

European Respiratory Society Annual Congress 2012

Abstract Number: 1705

Publication Number: P1480

Abstract Group: 8.2. Transplantation

Keyword 1: Quality of life **Keyword 2:** Transplantation **Keyword 3:** No keyword

Title: Hyperinflation correlates with poor exercise tolerance in recipients with advanced chronic lung allograft dysfunction

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Body: Background: Advanced chronic lung allograft dysfunction (CLAD) limits the survival after lung transplantation and reduces health related quality of life (HRQOL). Aims: The study was performed to find parameters correlating with low exercise capacity of patients with advanced CLAD. Methods: In this single-center prospective study, all patients with advanced CLAD (FEV1 <50% baseline) in our out-patient clinic were screened between 1.7.2011 and 15.11.2011 by exercise capacity, HRQOL (using SF 36, St. George, HADS), body composition, blood gas analysis, pulmonary function testing, respiratory muscle function and chest x –ray. The patients with low exercise capacity (LEC-CLAD) were defined as 6MWT < 50% predicted or use of oxygen or wheelchair/rollator. Results: 319 of 785 patients, had CLAD and 53 had the diagnosis of advanced CLAD. A single patient refused consent to this study, 52 patients were included. 19 needed oxygen or had a 6 min walk test (6 MWT) fewer than 50% predicted (LEC-CLAD). Patients with LEC-CLAD demonstrated lower forced vital capacity (1820ml vs 2380ml, p = 0.001), pathologic respiratory muscle function (P0.1/Pimax index: 0.14 vs. 0.06, p < 0.001), decreased inspiratory capacity (IC; 1190ml vs. 1620ml, p = 0.001). We were able to show a positive correlation between 6 MWT and IC (r = 0,367, p < 0.001). Patients with LEC-CLAD demonstrated a decrease in activity and social function. Conclusion: Advanced CLAD is an inhomogeneity cohort of patients showing different exercise tolerance of reduced lung function. We were able to demonstrated pronounced hyperinflation in patients with worse toleration and pathologic respiratory muscle function.