Researchers seek safer cystic fibrosis test

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University of Arizona researchers Cori Daines, M.D., (left), of the College of Medicine, and Eric Snyder, Ph.D., of the College of Pharmacy, are seeking a non-invasive test to measure the severity of cystic fibrosis. Credit: The University of Arizona

Researchers from The University of Arizona Colleges of Pharmacy and Medicine are teaming up to try to invent a novel non-invasive lung test for cystic fibrosis sufferers.

Eric Snyder, PhD, assistant professor at the UA College of Pharmacy, is the principal investigator on the study, "Quantification of Exhaled Condensate Using Bronchoalveolar Lavage in Cystic Fibrosis." Dr. Snyder will work with UA College of Medicine faculty members Cori Daines, MD, and Wayne Morgan, MD, on the project.

Cystic fibrosis (CF) is a disease that affects the lung. According to the Cystic Fibrosis Foundation, about 30,000 children and adults in the

United States (70,000 worldwide) suffer from CF. The disease results from a genetic alteration that lowers the function of chloride channels in the lung, which leads to a dry lung. The drier a CF patient's lungs, the more dangerous his or her disease.

The fluctuations of sodium, potassium and chloride in the lung all are important in keeping the lung wet and are of particular importance in cystic fibrosis. Studies in the past using cell lines or animal tissues have shown that the administration of a common drug used in cystic fibrosis, a beta-agonist, increases the amount of chloride on cells and this should help keep the lungs wet. The problem is that currently no easy way exists to measure the amount of chloride on a person's lung cells to optimize his or her therapy.

Today, measuring what is on lung cells requires an invasive test called bronchoalveolar lavage. Although bronchoalveolar lavage typically is used to determine the level of disease severity by exploring inflammatory markers, Dr. Snyder notes that it also could be used to collect signs of chloride, and possibly lung dryness.

During bronchoalveolar lavage, the patient is anesthetized and a tube is inserted into the lung. Next, a small amount of water is sprayed into the lung's airway and then sucked out through the tube. This fluid then can be analyzed for a variety of factors.

Bronchoalveolar lavage is invasive and carries some risk. The aim of Dr. Snyder's study is to develop a safer, non-invasive procedure that can measure some of the data that can be taken with a bronchoalveolar lavage with comparable accuracy.

The non-invasive procedure that Dr. Snyder's research will explore involves measuring signs of lung dryness by using a patient's breath that is condensed in a cooling chamber. To do this, the team first will have a

patient breathe into a machine in Dr. Snyder's laboratory in the College of Pharmacy. Breathing on this machine condenses the patient's breath in a cooling chamber so that the research team can measure the amount of sodium, potassium and chloride it contains. Immediately after this non-invasive test, the patient will go to University Medical Center for a bronchoalveolar lavage performed under the direction of Drs. Daines and Morgan.

Once the brochoalveolar lavage is completed, the team will compare the amount of sodium, potassium, and chloride ions gathered in that test to the amount gathered non-invasively in the breath test. This will allow the team to see if the non-invasive test is as accurate as the invasive technique.

"This research will provide data to further explore the development of a non-invasive tool to measure airway fluid composition," says Dr. Snyder. "It will provide important preliminary data for future, larger studies in this patient population. Our goal is to invent a non-invasive test that will aid in the assessment and treatment of cystic fibrosis."

Source: University of Arizona (news : web)