THE EFFECTIVENESS OF A MANUAL RESISTANCE VS. A WEIGHT RESISTANCE TRAINING PROGRAM ON AEROBIC POWER

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ABSTRACT

Previous research indicated that high intensity and low volume resistance training programs are minimally effective for improving aerobic power. Conversely, with programs at low intensity and of increased volume, small improvements in aerobic power have been observed, specifically with circuit weight training protocols. Previous studies examined the effects of traditional weight training, isometric, isokinetic, and plyometric training programs on aerobic power. However, the effects of manual resistance training (MRT) on aerobic power have not been well studied. The purpose of the study was to investigate the effects of a moderate-intensity and high-volume MRT program and an identical weight resistance training (WT) program on aerobic power. METHODS: Physically active college males (N = 44) and females (N = 36) were randomly assigned to either the MRT or WT group. Both groups completed three training sessions per week for 14 weeks. The MRT and WT programs were identical in the number of exercises, sets, reps, and rest intervals. A single training session consisted of four sets of eight exercises, with four rest intervals. All exercises were performed with 2 kg resistance. The maximum oxygen uptake (VO2max) was measured at baseline and following training using a treadmill running to exhaustion test.$^†$ CONCLUSION: For those data, a moderate-intensity and high-volume resistance training program did not elicit an improvement in aerobic power, and sex differences were not observed. Resistance training is a valid alternative in improving aerobic power, specifically with a program that has a higher resistance volume. PRACTICAL APPLICATION: The MRT program may provide a cost-effective alternative training method for improving the aerobic power of females.

INTRODUCTION

• High intensity and low volume resistance training programs are minimally effective for improving aerobic power
• Small improvements in aerobic power have been observed with programs of low to moderate intensity and increased volume; specifically with circuit weight training protocols
• Manual Resistance Training (MRT) – Partnered exercise – Lifter and Spotter – Resistance provided by Spotter – Simulate most traditional resistance training exercises – Minimal equipment needed
• No scientific research has been reported on the effectiveness of MRT on aerobic power

PURPOSE

The purpose of the study was to investigate the effects of a moderate-intensity and high-volume Manual Resistance Training (MRT) program and an identical weight resistance training (WT) program on aerobic power (VO2max).

METHODS

• Aerobic Power – Pre- and Post-training by indirect calorimetry during a treadmill running to exhaustion test
• N = 80 physically active college students were randomly assigned to either the MRT or the WT group
• 14-week periodized training program with 3 training sessions/week
• MRT and WT groups performed identical training programs – Each training session was 6 to 9 exercises – All exercises were performed with 2-4 sets of 8-12 repetitions – MRT and WT training sessions had same order of exercises, number of sets, reps, and rest intervals

RESULTS

• Pre- and post-test data were analyzed using an ANOVA with repeated measures
• At baseline, there were no significant differences between the MRT and WT groups for age, height, weight, or body fat (P > 0.60)
• Significant difference between males and females for height, weight, body fat (P < 0.003), and VO2max (P < 0.001)
• Male absolute VO2max was significantly different between MRT and WT groups
• VO2max was similar following training for the MRT males (P > 0.38), WT males (P > 0.55), and WT Females (P > 0.12)
• Significant improvement (P < 0.05) in VO2max for MRT females

CONCLUSION

• A 14-week periodized resistance training program elicited minimal improvements of aerobic power in college students
• For females, a MRT program may provide aerobic benefits compared to a WT program
• Despite limited changes of aerobic power, MRT may be similarly effective to WT for improving other aspects of performance

PRACTICAL APPLICATION

MRT provides a cost effective alternative training method for poorly equipped facilities or supplemental training method to conventional weight based resistance training and may improve aerobic power.

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