CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)

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Project Number

J1023

Project Title

Blood in Action: The Effect of Exercise on Blood Pressure and Pulse Rate

Abstract

Objectives/Goals

The goal of this experiment is to determine the immediate and short-term effect of different levels of exercise on blood pressure and pulse rate. It was hypothesized that blood pressure and pulse rate would rise due to exercise, and more rigorous exercise would raise both blood pressure and pulse rate higher than mild exercise. It was further hypothesized that pulse and blood pressure would take longer to return to their resting measurements after the high-intensity exercise.

Methods/Materials

Participants of the same gender and age were asked to complete ten minutes of mild exercise by walking, and ten minutes of more vigorous exercise by jumping rope. Using a digital blood pressure/pulse cuff, measurements of pulse rate and blood pressure were taken before the exercise, immediately after the exercise, and at regular intervals up to thirty minutes after the exercise. The data was recorded and analyzed.

Results

Exercise elevated both blood pressure and pulse rate, increasing more after jumping rope than after walking. Immediately after jumping rope, the pulse rate was about twice as high as the immediate pulse rate after walking. Blood pressure after jumping rope increased about 46% and 61% for systolic and diastolic, respectively, over walking. Additionally, it took longer for pulse rate and blood pressure to return to their resting measurements after jumping rope than after walking. The pulse and blood pressure after walking had returned to normal after a thirty-minute rest, but after jumping rope neither had returned to normal after a thirty-minute rest.

Conclusions/Discussion

Based on the data collected and the results of this study, all three parts of the hypothesis should be accepted. A larger sample size and control over factors such as size, fitness level, diet, and accuracy of measurements would increase the reliability of this experiment. To find out more about the relationship between exercise and blood pressure and pulse rate, similar experiments could be designed. Comparisons after completing the same activity for a prolonged period of time versus a short period of time could be made. It would also be interesting to see if the results of this experiment would stay the same if comparing age groups, genders, or fitness levels. This information could be helpful in creating safe exercise plans and healthy lifestyles.

Summary Statement

Exercise increases blood pressure and pulse rate with more rigorous exercise having a larger effect both immediately and 30 minutes after the exercise.

Help Received

Mother took pictures and helped with measurements in laying out the display board