

A 3-MONTH HIGH INTENSITY INTERVAL TRAINING EXERCISE PROGRAM IMPROVES LUNG FUNCTION IN A CYSTIC FIBROSIS PATIENT

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Background: Cardiovascular training can provide therapeutic benefit to individuals with cystic fibrosis (CF) by improving aerobic capacity and quality of life. High-intensity interval training (HIIT) has been shown to improve pulmonary function in healthy individuals. It is an effective stimulus with minimal cardiac muscle strain or pulmonary strain. Prior studies show that anaerobic training, consisting of short bouts of high intensity work, supplemented with low intensity rest is an effective form of conditioning when time limitation plays a factor in exercise. We have previously found that a combination of anatomical positional breathing, cardiovascular endurance training, and moderate strength training improved muscle strength, endurance, lung function, and body mass index in this client who had already engaged in advanced fitness programs but not high intensity programs. It remains unclear if the same principles can be tolerated with a high intensity interval training program. **Aim:** To investigate the impact of a high-intensity interval program on lung function in a patient with cystic fibrosis. **Methods:** A 3-month HIIT program consisting of two days a week of high-intensity interval training (8 rounds of 15 secs on and 2 mins-1:15 mins off) and 3 days of low to moderate intensity resistance training (50-70%). The client was a 58-year-old female with moderate chronic obstructive pulmonary disease and exocrine pancreatic insufficiency prior to the program. The program consisted of 2 days per week of high-intensity interval training (85-90%), and 1-3 days of resistance training and/or cardiovascular endurance training (50-70%) at home or in the gym. Outcomes were measured by pulmonary function tests (PFTs), 6-minute walk test (30 meters, 6MWT), modified 3-minute step test (3MST), timed body weight wall sit, and max body weight push-ups for strength testing. **Results:** The client completed the entire 3-month exercise program. FEV₁ improved 12% (56% to 68%). 6MWT distance improved 2.5 laps (22 to 24.5 laps). Modified 3-Min Step Test improved 8 steps (82 to 90 steps). Push up max increased 7 repetitions (20 to 27 reps). Body weight wall sit improved by 1 min (2 mins to 3 mins). **Conclusions:** This pilot shows that a high-intensity interval program can be feasible and well tolerated for patients with CF. While the above results are only from one individual, they are promising in that they showed improvement in lung function, muscle strength and muscle endurance. Further research is needed to determine the appropriate exercise intensity, duration, and frequency in therapeutic programs that are designed to complement routine clinical support. It also highlights that individuals with CF have the physical capabilities to exercises at higher bouts of cardiovascular demand and can benefit from different exercises built upon the same principles. We are pursuing a larger study to see if these preliminary findings are broadly applicable to those with CF of varying fitness levels and whether improvements in these parameters result in improved clinical outcomes.