EFFECT OF EXERCISE ON BLOOD PRESSURE IN OLDER PERSONS: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT
This randomized controlled trial studied the effects of exercise on blood pressure in older persons with hypertension. The participants were older than 65 years of age and had untreated hypertension. The blood pressure of the participants was measured before the study. Then participants completed an aerobic and resistance training program and then measured for blood pressure changes. The results showed a significant drop in diastolic blood pressure only.

METHODS & MATERIALS
Participants:
• 115 participants
• 55-75 years old
• Mild untreated hypertension
• Recruited through newspaper ad
• Systolic blood pressure of 130 to 159 mmHg and/or diastolic blood pressure of 85-99 mmHg

Exclusion criteria:
• Cardiovascular disease or other serious illness
• EKG abnormalities indicative of myocardial infarction
• Smoking
• Diabetes mellitus
• Regular moderate-intensity exercise greater than 90 min a week

Aerobic/Strength Pretesting:
• Peak oxygen measure by Vmax 229
• Treadmill started at 4.8km/h and at 0% grade and raised 2.5% every three minutes (stopped at volitional fatigue)
• Strength assessed by 1 rep max on 7 exercises

Intervention:
Treatment Group
• 3x per week
• 45 min aerobic exercise
• 2 sets of 10-15 reps per exercise at 50% 1RM.

Control Group
• Given both diet and exercise programs consistent with conventional treatment

RESULTS
• Both the control group and the treatment group had a decrease in systolic and diastolic blood pressure.
• The diastolic blood pressure was the only significant difference between the two groups dropping more in the treatment group.

DISCUSSIONS & LIMITATIONS
The effects of exercise on blood pressure in the elderly may be limited in this study due to: arterial stiffness with aging, the control group also lowered their blood pressure so no concrete conclusions can be drawn, and the control group may have been more conscious about their blood pressure because of the continual monitoring done in the study.

CLINICAL SIGNIFICANCE
The article is relevant for physical therapy because it is one step closer to showing the effects exercise has on the elderly. It is showing that PT is needed to help educate patients and begin intervention for patients to obtain healthier lifestyles that includes the management/reduction of blood pressure. However, this article suggested that this intervention would be to earlier in their lives because of arteriosclerosis due to aging. This also opens the door to research patients who have different types of hypertension and not just hypertension stage one. This article brings up an interesting point about arteriosclerosis. The article proposed that arteriosclerosis might be the reason why the exercise regimen did not have a significant effect on the systolic blood pressure of the participants. This is to say the exercise did not have other physiological benefits to the participants but the blood pressure was not significantly different in the two groups besides the diastolic blood pressure.

CONCLUSION
Because of aortic and arterial stiffness, older persons may be resistant to exercise improvements in systolic blood pressure. Other improvements included general appearance, body composition, and body weight reduction. This study showed a slight correlation with changes in body composition and reduction in blood pressure. This suggests body composition may be the pathway in which exercise training improves cardiovascular health in the elderly.

SUMMARY
The effects of exercise on blood pressure in the elderly still need to be researched further. There are many physiological benefits that have been already proven such as strength and endurance and its impact on the older population; however, exercise has not been proven concretely to reduce blood pressure in the elderly. This does not suggest that exercise is unfavourable to the older population, just that the effect on blood pressure is still understudied. PTs should understand the best evidence that is out there on this subject in order to implement an appropriate exercise program.

ARTICLE 1 & EVIDENCE
• Supports original article showing a decrease in diastolic blood pressure
• Also showed a decrease in systolic blood pressure

ARTICLE 2 & EVIDENCE
• Specifically looked at Tai Chi's effects on blood pressure
• No effect on systolic or diastolic blood pressure
• Supports and refutes original article

SUMMARY
The effects of exercise on blood pressure in the elderly still need to be researched further. There are many physiological benefits that have been already proven such as strength and endurance and its impact on the older population; however, exercise has not been proven concretely to reduce blood pressure in the elderly. This does not suggest that exercise is unfavourable to the older population, just that the effect on blood pressure is still understudied. PTs should understand the best evidence that is out there on this subject in order to implement an appropriate exercise program.

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