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The effect of ginseng supplement on heart rate, systolic and diastolic blood pressure to resistance training in trained males

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Abstract *Objectives:* Ginseng Panax has been used for centuries in Chinese medicine as source of health and stamina. We want to examine the affect of ginseng supplement on heart rate, systolic; blood pressure and diastolic blood pressure in trained athletes at rest, during and after resistance; training.
Methods: Twenty four athletes entered this protocol. Subjects (age 23.96 ± 1.82; weight 84.5 ± 9.86; height 175.37 ± 5.36) divided randomly in 2 groups: ginseng group (n = 12) and placebo group (n = 12). Each of them received 2 capsules of ginseng for 4 weeks. Before intervention, heart rate, systolic and diastolic Blood Pressure at rest, immediately after exercise, 15, 30, 45, and; 60 min after exercise were measured. They performed training program while taking; ginseng for 4 weeks and again heart rate, systolic and diastolic blood pressure measurement at; those time points which was mentioned above were taken.
Results: The analysis of SPSS showed that heart rate and diastolic blood pressure in ginseng; group only at time test were significantly different from placebo group and systolic blood pressure at rest time, test time and 60-minute after exercise increased significantly differ between ginseng and placebo group ($p \leq 0.05$) and other time points exception of these times that mentioned above were not significantly different ($P > 0.05$).
Conclusions: We conclude that ginseng complement help improve blood circulation during exercise, it decreases peripheral vascular resistance, and help oxygen delivery to actively

Abbreviations: SBP, systolic blood pressure; DBP, diastolic blood pressure; TRE, time rest; TTE, time test; T15, 15 minutes; T30, 30 minutes; T45, 45 min; T60, 60 min after exercise; HR, heart rate.

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contracting muscles. Also, it may influence recovery blood pressure after lifting heavy weight.

Introduction

Ginseng (Genus Panax) root has been a popular Chinese medicine that has been consumed as a natural ergogenic aid in many countries by athletes. It's been shown that ginseng can help to improve overall health. The active parts of ginseng are tnterponoid glycosides or saponins, termed ginsenosides.[1] According to previous studies ginseng has antioxidants effect, and may modulate corticotropin and cortisol production, immune system neuroendocrine activity, and carbohydrate and lipid metabolism, and stimulates nitric oxidation production in cardiovascular system.[2]

Some studies have reviewed ginseng effects on cardiovascular system. Animal studies suggest that ginsenosides may have biphasic actions on blood pressure, at the beginning of activity BP decreases and then increases.[3] Lei and Chiou (1986) found the extracts of *Panax notoginseng* decreased systemic blood pressure in rats and rabbits.[4] Many in vivo studies have suggested that ginseng may reduce BP in a dose-independent manner.[5]

Previous studies searched the effects of ginseng supplement on performance improvement during endurance exercises in athletes. Engels et al. (2001) showed ginseng couldn't show any differences between groups (19 active females with consuming Panax ginseng CA Mayer vs. parallel group design) in power during 30-second Wingate test or heart rate response.[6] After that Liang et al. (2005) found that ginseng treatment associated with a reduction in blood pressure and VO2 during exercise.[7]The American College of Sports Medicine (ACSM) recommended that resistance training has health-related benefits for all of People.

The past studies explored the effect of ginseng in athletes, while performing aerobic protocol exercises. There is little evidence that shows blood pressure-lowering affect in athletes who use ginseng complement with resistance training. On the other side, the affect of ginseng supplement on heart parameters such as HR and BP in strength training has not been studied among trained athlete. Human studies have not achieved consistent results in this field. So, we want to know the benefit of this plant on cardiovascular system after resistance exercises. The objective of this study was to study ginseng effectiveness in athletes who take part in resistance training.

Subjects and methods

Subjects

24 Healthy male athletes between the ages of 21 and 26 who have at least 2 months of resistance training experience were recruited for the study. The inclusion criteria of the participants were having good general health, no smoking, no use of sport supplement and age range of 18—27 years old. Individuals with hypertension, asthma, diabetes, bronchitis, anemia, cardiac problems, kidney or liver diseases or any other major diseases, on with body mass index $\geq$24 kg/m2 were excluded from the study. Figure 1 shows the Consolidated Standards of Reporting Trials flow diagram.

All participants read and signed an informed consent form after being informed of the testing and training procedures that would be performed during the study. Subjects were randomly divided in to 2 groups. Group1 ($n = 12$) received ginseng capsule, another group ($n = 12$) received placebo. All participants self-reported that they were not taking any medication or herbal supplements. There were no significant differences ($p > 0.05$) between groups in height, age, or weight before intervention (Table 1). The subjects were asked to avoid caffeine consumption and not to change their usual diet before during each trial.

Ginseng supplement

Each subject took either two ginseng or placebo capsules (200 mg/day) daily for 30 days. Previous studies examined different dosage of ginseng in different duration of treatment. Liang et al. examined the effectiveness of 1350 mg Chinese ginseng in 30 days and found that ginseng led to reduction in blood pressure during exercise in 29 active males and females.[7] McNaughton found significantly improved in recovery heart rate and oxygen uptake in runners who consumed ginseng 200 mg/day for 6 weeks.[8] Like authors such as Engle and Hsu et al., we used 400 mg/day in 4 weeks ginseng supplement. Each ginseng capsule contained: standardized Ginko biloba, extract GK501 (60 mg) adjusted to 24% ginko-flavone- glycosides, standardized Panax ginseng C.A.Meyer extract G115 (100 mg) adjusted to 4% ginsenosides, Excip. Pro caps.gelatin. Both Placebo capsules and ginseng capsules were produced by the same factory. Placebo capsules looked similar to ginseng capsule and has all ginseng capsule ingredients except Panax ginseng C.A.Meyer extract G115. Subjects were instructed to take two capsules after eating breakfast with one glass of water and not changing their regular diet during treatment period. They were asked to recall if they had any digestive problems during one month.

Testing procedures

In the introductory session, subjects were informed about the study in general. Anthropometrics measurements were assessed only at baseline (Table 1). Body weight was measured without shoes or outerwear within precision of 0.1 kg.