primary studies - published RCT

Pulmonary gas exchange in cystic fibrosis: basal status and the effect of i.v. antibiotics and inhaled amiloride.

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

RCT, clinical status after HIVAT serving as the baseline for the crossover study.

Participants

10 CF patients (mean age 26 yrs, mean Shwachman score 86) were examined.

Interventions

High-resolution computed tomography (HRCT) and spirometry, including diffusing capacity, were performed after each gas exchange study for comparison. Examinations were done before and after home i.v. antibiotic treatment (HIVAT, 14 days) and after inhaled amiloride and placebo (14 days).

Outcome measures

Pulmonary gas exchange was studied using the multiple inert gas elimination technique. High-resolution computed tomography (HRCT) and spirometry, including diffusing capacity, were performed after each gas exchange study for comparison. Clinical status.

Main results

Before HIVAT, the mean residual volume was 182% of the predicted value, the mean vital capacity 72% pred and the mean forced expiratory volume in one second 53% pred ($p<0.001$). The dispersion of pulmonary blood flow at different ventilation/perfusion ratios (V'/Q') ((logarithmic SD of the perfusion distribution (log SDQ)), used as an index for gas exchange impairment, was increased to a mean of 0.72. No linear correlation was seen between ventilation/perfusion inequality, spirometry and HRCT ($p>0.05$). After HIVAT, log SDQ was significantly improved to 0.66 (p

Authors' conclusions

The degree of ventilation/perfusion inequality cannot be estimated from spirometry or high-resolution computed tomography. The low proportion of low ventilation/perfusion ratios indicates that the regular treatment directed towards mucus plugging of small airways is beneficial. An improvement in the ventilation/perfusion relationship was seen after home i.v. antibiotic treatment and inhaled amiloride may possibly have a further positive effect on gas exchange.

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See also

Eur Respir J. 1999 Sep;14(3):686-92.

Keywords

Adolescent; Adult; Amiloride; Anti-Bacterial Agents; Inhalation OR nebulised; Intravenous; nebuliser; non pharmacological intervention - devices OR physiotherapy; pharmacological_intervention; Tobramycin; Airway clearance drugs -expectorants- mucolytic- mucociliary-; Bacterial Infections; Respiratory Tract Infections; Infection; Home; computed tomography; ENaC antagonists - Sodium Channel Blockers; Respiratory System Agents; diagnostic procedures; non pharmacological intervention - diagn; Aminoglycosides; Respiratory Tract Diseases;