# The Effects of Nitric Oxide on Responses to a Maximal Stress Test

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## Abstract

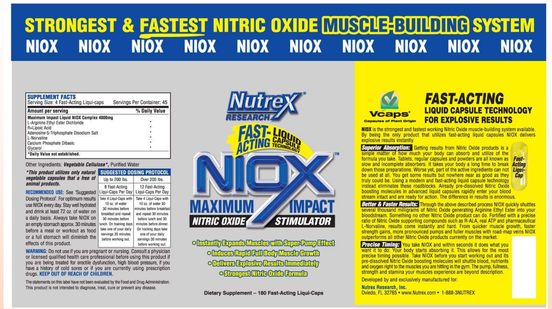
**INTRODUCTION: Maximal oxygen consumption ($VO_2$ max) is the maximum capacity of the body to transport and utilize oxygen during incremental exercise. PURPOSE: The purpose of this study was to determine the effects of supplementing nitric oxide has on an individual performing a $VO_2$ max test. METHODS: Five men (mean age 23.2 ± 1.7 years, height 71.2 ± 2.2 inches, weight 93.12 ± 3.9 kg) that attend The University of Texas at Arlington volunteered to participate in this study. Each subject had blood pressure taken manually with a stethoscope and blood pressure cuff at rest (mean systolic pressure 114.6 ± 8.4 mmHg, diastolic pressure 74.6 ± 2.6 mmHg). Before each subject performed a graded exercise test on the treadmill, they had the informed consent form read to them and given a questionnaire. Upon completion of the questionnaire each subject signed the informed consent form. Next, each subject was given either the supplement (Nitric Oxide) or the control (Vitamin-C) and waited 30 minutes before the graded maximal test could be performed. Prior to the exercise, resting measurements of heart rate (HR), blood pressure (BP) were taken. During each test heart rate (HR), blood pressure (BP), and rate of perceived exertion (RPE) were recorded every 3 minutes. The subjects went through the same protocol with the other supplement on a separate day within 3 days.**
**RESULTS: The t-test was used to analyze the data in the graded exercise test showed no significant differences between $VO_2$max (p = 0.555), SBP (p = 0.134), DBP (p = 0.260), HR (p = 0.454), and total time of the exercise (p = 0.604). The mean placebo $VO_2$max resulted in 39.76 ± 4.8 mL/kg/min, systolic blood pressure (SBP) max 184.2 ± 10.6 mmHg, diastolic blood pressure (DBP) max 78.8 ± 5.4 mmHg, max heart rate (HR) 190.4 ± 6.8 BPM, and time 11:08 ± .02 minutes. The mean nitric oxide supplementation of $VO_2$max resulted in 38.8 ± 4.2 mL/kg/min, systolic blood pressure (SBP) max 177 ± 2.4 mmHg, diastolic blood pressure (DBP) max 73.8 ± 5.2 mmHg, max heart rate (HR) 187.2 ± 9.7 BPM, and time 11:20 ± .04 minutes.**
**CONCLUSION: These results indicate that there is no significant difference in supplementing nitric oxide during $VO_2$ maximal testing.**

## Purpose

**The purpose of this study was to determine the effects of supplementing nitric oxide has on an individual performing a $VO_2$ max test.**

## Methods

**Five men (mean age 23.2 ± 1.7 years, height 71.2 ± 2.2 inches, weight 93.12 ± 3.9 kg) that attend The University of Texas at Arlington volunteered to participate in this study. Each subject had blood pressure taken manually with a stethoscope and blood pressure cuff at rest (mean systolic pressure 114.6 ± 8.4 mmHg, diastolic pressure 74.6 ± 2.6 mmHg). Before each subject performed a graded exercise test on the treadmill, they had the informed consent form read to them and given a questionnaire. Upon completion of the questionnaire each subject signed the informed consent form. Next, each subject was given either the supplement (Nitric Oxide) or the control (Vitamin-C) and waited 30 minutes before the graded maximal test could be performed. Prior to the exercise, resting measurements of heart rate (HR), blood pressure (BP) were taken. During each test heart rate (HR), blood pressure (BP), and rate of perceived exertion (RPE) were recorded every 3 minutes. The subjects went through the same protocol with the other supplement on a separate day within 3 days.**




## Results

**The t-test was used to analyze the data in the graded exercise test showed no significant differences between $VO_2$max (p = 0.555), SBP (p = 0.134), DBP (p = 0.260), HR (p = 0.454), and total time of the exercise (p = 0.604). The mean placebo $VO_2$max resulted in 39.76 ± 4.8 mL/kg/min, systolic blood pressure (SBP) max 184.2 ± 10.6 mmHg, diastolic blood pressure (DBP) max 78.8 ± 5.4 mmHg, max heart rate (HR) 190.4 ± 6.8 BPM, and time 11:08 ± .02 minutes. The mean nitric oxide supplementation of $VO_2$max resulted in 38.8 ± 4.2 mL/kg/min, systolic blood pressure (SBP) max 177 ± 2.4 mmHg, diastolic blood pressure (DBP) max 73.8 ± 5.2 mmHg, max heart rate (HR) 187.2 ± 9.7 BPM, and time 11:20 ± .04 minutes.**

## Results (cont'd)

**Table 1: Related Variables**

| Placebo (Vitamin-C) | | Nitric Oxide (NiOx) | |
|---|---|---|---|
| $VO_2$max (mL/kg/min) | 39.76 | $VO_2$max (mL/kg/min) | 38.8 |
| Systolic Blood Pressure max (mmHg) | 184.2 | Systolic Blood Pressure max (mmHg) | 177 |
| Diastolic Blood Pressure max (mmHg) | 78.8 | Diastolic Blood Pressure max (mmHg) | 73.8 |
| Heart Rate max (BPM) | 190.4 | Heart Rate max (BPM) | 187.2 |
| Duration (minutes) | 11:08 | Duration (minutes) | 11:20 |

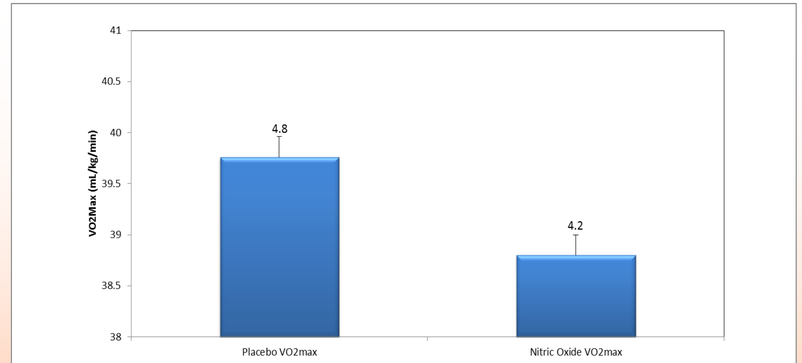



**Figure 1: The Comparison Between the Placebo Vitamin-C and Nitric Oxide Supplementation on VO2Max**

## Conclusions

**These results indicate that there was no significant difference in $VO_2$max, SBP, DBP, HR, and the duration of the exercise test. The results also indicate that there was no significant difference in supplementing nitric oxide during $VO_2$ maximal testing.**