discharge or post-delivery
8. Thromboembolic events collected from medical records during admission or within 6 weeks of delivery
9. Quality of life measured using EQ-5D-3L Questionnaire at 3, 6 and 12 months post-discharge or post-delivery

At discharge (collected from medical records):
10. Length of hospital stay
11. Reason for admission
12. Admission to intensive care/high dependency unit
13. Time to admission to intensive care/high dependency unit from admission
14. Type of respiratory support

At discharge, 3, 6 and 12 months post-discharge, or post-delivery (collected from medical records):
15. All-cause mortality
16. Time to death

Obstetric outcome measures:
At delivery (collected from medical records):
17. Mode of delivery
18. Gestation of delivery
19. Blood loss at delivery/transfusion at delivery
20. Mode of anaesthesia
21. Operative interventions (any reason)
22. Placental histology and microscopy (on a subset of women)

Infant outcome measures:
At delivery (collected from medical records):
23. Birth weight
24. Apgar at 1 and 5 mins
25. Admission to neonatal unit

26. Neonatal infection state
27. Signs/symptoms of sepsis
28. Immunological profile at delivery (cord bloods; IgG and IgM)

At 3, 6 and 12 months post-discharge or post-delivery (collected from medical records and case report forms):
29. Breastfeeding rates

Completion date
11/11/2022

Eligibility

Key inclusion criteria
1. Pregnant women who are admitted to the hospital and have suspected (symptomatic) or confirmed COVID-19 infection and up to 2 weeks post-delivery
2. Age ≥18 years

Note that women admitted for any reason, including non-COVID-19 related reasons such as obstetric reasons, will be included.

Pregnant women may also be identified via the COVIDENCE-UK study (NCT04330599), a national observational cohort study of individuals enrolled from the community that can be potentially diagnosed with COVID-19.

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
Female

Key exclusion criteria
1. Patients unwilling to give consent
2. Unable to understand sufficient English, and no translator or translation services are available

Date of first enrolment
20/05/2020

Date of final enrolment
13/11/2020

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Barts Health NHS Trust
The Royal London Hospital
Whitechapel Rd
Whitechapel
London
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E1 1BB

Sponsor information

Organisation
Queen Mary University of London

ROR
https://ror.org/026zzn846

Funder(s)

Funder type
Charity

Funder Name
February Foundation (UK Charity Reg. 1113064, Funds to pump-prime COVID-19 research)

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
Study website	Study website	11/11/2025	11/11/2025	No	Yes