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Investigating point of care diagnostic strategies to optimize the rapid diagnosis of COVID-19 in routine public and private health care settings in South Africa

Submission date
26/08/2021

Recruitment status
No longer recruiting

Registration date
28/10/2021

Overall study status
Completed

Last Edited
28/10/2021

Condition category
Infections and Infestations

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

Plain English summary of protocol

Background and study aims
Like many countries in the world, South Africa is experiencing a COVID-19 pandemic, caused by the SARS-CoV-2 virus. This virus comes from a family of viruses called coronaviruses.
At the moment, the best way to detect SARS-CoV-2 is to conduct a test called real-time Reverse transcription polymerase chain reaction (RT-PCR). Whilst this test is accurate, the test can only be done in a laboratory by highly skilled laboratory staff, and the results take a long time to reach the person who wants to know if they are infected, or not. This test is also expensive.
This study focuses on investigating new rapid tests to detect infection with SARS-CoV-2. These new tests can be conducted in the community/clinics/hospitals by other health workers, besides laboratory staff. These new tests are quick and cheap, and results are available after approximately 5-30 minutes depending on the type of test used. We are doing this study to check whether these results are accurate. If we find that these rapid tests are accurate then we may be able to use these rapid tests in the community to do mass COVID-19 testing. Mass testing is important to help us quickly identify who is infected, so they may be cared for, and isolated to prevent the spread of the virus to others. We are planning to test approximately 5000 people for this study from at least three health facilities.

Who can participate?
• Age 18 years and older
• Has symptoms of COVID-19 and meets current NICD/NHLS case definition for testing, or
• Has been in close contact with a SARS-CoV-2 RT-PCR positive person (>15 minutes in a poorly ventilated space or less than 1 metre apart)

What does the study involve?
We will collect information from you, such as your age and whether you are a male or female. We will also ask you how you are feeling today, any other illnesses you have and what treatment you are on. Some questions may be sensitive e.g. questions about whether you have HIV, TB, diabetes (sugar) and hypertension so that we can understand the relationship between these

diseases and COVID-19. You may choose not to answer these questions.
As part of the study we will be doing the following tests:
1. Finger prick COVID-19 rapid test: We will prick you and do a rapid test(s) using one or more kits for COVID-19. The rapid test result(s) can be given to you, but it will not be your final confirmed COVID-19 result because the result(s) may be wrong. Your true COVID-19 test result will come from RT-PCR testing in the laboratory. If you test RT-PCR or rapid test COVID-19 positive, we will follow you up in 5 to less than 14 days and possibly at 25-30 days, 3, 6, 9 and 12 months.
2. Blood tests: We will collect approximately six teaspoons of blood at the first visit and up to six teaspoons of blood at each follow-up visit, in special tubes.
• At follow-up, in the Western Cape site, we will take four more teaspoons of blood to do additional tests on immune function on 100 people because the laboratory that specializes in these tests is located in the Western Cape.
• We will also take 4 more teaspoons of blood from a group of participants (or from all participants if budget allows), for more detailed tests to understand how the body responds to COVID-19. These additional 4 teaspoons will be used for more detailed tests to understand how the body responds to COVID-19.
• In summary, we could take between six and fourteen teaspoons of blood from you at each visit if you are in the Western Cape, and between six and ten teaspoons of blood from you at each visit, if you are in Limpopo and Gauteng province.
• It is safe to take this amount of blood. We will send specimens to the laboratory for COVID-19 testing including how the soldiers of the body (the immune system) respond to COVID-19 infection. We will collect swabs for COVID-19 RT-PCR testing in the laboratory.
3. Naso or naso-pharyngeal swab: We may also collect one additional naso- or nasopharyngeal swab for genome analysis – this means to see what genes the virus has.
4. Saliva sample: We will take a saliva sample to test whether COVID-19 can be diagnosed using saliva.
5. Nasal swab: If your site is testing rapid tests that detect the SARS-CoV-2 virus then we will ask for a nasal swab to see if we can find virus particles in your nasal swab.
Any residual samples will be stored in a biorepository, so that we can do additional diagnostic testing as new tests become available, or so that we can test for antibodies and study other immune factors such as cytokines and white blood cells which assist in fighting the infection. Your samples will be stored under strictly controlled conditions and all of the data linking the data with your identity will be protected. It may become necessary to transfer some of the material to laboratories around the country but this will be under strict control. You will be able to withdraw your material from storage if you are concerned about this aspect.
We will also ask to interview and take blood from people in your house who are well. Only 500 people who test COVID-19 RT-PCR and rapid test negative will be followed up. This follow-up visit will involve repeating the swabs. We will also repeat the rapid test(s) and will take more blood, as explained above. The blood will be used to find antibodies to COVID-19 disease. They may tell us whether you have no COVID-19 infection, recent infection or past infection. We will time key activities related to this study (i.e. sample collection and result notification).

