LEG OXYGEN UPTAKE DURING SUB MAXIMAL EXERCISE IS NOT CHANGED AFTER SIX WEEKS OF KNEE EXTENSOR ENDURANCE TRAINING IN CHRONIC HEART FAILURE PATIENTS OR CONTROLS
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Chronic heart failure (CHF) is characterized by a lower work capacity compared to healthy controls, where not only the failing heart but also alterations in the skeletal muscles may play an important role. Since oxygen uptake during submaximal exercise (work economy) is a determining factor for the work capacity, we sought to find if there is any difference in work economy between CHF patients and healthy controls (CTR) and whether training could affect work economy.

Six CHF patients (age 66.5 ± 1.9; NYHA class 2.2 ± 0.2, EF 27.5 ± 3.7; VO2max during bicycling 1.56 l/min) and six age matched controls (age 67.7 ± 2.4; VO2max during bicycling 2.45 l/min) performed supervised one-legged knee extensor exercise (1-KE) at 70 % of maximum 1-KE work load, 4 times per week for six weeks. After the intervention, both groups were tested for maximal pulmonary oxygen uptake during 1-KE and two-legged knee extensor exercise (2-KE), using a stepwise incremental protocol. Two days later, they performed 2-KE at low intensity (LI, 20 W for both groups) and moderate intensity (MI, 39.7 ± 4.1 W for CHF and 49.0 ± 1.0 W for CTR). For determination of leg oxygen uptake, blood flow was measured in each leg by constant infusion thermodilution technique and blood were sampled to assess arterial-venous oxygen differences. Pulmonary oxygen uptake was measured continuously.

After training, VO2max during 1-KE tended to be higher in the trained leg compared to untrained leg in the CHF group (p=0.1), but not in the CTR group. At rest and during 2-KE, there were no differences in leg oxygen uptake between trained and untrained leg, nor were there any differences between groups. Leg oxygen uptake increased by 8.4 – 10.1 ml/min/W from LI to MI which was not different between legs or groups. Hence, work economy was not different in CHF compared to healthy subjects and was not altered by training.