primary studies - published RCT

Cystic fibrosis: are volumetric ultra-low-dose expiratory CT scans sufficient for monitoring related lung disease?.

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Study design (if review, criteria of inclusion for studies)

institutional review board-approved study

Participants

20 patients with CF aged 6-20 years (eight males, 12 females). Median age was 12.6 years (range, 6.3-20.3 years), median forced expiratory volume in 1 second was 100% (range, 46%-127%) of the predicted value, and median forced vital capacity was 99% (range, 61%-123%) of the predicted value.

Interventions

patients underwent low-dose end-inspiratory or ultra-low-dose end-expiratory CT.

Outcome measures

Scans were randomized and scored by using the Brody-II CT scoring system to assess bronchiectasis, airway wall thickening, mucus plugging, and opacities. Scoring was performed by two observers who were blinded to patient identity and clinical information. Mean scores were used for all analyses. Statistical analysis included assessment of intra- and interobserver variability, calculation of intraclass correlation coefficients (ICCs), and Bland-Altman plots.

Main results

Very good agreement was observed between end-inspiratory and end-expiratory CT scores for Brody-II total score (ICC = 0.96), bronchiectasis (ICC = 0.98), airway wall thickening (ICC = 0.94), mucus plugging (ICC = 0.96), and opacities (ICC = 0.90). Intra- and interobserver agreement were good to very good (ICC range, 0.70-0.98). Bland-Altman plots showed that differences in scores were independent of score magnitude.

Authors' conclusions

In this pilot study, CT scores from end-expiratory and end-inspiratory CT match closely, suggesting that ultra-low-dose end-expiratory CT alone may be sufficient for monitoring CF-related lung disease. This would help reduce radiation dose for a single investigation by up to 75%.

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See also

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Keywords

Adolescent; Adult; Child; Respiratory Tract Diseases; Bronchiectasis; Low-Dose; non pharmacological intervention - diagn; diagnostic procedures; computed tomography;