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Title: Effects of aerobic and strength training on symptoms and exercise capacity of IPF patients

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Body: Patients with idiopathic pulmonary fibrosis (IPF) have limited exercise capacity due to dyspnea, abnormal lung mechanics, pulmonary hypertension and other mechanisms. We tested the hypothesis that 24 sessions of exercise in the form of a rehabilitation program would improve six-minute walk test (6-MWT) distance, peak exercise oxygen uptake (VO2 peak) and dyspnea (Borg dyspnea index) after exertion in patients with typical IPF. We investigated possible underlying mechanisms including hypoxemia, oxidant stress and pulmonary hypertension. Subjects with IPF defined by clinical criteria were randomly assigned to a 3-month pulmonary rehabilitation program or to a control group that did not participate in rehabilitation. Before and after the 3-month rehabilitation or observation, subjects underwent 6-MWT and exercise gas exchange studies (cycle ergometry). Blood samples were obtained for 15-F2t-isoprostanes, lactate and NT-proBNP measurements immediately before and after cycle ergometry. Rehabilitation did not cause a significant increase in 6-MWT distance or a decrease in dyspnea. Subjects who completed pulmonary rehabilitation maintained VO2 peak at baseline over three months. The control group had a significant decrease in VO2 peak over the same 3 months. Plasma lactate increased significantly after ~50-watt cycle ergometry exercise testing at 0- and 3-month evaluations in both groups; this was associated with significant decreases in arterial oxygen saturation. Pulmonary rehabilitation maintained peak oxygen uptake, but did not improve exercise capacity of patients with moderately severe IPF. Low-level exercise was associated with significant hypoxemia and systemic oxidant stress.