



The Effects of Creatine on Blood Pressure Before, and After High Intensity Strength Training

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ABSTRACT

It is known that systolic blood pressure (SBP) drops five to seven mmHg for 22 hours immediately after a workout in individuals who have moderate hypertension, and that in individuals with optimal blood pressure (BP), one can expect to see a drop of four to five mmHg for over the following 22 hours. Creatine (CRE), one of the most recognized supplemental aids to enhance performance of high-intensity exercise, has convincingly substantiated its ergogenic potential (Naderi et al. 2016). However, little has been researched on the connection between creatine and blood pressure. The purpose of this study was to examine the effects of CRE on BP after a bout of high intensity strength training on Division III football players at Gustavus Adolphus College. This study is a one sample research design. Each athlete had their blood pressure measured four total times. One resting BP was taken before the consumption of CRE and the other was taken 18-22 hours after the consumption of creatine. The same was done when each subject participated in the control group as well. The subjects were given the creatine or placebo (control) at random for their first trial and then given the opposite for the second trial one week later. The independent variable was consumption of CRE. The dependent variables were SBP and diastolic blood pressure (DBP). The difference in SBP and DBP between the trials were calculated and analyzed using a paired sample *t*-test. Results showed that CRE trial BPs were slightly higher than in control trials although the difference was not significant ($p < 0.05$). The results of the study gave a better understanding of the effects of CRE on BP after a high intensity strength training session. **IRB # 1516-0105**

TABLE 1 - SEQUENCE OF PROCEDURES

1. Develop International Review Board Application

2. Recruit Subjects

- Contact potential subjects at Gustavus Adolphus College.
- All subjects will be voluntary.
- Obtain 7 subjects.
- Have participants sign consent form.

3. Collect Data

- Brief subjects on experimental procedure.
- Assign participants to take creatine or placebo at random
- Test blood pressure before and again 18-22 hours after a high intensity bout of strength training.
- Record data.
- Have the participants take the opposite drink mixture the second time they are tested.
- Record data.

4. Analyze Data

- Statistical analysis of data (paired sample *t*-test).
- Inform participants of results and conclusions of study.

Sequence of events

- Fill out consent forms
- Take resting blood pressure
- Take creatine or control drink mixture
- Complete the full strength training workout
- Have client return 18-22 hours later to take resting blood pressure

STATEMENT OF PURPOSE:

The purpose of this experiment is to examine the effects of creatine on blood pressure after high intensity strength training

