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Cystic Fibrosis Research News

Title:

Sputum versus nasopharyngeal samples for the molecular diagnosis of respiratory viral infection in cystic fibrosis: a pilot study

Lay Title: *Sputum for viral diagnosis in cystic fibrosis patients*

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What was your research question?

Can viruses be detected in the sputum of people with cystic fibrosis (CF) with the same efficiency as in deep nasal samples also called “nasopharyngeal” swab (based on a thin cotton swab like the one which is used in COVID-19 detection)?

Why is this important?

Viruses present in the airways of people with CF participate, like bacteria, in the worsening of lung function, with a risk of being hospitalised more often and a reduced quality of life. If viruses are bad for the patient, the first thing to do is to detect them as soon as signs of acute respiratory infections appear (fever, cold, difficulty breathing). To date, there are no recommendations as to which sampling method is most effective. Patients often poorly accept nasopharyngeal swabs. Sputum sampling is painless, well tolerated and in any case done at each consultation for monitoring both bacterial and fungal infections. Sputum could therefore be the ideal sample for virus testing.

What did you do?

In this pilot study, doctors from 3 CF French centres selected 30 patients suffering from an acute respiratory infection and, with their consent, 2 samples were simultaneously collected, one nasopharyngeal and one sputum. From theses samples, all known viruses (16 to 18) were searched using high-performant molecular technique (called « multiplex PCR » because it detects all these potentially present viruses in a single test.

What did you find?

Sputum and nasopharyngeal samples were collected from 25 adults (18 to 55 years old) and 5 children (2 to 15 years old). Viruses were detected for 18/30 patients (60%). The most frequently identified viruses were influenza that causes flu and rhinoviruses. On the 30 paired samples, 25 matched (83%), and the identification of the virus types was successful. Statistical analyses indicated a substantial agreement for viral molecular diagnosis between the two types of sampling methods.

What does this mean and reasons for caution?

Thanks to the patients who participated to this pilot trial, we highlighted the relevance of sputum sampling for diagnosis of respiratory viruses in CF, which is less invasive and better accepted than nasopharyngeal sampling. It is important to know if viruses are present in

patients' airways. Viruses can be responsible for 50% of lung function decline in CF. In fact they can promote the installation of bacteria, which can worsen the disease.
According to this study, we can recommend the use of sputum samples for the diagnosis of respiratory viruses in CF adults and children. Because this study goes against usual practices, the idea needs to gain consensus within the medical community. Thus only one sample will be used for bacterial, fungal and now viral diagnosis, improving patient's follow-up.

What's next?

Because our pilot study highlighted the relevance of sputum sampling, it paved the way for a larger prospective work including CF viral screening to adjust the sampling recommendations in CF. We have now already set up such a multicentric study, in 11 French CF centres, the inclusions are in progress.

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