REVERSAL OF RESPIRATORY MUSCLES DYSFUNCTION AND EXERCISE CAPACITY IMPROVEMENT AFTER CONTINUOUS-FLOW LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION

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Background: Patients with severe heart failure (CHF) are characterized by marked skeletal muscle dysfunction including respiratory muscles that have been associated to their exercise intolerance and poor outcome. Aim of this study was to investigate the effects of a continuous-flow left ventricular assist device (LVAD) implantation on exercise capacity and respiratory muscle performance.

Methods: Eight consecutive CHF patients (6Males/2Females, mean age: 45±15 years) were enrolled in the study after LVAD (HeartMate II) implantation as destination therapy (N=4, Males, Ischemic CHF) and as a bridge to transplantation / recovery (N=4, Non-ischemic CHF). All patients received optimal “reverse” remodelling medical treatment including clenbuterol in the non-ischemic CHF group. Patients were evaluated with the use of a cardiopulmonary exercise testing and respiratory function tests at 1, 3 and 6 months.

Results: A significant improvement of peak oxygen uptake (13.0±1.8 vs 15.9±2.9, ml/kg/min; p=0.002) and anaerobic threshold (8.2±1.3 vs 11.5±2.2, ml/kg/min; p<0.001) were found after LVAD implantation with no difference between the two groups. Inspiratory muscle strength was also significantly increased throughout the evaluation period in all patients (59±20 vs 93±20 cmH2O; p<0.05) with significant greater increase in non-ischemic CHF (75±26 vs 30±6, %; p<0.05).

Conclusions: A continuous-flow LVAD induces progressively significant improvement on exercise capacity and respiratory muscle performance indicating reversal of peripheral muscles dysfunction. Patients with non-ischemic CHF had a greater respiratory muscle strength improvement possibly due to additional clenbuterol peripheral effects.