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Abstract

BACKGROUND:

We hypothesised that combined aerobic training (AT) with resistance training (RT) and inspiratory muscle training (IMT) could result in additional benefits over AT alone in patients with chronic heart failure (CHF).

METHODS:

Twenty-seven patients, age 58 ± 9 years, NYHA II/III and LVEF 29 ± 7% were randomly assigned to a 12-week AT (n=14) or a combined AT/RT/IMT (ARIS) (n=13) exercise program. AT consisted of bike exercise at 70-80% of max heart rate. ARIS training consisted of AT with RT of the quadriceps at 50% of 1 repetition maximum (1RM) and upper limb exercises using dumbbells of 1-2 kg as well as IMT at 60% of sustained maximal inspiratory pressure (SPI(max)). At baseline and after intervention patients underwent cardiopulmonary exercise testing, echocardiography, evaluation of dyspnea, muscle function and quality of life (QoL) scores.

RESULTS:

The ARIS program as compared to AT alone, resulted in additional improvement in quadriceps muscle strength (1RM, p=0.005) and endurance (50%1 RM × number of max repetitions, p=0.01), SPI(max) (p<0.001), exercise time (p=0.01), circulatory power (peak oxygen consumption × peak systolic blood pressure, p=0.05), dyspnea (p=0.03) and QoL (p=0.03).

CONCLUSIONS:

ARIS training was safe and resulted in incremental benefits in both peripheral and respiratory muscle weakness, cardiopulmonary function and QoL compared to that of AT. The present findings may add a new prospective to cardiac rehabilitation programs of heart failure patients whilst the clinical significance of these outcomes need to be addressed in larger randomised studies.

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KEYWORDS:

Aerobic training; Exercise; Heart failure; Inspiratory muscle training; Rehabilitation; Resistance training

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