

Cystic Fibrosis Research News

Title:

Electronic Home Monitoring Of Children With Cystic Fibrosis To Detect And Treat Acute Pulmonary Exacerbations And Its Effect On 1-Year FEV₁

Lay Title:

Using Home Spirometry Devices to Watch Over Children with Cystic Fibrosis: Can It Help Detect and Treat Pulmonary Exacerbations and Improve 1-Year Lung Function?

Authors:

Muruvvet Yanaz¹, Cansu Yilmaz Yegit¹, Aynur Gulieva¹, Mine Kalyoncu¹, Merve Selcuk¹, Burcu Uzunoglu², Gamze Tastan², Almala Pinar Ergenekon¹, Yasemin Gokdemir¹, Ela Erdem Eralp¹, Fazilet Karakoc¹, Bulent Karadag¹

Affiliations:

¹ Division of Pediatric Pulmonology; Marmara University School of Medicine, Istanbul, Turkey

² Marmara University School of Medicine, Selim Coremen Cystic Fibrosis Center, Istanbul, Turkey

What was your research question?

Could using a home spirometry device to monitor lung function help us detect and treat pulmonary exacerbations earlier, and prevent the lungs from getting worse over a year compared to usual care?

Why is this important?

People with cystic fibrosis (CF) often have sudden pulmonary exacerbations. These exacerbations may decrease lung function, reduce their quality of life, and even shorten their lifespan. They sometimes wait until their symptoms are really bad before seeing their doctor. Waiting too long to treat these symptoms can lead to poorer results. About 1 in 4 people cannot get back to their normal lung health for three months after an exacerbation. Through regular monitoring of lung functions, deterioration in respiratory functions, which is one of the most important signs of exacerbation, can be detected early.

What did you do?

We followed up two groups of children with CF -home spirometry (HSG) and usual care groups (UCG)- for a year. Both groups had routine care with quarterly clinical visits; they received usual daily treatments (including dornase alpha, hypertonic saline, vitamins, pancreatic

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enzymes, and antibiotics, except modulators because they were not covered at the time of study) and airway clearance method. Additionally, children in HSG were asked to perform the lung function test by home spirometry device twice a week. The results were transferred to the cloud system via Bluetooth simultaneously and assessed by our CF team for a significant decline.

What did you find?

We assessed the lung function of the participants, adherence to the study, and recorded the number of exacerbations. The adherence to twice-weekly home spirometry measurements was 73.3%. The lung function in HSG slightly improved by 1%, while UCG had a drop by 2.5%. But when we evaluated just children who really adhered to the home monitoring program, their lung function improved by 5% compared to a 2.5% drop in UCG. This difference was significant.

What does this mean and reasons for caution?

To our knowledge, this is the first study showing that children with CF had better lung function when they checked their lung health at home adherently. One possible reason for this might be that more children in HSG received higher number of antibiotics for exacerbations. Some studies show that CF treatment programs that catch and treat pulmonary exacerbations early can help patients maintain better lung health. Additionally, the use of home spirometry might encourage individuals to adhere to their daily treatments, potentially leading to improved lung function.

What's next?

Using the home spirometry regularly can help children with CF have healthier lungs. Home spirometry can also be effectively used in countries with limited resources and improve survival.

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<https://pubmed.ncbi.nlm.nih.gov/37748990/>