「Non-invasive skin swab could quickly detect covid-19: Lancet study」

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A recent study published in the journal Lancet E Clinical Medicine has described a new non-invasive method to quickly detect COVID-19. Instead of using mucus or blood samples to test for the virus, their method uses skin swabs to test sebum secretions. The study was conducted by investigators from the Universities of Surrey, Manchester and Leicester, in collaboration with the Frimley NHS Trust.

A key aspect of the COVID-19 pandemic has been the amount of testing conducted around the world. Mass testing is necessary to contain the virus and reduce the burden on the health services. Therefore, there has been unprecedented demand for testing over the last one year. The clinical manifestations of COVID-19 reflect both the direct harm caused by the virus infection and the immune response of the host. The most widely used approach for testing requires a polymerase chain reaction or PCR test, which involves taking a swab of the back of the throat and far inside the nose or nasal swabs. However, this approach has a sizable false-negative rate and fails to offer prognostic value. Thus, test the impact of the virus on the host rather than the virus itself will serve as an additional testing modality.

For the study, researchers collected samples of sebum -- a waxy, oily substance produced by the body's sebaceous glands that are located on the face, neck or back -- from 67 hospitalized patients, 30 who had tested positive for covid-19 and 37 who tested negative. These samples were collected by gently swabbing the skin area and then been analyzed the samples by using liquid chromatography-mass spectrometry, a technique that looks for residual chemical compounds, and a statistical modelling technique to differentiate between the covid-19 positive and negative samples. The researchers found that patients with a positive covid-19 test had lower lipid levels -- known as dyslipidemia -- than their counterparts who had tested negative. They also noted that the accuracy of the findings increased further when medication and additional health conditions were controlled.

This study suggests that it is able to use non-invasive means to test for diseases such as covid-19 in the future -- a method which will be welcomed by all. COVID-19 damages many areas of metabolism. This work demonstrated that the skin lipidome which could have implications for the skin’s barrier function can be added to the list, as well as being a detectable symptom of the disease itself. The sebum sampling could not only help with detecting the COVID19 virus but also its effect on the host’s metabolism.

However, there are a few more points to note. The non-COVID-19 patients in this study were sampled in May, June, or July, and therefore had a lower incidence of other respiratory illnesses caused by seasonal respiratory viruses. This may have led to a potential absence of confounding factors since the latter could

also cause lipid metabolism to register a change that could potentially prevent the identification of characteristic COVID-19 features. Moreover, samples of sebum from COVID-19 patients taken over time will help to identify the time frame along which the sebum lipids become normal again following COVID-19 and the predictive power of these changes, which will determine its application in clinical or mass testing.

In conclusion, the study confirmed that COVID-19 infection leads to dyslipidemia in the stratum corneum. Sebum lipidomics can help identify COVID-positive and negative patients with greater certainty if they are grouped by comorbidity. The ease with which sebum samples are obtainable, transported, and stored makes this a promising approach for sebum sampling for the diagnosis and prognosis of COVID-19.

Reference:

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