Respiratory Training Improves Heart Failure: A Systematic Review and Network Meta-analysis of Randomized Controlled Trails

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Background

Heart failure is a major cause of death from heart disease. Patients are often bothered by decreased endurance and difficulty breathing when performing their daily activities, symptoms leading to a lower quality of life. Care guidelines have recommended exercise as a supportive therapy for heart failure, but there is no clear evidence supporting the effect of non-machine-assisted traditional respiratory training.

Objective

To determine the effect of the non-machine-assisted traditional respiratory training, including qigong, yoga and aerobic exercise, and machine-assisted respiratory training on physical effect and QoL in patients with heart failure.

Methods

A search was conducted of 10 electronic databases and unpublished papers (gray literature). Inclusion criteria were (a) heart failure and (b) RCT. There were seven categories of interventions, including inspiratory muscle training (IMT), IMT_L (10~15%), IMT_M (30~40%), IMT_H (60% or with aerobic exercise), aerobic/weight exercise training (AT), relaxed form of breathing (RB, breathing, yoga or qigong), and usual care. Three outcomes were analyzed: peakVO2, 6MWT, and QoL. Random effect network meta-analysis was used to analyze data. The side-splitting model was used to test for inconsistency of data, and effect size was determined based on the mean rank calculated by using SUCRA.

Results

A total of 948 subjects, 657 males (66.8%), from 22 randomized controlled trials were included in the study. Eggerˊs test showed no significant differences. The SUCRA- based rankings of effect sizes, compared to usual care, for machine-assisted training, IMT_H in 6MWT and peak VO2 all ranked first. The second was the non-machine- assisted training, AT, with 6MWT and peak VO2. The third was RB in 6MWT, and IMT_M in peak VO2.

Conclusions

For machine-assisted training, IMT_H improves physical capacity, cardiorespiratory fitness, and QoL, and IMT_M improves QoL and activity performance in hospital-based patients with heart failure. After returning home, non-machine-assisted training can be used to continuously improve the symptoms of heart failure. AT and RB enhance physical capacity and cardiorespiratory fitness. In addition, RB improves QoL.