

Using the Antibody Test for COVID-10

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In order to diagnose an infection due to Coronavirus type SARS-CoV-2 - called COVID-19 involves 3 parts.

1. Clinical signs of COVID-19
2. Detection of the virus SARS-CoV-2 in airway secretion swabs
3. Detection of antibodies for SARS-CoV-2 in the blood.

To confirm immunity is even more complex. However, the presence of IgG in the blood against a particular organism, be that a virus or bacteria, is highly indicative of protection. It forms the basis immunity testing worldwide.

Detecting the Virus

The virus is normally present for several days or even longer prior to symptoms developing. Although the virus is found in the airways only a small percentage can be detected in the nasopharyngeal space. A nasal swab might reveal a negative test result even though a patient has COVID-19. Several validation studies have demonstrated a low sensitivity even in patients who have the disease. Swab tests are based upon identifying virus genes using Polymerase Chain Reaction (PCR) which are both accurate and able to identify as few as 10 virus particles in a test. However, it is clear that harvesting the virus on simple swabs is unreliable and often deep lung samples are needed – this is a specialist test performed only in hospitals and in very sick patients. All these tests are carried out in a laboratory and are both costly and time consuming.

Detecting Antibodies to a Virus During Infection.

For diagnostic purposes it is important that any test used to identify a specific virus is able to do so within a few days of symptom debut. In the acute phase an antibody test can supplement a nasopharyngeal swab test. There are different types of antibodies, IgM antibodies are formed early on in the course of the disease and their binding to the virus is quite weak which may render it difficult to identify them. Furthermore, IgM may bind to other microorganisms and their presence may relate to an entirely different infection. IgG is an antibody which prevents infection of other bodily cells.

A positive IgM results should be followed up by testing for IgG in order to confirm the diagnosis. If IgG remains negative there is likely a false IgM positive result. A positive IgM finding is an indicator that the individual has been infected but it not immune for Corona virus.

Detecting Antibodies in the Assessment of Immunity

The detection of antibodies is important for establishing whether the patient has gained a degree of immunity for SARS-CoV-2. No antibody tests are completely able to determine whether an individual is immune from reinfection. However, if the patient has high levels of IgG then immunity is very likely. Whilst it has yet to be established precisely how long and how secure this immunity is in SARS-CoV-2 infections, it is the basis of most tests for immunity and it is likely to endure for many months. At this stage it is prudent to re-test for IgG after a few months.

Accuracy Is essential

In both the diagnosis of infection and the assessment of immunity it is crucial to use a test that has a high degree of precision i.e., both sensitivity and specificity. Some tests, currently on the market have woeful accuracy or have been tested in poorly regulated facilities. It is also essential to separate IgM from IgG and to detect both, accurately. Some tests are not able to separate IgM from IgG separately, but provide a combined result, which is of course can mislead individuals and their medical teams.

Rigour in Testing

Most importantly, other tests have not been assessed to determine whether the detected antibodies are able to neutralise the virus by preventing it from infecting other cells (protective antibodies). These tests are expensive, complex and take a long time to complete. The Biosynex COVID-19 IgG/IgM antibody test passed this testing in an independent facility. It is produced in France by the publicly listed company Biosynex SA. The Biosynex COVID-19 IgG/IgM antibody test detects IgM and IgG separately with a high degree of sensitivity and specificity. The test has been evaluated by amongst others, the Pasteur Institute in France – a world leading institute in the microbiology sphere. Moreover, the test has been recommended by the French National Authority (Haute Autorité de Santé).

The results

- **Confirming an active Infection**

If a test demonstrates a negative results due to the fact that it has been taken early on in the course of the disease a second test is recommended and if positive then seroconversion has occurred and this is generally considered to be a strong indicator of infection. **Confirming**

- **Immunity**

If the test if positive for IgG patients are likely to have immunity for several months.

Speed and Ease of Analysis

This so-called quick test can be carried out while the patient is still present as its results are available in just 10 minutes! Furthermore, it simply requires a drop of blood from a small finger prick.

Caution

It must be emphasised that the recommendations of the Health Authorities regarding the management of COVID-19 must be strictly followed and that antibody tests must be interpreted in conjunction with clinical symptoms. In principle, everyone with COVID-19 symptoms should be considered to be capable of spreading the infection. Swab or blood tests should not be used alone to determine whether a patient is infectious or not.

Furthermore, immunity inferred by the presence of IgG should not be taken as an indication that government policies on social distancing and protective measures may be ignored. The results of this test does not alter the need for citizens to comply with these requirements at all times.

Interpreting Test results for IgM and IgG antibodies