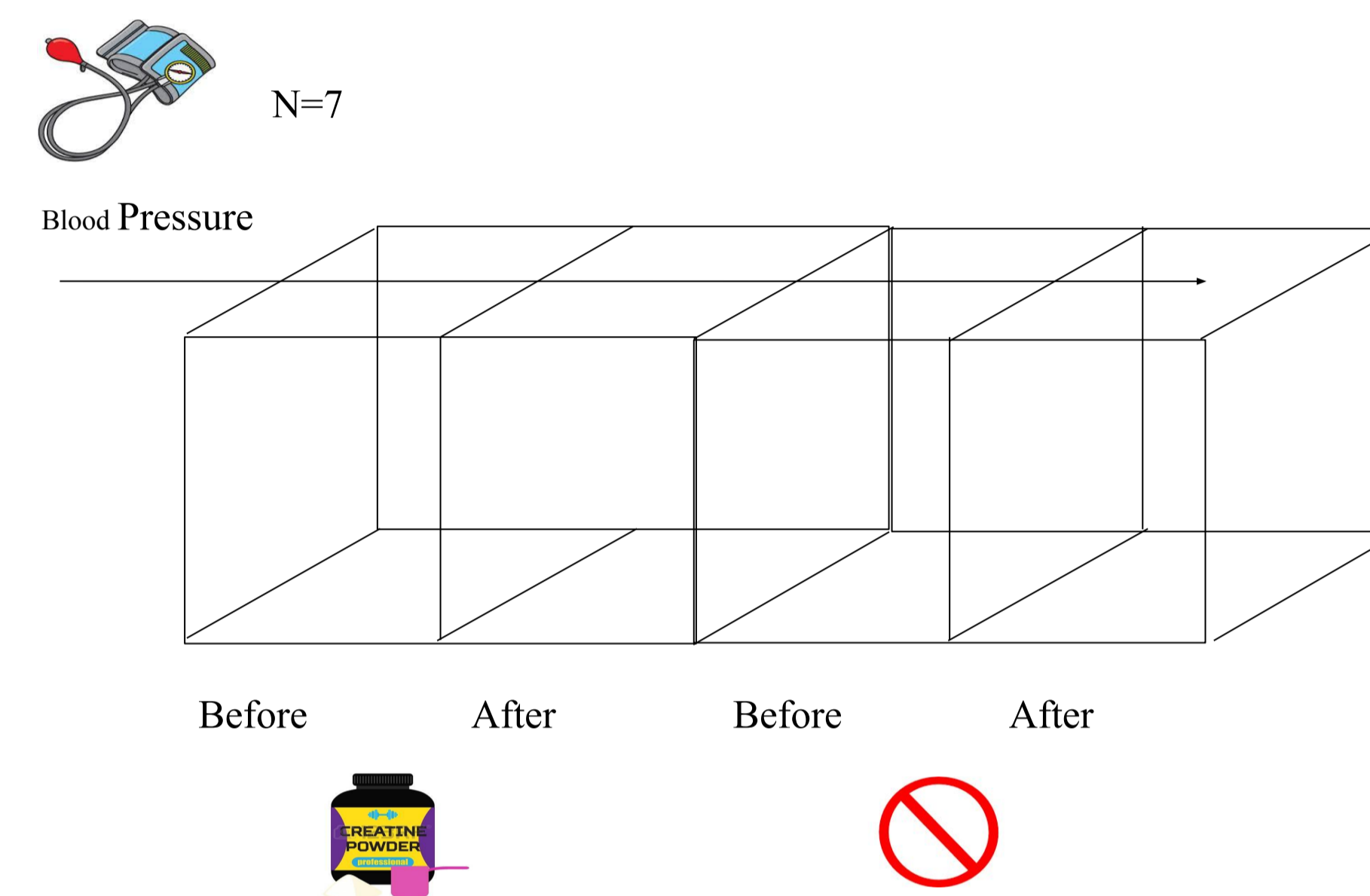


Figure 1. Illustration of the parallel group design indicating that each participant was measured for blood pressure twice for each trial (with a creatine supplement or the control).

