Effect of concurrent aerobic and resistance circuit exercise training in Japanese older adults

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ABSTRACT

**PURPOSE:** This project evaluated the effects of a 12-wk community-based circuit exercise training program using the Thera-Band Exercise Station on fitness in Japanese older men and women. Results of this study were compared to our previous study of a similar program using hydraulic exercise machines.

**METHODS:** Participants were divided into: exercise group (n=22; 67.7 ± 4.7 yr) and a non-exercise control group (n=17; 70.3 ± 9.1 yr). The exercise procedure was a 12-wk, 3 d/wk supervised program consisting of 10 min warm-up, 30-min of hydraulic resistance exercise training, and 10 min cool-down. Results indicated that machine-based circuit training that incorporates aerobic and resistance training elicits improvements (p<0.05) in cardio-respiratory fitness, muscular strength, and body composition for older adults.

**RESULTS:** The exercise group demonstrated increases (p<0.05) in 30-sec arm curl (15.2%), 30-sec chair stand (12.5%), timed up-and-go (8.1%), functional reach (24.7%), 12-min walk (5.3%), and sit-and-reach (24.7%). Although body weight did not change, fat (kg) decreased by 3.4% for the exercise group. Attendance rate for the exercise sessions was 87%. There were no changes in any variables for the control group. Previously, we published (Takeshima et al., 2004) results of a similar circuit training program using the Thera-Band Exercise Station on Japanese older adults.

**CONCLUSIONS:** Incorporating both aerobic and resistance training via the Thera-Band Exercise Station is an effective means to improve multiple aspects of fitness in older adults and these improvements are similar to those resulting from use of larger and more expensive hydraulic exercise machines.

INTRODUCTION

Previously, we evaluated the effects of aerobic and resistance training via hydraulic resistance machine-based circuit training in Japanese older adults on multiple aspects of fitness (Takeshima et al., 2004). Volunteers (n=35, aged 68.3 ± 4.9 yr) were randomized into two groups: a circuit training group and a non-exercise control group. The exercise procedure was a 12-wk, 3 d/wk supervised program consisting of 10 min warm-up, 30-min of hydraulic resistance exercise training, and 10 min cool-down. Results indicated that machine-based circuit training that incorporates aerobic and resistance training elicits improvements (p<0.05) in cardio-respiratory fitness, muscular strength, and body composition for older adults.

Therefore, circuit training is an effective way to round out the exercise program that can be utilized as a means to improve health-related components of fitness in older adults. However, such machines are expensive and require a large amount of space. It is also challenging to conduct such programs in group settings which are appealing to older adults.

The Thera-Band Exercise Station (Hygenic Corporation, Akron, OH) offers a relatively inexpensive means by which circuit training can be conducted in group settings with little requirement for space. However, it is unknown whether the device can be effectively used in a circuit training fashion to improve health and fitness in older adults.

METHODS

**Participants**

Healthy, but sedentary, older adults were recruited via newspaper advertisements in Nagoya, Japan. Following baseline measurements of functional fitness, body composition, aerobic capacity, and muscular strength, the participants were divided into: an exercise group (n=22; 67.7 ± 4.7 yr) and a non-exercise control group (n=17; 70.3 ± 9.1 yr).

**Intervention**

The exercise group participated in a 12-wk, 3 d/wk supervised program consisting of 10 min warm-up, 30-min of hydraulic resistance exercise training, and 10 min cool-down. Results indicated that machine-based circuit training that incorporates aerobic and resistance training elicits improvements (p<0.05) in cardio-respiratory fitness, muscular strength, and body composition for older adults.

**RESULTS**

For the 12-wk program, the exercise group demonstrated increases (p<0.05) in 30-sec arm curl (15.2%), 30-sec chair stand (12.5%), timed up-and-go (8.1%), functional reach (24.7%), 12-min walk (5.3%), and sit-and-reach (24.7%). Although body weight did not change, fat (kg) decreased by 3.4% for the exercise group. Attendance rate for the exercise sessions was 87%. There were no changes in any variables for the control group. Previously, we published (Takeshima et al., 2004) results of a similar circuit training program using hydraulic exercise machines in 35 older adults (68.3 ± 4.9 yr). Results were not different between these two programs.

**CONCLUSIONS**

Incorporating both aerobic and resistance training via the Thera-Band Exercise Station is an effective means to improve multiple aspects of fitness with a single exercise program when performed at a moderate intensity. Furthermore, these improvements are similar to those resulting from use of larger and more expensive hydraulic exercise machines. This program provides a relatively inexpensive means by which circuit training can be conducted in group settings with little requirement for space and could feasibly be performed at retirement communities, senior centers, as well as in home settings.

REFERENCES


Supported by a grant from Hygenic Corporation and Performance Health