Research Investment Leads to Better COPD Diagnosis Method

Researchers from the Victoria Institute of Clinical Research & Evaluation working in partnership with Dr. Francis Lin's Immunotrafficking Lab at the University of Manitoba and Seven Oaks General Hospital have developed a safe and more efficient method to diagnose Chronic Obstructive Pulmonary Disease (COPD).

"This new method uses a microchip smaller than those found on a credit card with specially designed channels to test the interaction between white blood cells and mucus from the lower airways (sputum). COPD sputum contains factors that can attract white blood cells, and the level of motion can be used as a measure of COPD," says Dr. Susy Santos, Director of the Victoria Institute of Clinical Research & Evaluation.

"While the connection between cell migration and COPD has been known for many years, we have now developed a test that is simple and fast enough for clinical diagnosis," says Dr. Jiandog Wu, scientific author and collaborator.

The standard method for COPD diagnosis is known as spirometry, which tests how well the patient can breathe. According to Dr. Lin, the main limitation of spirometry is that it requires patient cooperation, which can be difficult for patients with severe conditions or who are unable to follow the procedures. Research shows that for patients diagnosed using the spirometry test, diagnoses were only correct half the time.

"The cell migration test is a more refined option since it assesses the disease at the cell function level," says Dr. Ke Yang, scientific author and collaborator. "This test can provide information to complement traditional methods for more accurate disease diagnosis and can help predict disease progression. The inexpensive and simple to perform method allows for better patient care and increased efficiencies."

A subsequent study measured the effectiveness of this test using an upgraded microchip and smartphone with specialized apps for analysis. This innovative system was used at The Vic and the Immunotrafficking lab to calculate cell migration distance in healthy participants and COPD samples.

"Smartphone-based systems offer new platforms for analysis and it is our vision that such systems have the potential to enable these tests for clinical applications," says Dr. Lin.

Dr. Santos says the team has a strong vision for the future success of this new method. "In the future, a self-test kit could be prescribed to the patient to be done at home," says Dr. Santos. "We believe this method will be successful in the diagnosis and monitoring of COPD and other diseases such as chronic kidney disease, diabetes and cancers in the years to come."

The highly-skilled team has presented and published their research internationally, in addition to being featured in a scientific press release.

COPD is a progressive disease that makes it difficult for sufferers to breathe. It is one of the most common lung diseases, with a patient's condition worsening over time as the disease progresses.

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