What are the possible benefits and risks of participating?
You might feel discomfort when the swab is taken and some pain when blood is taken. Taking blood rarely causes infection. The specimens will be taken by trained staff who will wear appropriate protective equipment.
There are several benefits for you and the country: You will learn if you are infected with COVID-19 or not. You will contribute to our knowledge about better testing methods for COVID-19.

Where is the study run from?
South African Medical Research Council

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

Who is funding the study?
The South African Medical Research Council and National Health Laboratory Services (South Africa)

Who is the main contact?
Prof Ameena Goga, Ameena.Goga@mrc.ac.za
Adri Labuschagne, adri.labuschagne@mrc.ac.za

Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

Study information

Scientific Title
Investigating point of care diagnostic strategies to optimize the rapid diagnosis of COVID-19 in routine public and private health care settings in South Africa

Acronym
SA COVID-19 POC STUDY

Study objectives
1. Point of care rapid tests for COVID-19 are not inferior to RT-PCR testing for COVID-19 i.e. A rapid Ab test performed on a suspected COVID-19 person in routine conditions at two time points that are 5 to<14 days apart provides a sensitive and specific diagnostic approach compared to a single RT-PCR at initial presentation.
2. If Aim 1 is true, then a rapid point of care COVID-19 testing protocol will include two serial rapid tests one week apart
3. Clinical symptoms and clinical outcome have a high correlation with positive rapid point of

care COVID-19 test results.
4. At least 50% of asymptomatic contacts of confirmed COVID-19 cases will have positive RT-PCR test results, and at least 45% will have a positive antibody result.

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Approved 31/08/2020, South African Medical Research Council Human Research Ethics Committee (Francie Van Zijl Drive, Parowvallei, 7505, Cape Town, Po Box 19070, Tygerberg, 7505, South Africa; +27 (0)21 938 0687; adri.labuschagne@mrc.ac.za), ref: EC005-4/2020
2. Approved 02/04/2020, Wits HREC Research Office (Faculty of Health Sciences, Phillip Tobias Building, Offices 301-304, 3rd Floor, Cnr York Road and 29 Princess of Wales Terrace, Parktown, 2193, South Africa; no telephone number provided; no email provided), ref: M200402
3. Approved 24/04/2020, TURFLOOP RESEARCH ETHICS COMMITTEE ETHICS (Department of Research Administration and Development Private Bag X1106, Sovenga, 0727, South Africa; +27 (015) 268 3935; anastasia.ngobe@ul.ac.za), ref: TREC/67/2020: IR
4. Approved 30/07/2020, University of Cape Town Faculty of Health Science Human Research Ethics Committee (The Human Research Ethics Committee G50 Old Main Building Groote Schuur Hospital Observatory, 7925, Cape Town, South Africa; no telephone number provided; hrec-enquiries@uct.ac.za), ref: HREC REF: 387/2020

Primary study design
Observational

Study design
Prospective observational cohort study

Study type(s)
Screening

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

Interventions
1. Finger prick COVID-19 rapid test: We will prick participants and do a rapid test(s) using one or more kits for COVID-19. The rapid test result(s) can be given to participants, but it will not be participantsr final confirmed COVID-19 result because the result(s) may be wrong. participantsr true COVID-19 test result will come from RT-PCR testing in the laboratory. If participants test RT-PCR or rapid test COVID-19 positive, we will follow participants up in 5 to less than 14 days and possibly at 25-30 days, 3, 6, 9 and 12 months.
2. Blood tests: We will collect approximately six teaspoons of blood at the first visit and up to six teaspoons of blood at each follow-up visit, in special tubes.
• At follow-up, in the Western Cape site, we will take four more teaspoons of blood to do additional tests on immune function on 100 people because the laboratory that specializes in these tests is located in the Western Cape.
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• In summary, we could take between six and fourteen teaspoons of blood from participants at

