Expression of inducible nitric oxide synthase gene in airway epithelial cells in young children with CF

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Aims: This is the first study to measure inducible nitric oxide synthase expression quantitatively in primary epithelial cells from very young children with cystic fibrosis (CF).

Methods: Cells were obtained by tracheo-bronchial brushing in 40 children with cystic fibrosis (mean age 4 SD: 2.1 ± 1.5 years) and 13 healthy, non-atopic controls (3.4 ± 2.2 years) and expression of iNOS was measured using quantitative PCR (TaqMan®) relative to the expression of β-actin.

Results: No significant difference in expression of iNOS was found in CF patients with and without bacterial colonization in broncho-alveolar lavage (BAL) (0.22 vs 0.23) however, iNOS expression was significantly lower in CF patients than in healthy children (0.75; P < 0.005 for colonized and P < 0.009 for non-colonized CF patients).

Conclusions: These results support the findings of previous studies in adult patients with advanced disease, cell lines and animal models. Our findings reflect the situation in young children without advanced disease. They indicate that low iNOS expression may be an innate defect with potentially important consequences for the local anti-microbial defense and suggest implications for a new therapeutic approach.