European Cystic Fibrosis Society

Journal of Cystic Fibrosis
The Official Journal of the European Cystic Fibrosis Society

Cystic Fibrosis Research News

Title:

The impact of chest computed tomography and chest radiography on clinical management of cystic fibrosis lung disease

Authors:

Carla F. Bortoluzzi[1], Eleonora Pontello[1], Emily Pintani[2], Karin M. de Winter-de Groot[3], Ciro D'Orazio†[2], Baroukh M. Assael[4], M.G. Myriam Hunink[5,6,7,8], Harm A.W.M. Tiddens[5], Daan Caudri[5,9]

Affiliations:

[1] Unità Fibrosi Cistica, Pediatria, ULSS 2 Ospedale Ca' Foncello, Treviso, Italy
[2] Centro Regionale Fibrosi Cistica, AOUI Verona, Verona, Italy.
[3] Department of Pediatric Pulmonology, Wilhelmina Children's Hospital - University Medical Centre Utrecht, Utrecht University, Utrecht, The Netherlands
[4] Adult Cystic Fibrosis Centre, University of Milano, Italy
[5] Department of Pediatric Pulmonology and Allergology, Erasmus MC - Sophia Children's Hospital, Rotterdam, The Netherlands
[6] Department of Epidemiology, Erasmus MC, Rotterdam, The Netherlands
[7] Department of Radiology and Nuclear Medicine, Erasmus MC, Rotterdam, The Netherlands
[8] Centre for Health Decision Science, Harvard T.H. Chan School of Public Health, Boston, USA
[9] Telethon Kids Institute, University of Western Australia, Perth, Australia

What was your research question?

Chest computed tomography (CT) and chest radiography are both commonly used to monitor lung damage in children with cystic fibrosis. This study aimed to investigate if these tests actually influence the therapeutic choices doctors make when treating children with cystic fibrosis.

Why is this important?

From early childhood, children with cystic fibrosis are at risk of developing lung infections. In some children this results in irreversible lung damage and a reduced life expectancy. The main goal of regular monitoring in cystic fibrosis is the early detection and prevention of such lung damage. However, there is no agreement on how lung damage is best visualised during annual check-ups. Both chest radiography and CT scans can be used; the advantage of chest radiography is a lower radiation dose, but the downside is that it is not as good in detecting early lung damage as CT scans.

Cystic Fibrosis Research News

What did you do?

Our study made use of short standardised computer based patient descriptions (i.e. clinical cases) , each of which resembled a real child with cystic fibrosis presenting at his or her annual check-up. These clinical cases were than presented to experienced doctors two times, and we monitored if the doctors changed their suggested treatment plans based on the presence or absence of information from chest radiography and/or CT scans. Importantly, if a specific investigation is not associated with any change in the management plan made by the treating doctor, this implies the investigation is not useful for the patient and should not be performed.

What did you find?

We found that doctors assessing clinical cases from the same patient on two different occasions, once with and once without radiology information, prescribed more tests, treatments with intravenous antibiotics and bronchoscopies, if they had information from a CT scan available. Information from chest radiography on the other hand did not lead to any consistent and relevant changes in doctors' suggested treatment plans.

What does this mean and reasons for caution?

The results suggest that a chest radiography done at two-yearly follow-up, as in children with cystic fibrosis does not have clinical consequences or benefit. On the other hand, the information obtained from CT scans was significantly associated with several changes in the clinical management of children with cystic fibrosis. It is important to realise that our study was not designed to test if any of those changes in the clinical management would also lead to improvements in the children's health.

What's next?

In combination with previous knowledge on the advantages and disadvantages of chest CT scans, our study suggests it is better to use CT scans than chest radiographs at two-yearly check-ups. Furthermore, future studies could use this novel design with computer based clinical cases, to explore the clinical impact of diagnostic tools in cystic fibrosis and other diseases.

Original manuscript citation in PubMed

https://www.ncbi.nlm.nih.gov/pubmed/?term=The+impact+of+chest+computed+tomography+and+chest+radiography+on+clinical+management+of+cystic+fibrosis+lung+disease

cfresearchnews@gmail.com