each visit if participants are in the Western Cape, and between six and ten teaspoons of blood from participants at each visit, if participants are in Limpopo and Gauteng province.
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5. Nasal swab: If participantsr site is testing rapid tests that detect the SARS-CoV-2 virus then we will ask for a nasal swab to see if we can find virus particles in participantsr nasal swab.
Any residual samples will be stored in a biorepository, so that we can do additional diagnostic testing as new tests become available, or so that we can test for antibodies and study other immune factors such as cytokines and white blood cells which assist in fighting the infection. participantsr samples will be stored under strictly controlled conditions and all of the data linking the data with participantsr identity will be protected. It may become necessary to transfer some of the material to laboratories around the country but this will be under strict control. participants will be able to withdraw participantsr material from storage if participants are concerned about this aspect.
We will also ask to interview and take blood from people in participantsr house who are well. Only 500 people who test COVID-19 RT-PCR and rapid test negative will be followed up. This follow-up visit will involve repeating the swabs. We will also repeat the rapid test(s) and will take more blood, as explained above. The blood will be used to find antibodies to COVID-19 disease. They may tell us whether participants have no COVID-19 infection, recent infection or past infection. We will time key activities related to this study (i.e. sample collection and result notification).

Intervention Type
Other

Primary outcome(s)
Performance evaluation of Point Of Care tests is conducted by comparing field based SARS-CoV-2 rapid test results to gold standard laboratory based PCR results from accredited laboratories. Rapid tests and PCR are conducted at the baseline visit and 5 - 14 day follow up visit for persons under investigation

Key secondary outcome(s)
1. Cost effectiveness and ease of use data is collected via CRF administration at Baseline and 5-14 day follow up
2. Clinical symptoms data is collected via CRF at baseline and 5-14 day follow up and will be correlated to rapid and PCR test results
3. SARS-CoV-2 antibody efficiency/correlation is measured by conducting laboratory-based serology and neutralisation assays from blood samples collected at baseline and follow up
4. To compare rapid test results obtained against lab based formal serology platforms at baseline and 5-14 day follow up
5. Characterization of the viral genome of SARS-CoV-2 in infected participants will be conducted by performing lab-based sequencing assays from swab samples collected at baseline and follow up visits

Completion date
30/09/2022

Eligibility

Key inclusion criteria
1. Age 18 years and older
2. Has symptoms of COVID-19 and meets current NICD/NHLS case definition for testing
3. Has been in close contact with a SARS-CoV-2 RT-PCR positive person (>15 minutes in a poorly ventilated space or ≤1 metre apart) and
4. Age 18 years and older and
5. Agrees to providing paired naso-pharyngeal and blood samples and
6. Self-reports not feeling sick or no symptoms of COVID-19 on initial questioning

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Key exclusion criteria
Participant does not consent to follow-up including home based follow-up

Date of first enrolment
01/10/2020

Date of final enrolment
30/09/2021

Locations

Countries of recruitment
South Africa

Study participating centre
Chris Hani Baragwanath hospital
11th floor
New Nurses Home
Johannesburg
South Africa
1864

Study participating centre
Groote Schuur Hospital
Main Rd
Observatory
Cape Town
South Africa
7935

Study participating centre
Pietersburg Provincial Hospital
Corner Dorp and Hospital street
Pietersburg
South Africa
0700

Sponsor information

Organisation
South African Medical Research Council

ROR
https://ror.org/05q60vz69

Funder(s)

Funder type
Research council

Funder Name
South African Medical Research Council

Alternative Name(s)
The South African Medical Research Council, The SAMRC, SAMRC

Funding Body Type
Government organisation

Funding Body Subtype
Other non-profit organizations

Location
South Africa

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request. Ameena Goga PI, Ameena.Goga@mrc.ac.za, interim data is currently available, final datasets will be available at the end of the study. Current access to data has been granted to collaborators listed in the protocol. Consent was obtained from the participants via the IC. All data is anonymized. We have Ethics approval to utilise data for purposes listed in the protocol, Ethics approval will be obtained for any future unlisted analysis.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	for asymptomatic participants version 5	31/03/2021	02/09/2021	No	Yes
Participant information sheet	for symptomatic participants version 5	31/03/2021	02/09/2021	No	Yes
Protocol file	version 5	31/03/2021	02/09/2021	No	No