

MDCT and MRI in bronchiectasis in older children and young adults-A non-inferiority trial

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Abstract

Purpose To compare and evaluate the usefulness of MRI with CT as radiation free alternative To compare the reproducibility of CT and MRI scores To compare MRI and CT scores with pulmonary function tests (PFT) To evaluate the role of DWI in bronchiectasis. **Methods** In this prospective study, 25 patients between 7-21 years of age with a clinical/radiological diagnosis of bronchiectasis underwent MDCT (with HRCT reconstruction) and MRI chest. MRI and CT scoring was performed using modified Bhalla score -Helbich's score by two independent radiologists for all parameters. A final consensus score was recorded. both in CT and MRI. The overall image quality of different MRI sequences to identify the pathologies was also assessed. Appropriate statistical tests were used for inter-observer agreements, and correlation amongst CT and MRI; as well as CT, MRI and PFT. **Results** Strong agreement (ICC 0.80-0.95) between CT and MRI was seen for extent and severity of bronchiectasis, number of bullae, sacculation/abscess, emphysema, collapse/ consolidation, mucus plugging, and mosaic perfusion. Overall CT and MRI scores had perfect concordance (ICC 0.978). Statistically significant (p-value <0.01) intraobserver and interobserver agreement for all CT and MRI score parameters was seen. A strong negative correlation was seen between total CT and MRI severity scores and FEV1, FVC, FEF 25-75%. DWI MR, with an ADC cut-off of $1.62 \times 10^{-3} \text{ mm}^2/\text{sec}$ had a sensitivity of 70% and specificity of 75% in detecting true mucus plugs. **Conclusion** MRI with DWI can be considered in the diagnostic algorithm for assessment of lung changes in bronchiectasis as a radiation-free non-invasive method of imaging in children, especially in follow-up.

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