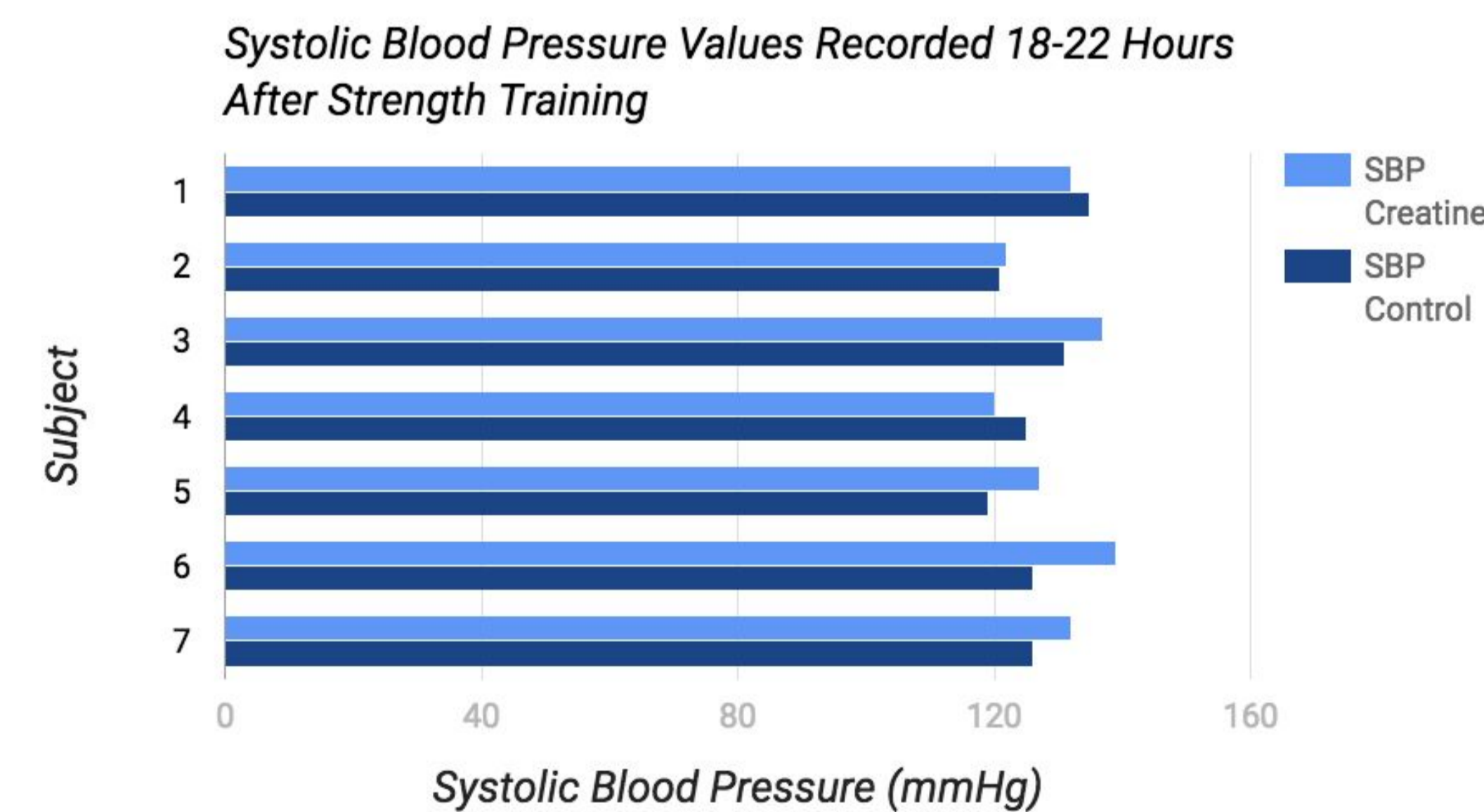


Figure 2. Systolic blood pressure measurements taken after both trials (creatine and control) are depicted above for each individual subject. Five out of the seven subjects recorded higher systolic blood pressures after taking creatine.

RESULTS AND CONCLUSIONS

- Paired Sample T-Test ($p < 0.05$)
- No significant differences were observed when comparing the measurements of systolic and diastolic blood pressures taken 18-22 hours after creatine intake and the measurements taken 18-22 hours after no creatine.
- Limitations
 - Small sample size
 - Compounding variables such as nicotine and caffeine that were potentially taken before measurements
- Future Direction
 - Obtain a larger sample size
 - Perform study on women
 - Perform study on non-athletes

Based on the results of this study, collegiate football players at Gustavus Adolphus College may have seen an increase in their blood pressure due to creatine intake, however the difference in blood pressure measurements between tests was not significant.



Table 1

Descriptive Characteristics of the Sample (N = 7)

Characteristics	M	SD
Creatine SBP Before	129.5714	3.15474
Creatine SBP After	129.8571	7.19788
Control SBP Before	128.5714	4.57738
Control SBP After	126.5714	5.59336
Creatine DBP Before	75.8571	7.66874
Creatine DBP After	76.8571	5.89996
Control DBP Before	73.8571	8.17371
Control DBP After	72.4286	6.24118

Note. SBP = Systolic Blood Pressure; DBP = Diastolic Blood Pressure