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Title: Regular exercise improves airway inflammation in cystic fibrosis patients

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Body: Neutrophilic inflammation, mainly from recurrent bacterial infection, characterizes cystic fibrosis (CF) airways. Repeated inflammatory and oxidative stress insults may lead to progressive lung function decline. Exercise is part of a healthy lifestyle, but its relationship with inflammatory pattern has been poorly studied and could trigger an inflammatory response. We aim to depict the modulation of airway inflammation after a mouth of physical training. 10 subjects with mild to moderate stable CF (FEV1>50%) underwent an ergocycle constant load exercise test at 80% of their maximal load until exhaustion. After this test, they underwent one month's non-supervised physical fitness program, custom build for each of them by a certified physiotherapist, based on muscle tone and cardiovascular reinforcement. At the end of this training, they underwent once again the same ergocycle test. Sputum was sampled before and 1 hour after the two exercises and analysed for leucocyte counts and for cytokines. 5 females and 5 males completed the study with a mean exercise time of 4.6 minutes. No desaturation was reported. 8 subjects improved their mean FEV1%. The sputum neutrophils show the decrease from baseline level by 82% after one month of fitness program. The sputum IL-8 decrease by 22%. Both MMP-9 and TIMP-1 were also decreased after the one-month training. The MMP-9/TIMP-1 proportion demonstrates a trend in an up-regulation. We show that regular exercise diminished airway inflammation in stable CF subjects by down regulating the neutrophilic chemokine IL-8 and modifying the MMP-9/TIMP-1 to a non-destructive balance. We hope that this data will help our patients to be more pro-active in physical training.