primary studies - published RCT

Cystic fibrosis: enhanced theophylline metabolism may be linked to the disease.

Code: PM3046811 **Year:** 1988 **Date:** 1988 **Author:** Knoppert DC

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

RCT

Participants

12 patients with cystic fibrosis (CF) and 16 healthy control volunteers

Interventions

Theophylline disposition (5.5 mg/kg administered intravenously) was studied. Dietary controls and logs were used to minimize the influence of food on theophylline metabolism. Control subjects were restudied in random order on two subsequent occasions after 2 weeks of either pancreatic enzymes or placebo.

Outcome measures

Theophylline and its three main metabolites, 1-methyluric acid, 3-methylxanthine, and 1,3-dimethyluric acid, were analyzed in serum and urine by HPLC

Main results

The total body clearance, renal clearance, nonrenal clearance, and volume of distribution of theophylline were significantly greater (p less than 0.05) in patients with CF than in control subjects. The increased nonrenal clearance was the result of increased biotransformation to each of the three main metabolites. Patients with CF exhibited enhanced N-demethylation and 8-hydroxylation of theophylline, pathways that appear to be mediated by two different families of P-450 enzymes. Theophylline clearance after 2 weeks of pancreatic enzyme administration in the control subjects was the same as with placebo. Possible reasons for enhanced theophylline biotransformation in CF are discussed.

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See also

Clin Pharmacol Ther. 1988 Sep;44(3):254-64.

Keywords

Adolescent; Adult; Bronchodilator Agents; pharmacological_intervention; Respiratory System Agents; Theophylline; Xanthines; Intravenous; Aminophylline;