

Exacerbation Frequency and Clinical Outcomes in Adult Patients with Cystic Fibrosis

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Background: Despite advances in treatment of Cystic Fibrosis (CF), pulmonary exacerbations are common and contribute to significant morbidity. Whether recurrent pulmonary exacerbations lead to accelerated decline in lung function or are associated with an increased risk of mortality remains unclear.

Objectives: To determine if frequent pulmonary exacerbations are associated with greater declines in lung function, or an accelerated time to death or lung transplantation in adults with CF.

Study Design: A three-year prospective cohort study. CF patients who could spontaneously produce sputum were enrolled from 2005-2008 and stratified into groups based upon their exacerbation rates over the three-year study; those with <1 exacerbation/yr (n=140), 1-2 exacerbations/yr (n=160) and >2 exacerbations/yr (n=146). Exacerbations were defined as acute/sub-acute worsening of respiratory symptoms severe enough to warrant oral or intravenous antibiotics.

Setting: All CF specialty clinics in Ontario, Canada.

Patient Population: Study population consisted of 446 adult CF patients.

Outcomes: Patient-related factors associated with frequent exacerbations were determined, and clinical outcomes including decline of lung function and time to lung transplant or death were compared amongst the three exacerbation groups.

Results: Patients with frequent exacerbations were more likely to be female, diabetic, and have poorer baseline lung function. Patients with >2 exacerbations/year had an increased risk of experiencing a 5% decline in FEV₁ over the study period; unadjusted hazard ratio (HR) 1.47 [95% CI, 1.07 to 2.01, p=0.02], adjusted HR 1.55 [95% CI, 1.10 to 2.18, p=0.01] compared to patients with <1 exacerbation/year. Patients with >2 exacerbations/year also had an increased risk of lung transplant or death over the 3-year study period; unadjusted HR 12.74 [95% CI, 3.92 to 41.36, p<0.0001], adjusted HR 4.05 [95% CI, 1.15 to 14.28, p=0.03].

Conclusions: CF patients with frequent exacerbations appear to experience an accelerated decline in lung function, and they have an increased three-year risk of death or lung transplant.