

Research Paper

Comparison of the Effect of 6 Weeks of Creatine and Ginseng Supplementation on Blood Ammonia, Lipoprotein and Homocysteine of Male Players of Iran's EPE Fencing Team in 2021



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ABSTRACT

Background and Aim Food and sports supplements are used by athletes all over the world, and correct and optimal consumption improves performance and prevents sports injuries. In this regard, creatine and ginseng supplements can be effective on physiological indicators and sports performance. Therefore, considering that no research has been done on the use of these supplements on blood indicators on fencers. The present study compares the effect of creatine and ginseng supplements on blood ammonia, HDL, LDL and homocysteine indices of the male players of the Iranian Epe fencing team.

Methods & Materials In the present study, 14 male players of the Epe national fencing team were divided into two creatine supplement groups (7 people) and ginseng supplement group (7 people). Subjects in two groups performed their normal exercises with the team during the research, and on the day before the measurement, after a specific activity in a sitting position, blood was taken from the arm vein of the subjects by a specialist. The statistical significance difference was determined at the level of $P \geq 0.05$ and ANCOVA test was used to determine the differences between groups and the data was analyzed by SPSS software, version 25.

Ethical Considerations This article was approved by the Ethics Committee of Islamic Azad University, Shahrood Branch (Code: IR.IAU.SHAHROOD.REC.1400.073).

Results The results showed that after six weeks, there is a significant difference between the creatine and ginseng groups in the blood indices of ammonia, LDL, HDL and homocysteine ($P \geq 0.05$). so that the average of creatine supplement group in ammonia, LDL, HDL and homocysteine index in terms of mg/dL respectively (2.56 ± 0.83 , 1.16 ± 0.33 , 7.45 ± 0.48 , 8.89 ± 0.18) and Ginseng group (2.05 ± 0.29 , 1.46 ± 0.78 , 8.11 ± 0.27 , 7.63 ± 0.45).

Conclusion The results showed that there is a significant difference in the average of blood ammonia, HDL, LDL and hemocytin between the creatine supplement group and the ginseng supplement group. Therefore, the role of ginseng supplement in reducing blood ammonia and homocysteine and in increasing HDL was more than that of creatine supplement, and the role of creatine supplement in reducing LDL was more than that of ginseng supplement. So it can be concluded that the role of ginseng supplement in the changes of blood ammonia, homocysteine and HDL is more than the role of creatine supplement.

Keywords:

Creatine Supplement, Ginseng Supplement, Ammonia, Homocysteine, Lipid, Fencing

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Extended Abstract

Introduction

Food and sports supplements are used by athletes all over the world, and correct and optimal consumption improves performance and prevents sports injuries. In this regard, creatine and ginseng supplements can be effective in physiological indicators and sports performance. On the other hand, the characteristics of physical fitness indicate having the necessary ability to perform skills correctly and achieve success in athletes in dynamic disciplines, such as fencing. Therefore, considering that no research has been done on the use of these supplements on blood indicators in fencers. The present study compared the effect of creatine and ginseng supplements on blood ammonia, HDL, LDL, and homocysteine indices of the male players of the Iranian Epee fencing team.

Materials and Methods

In the present study, 14 male players of the Epee national fencing team were divided into two creatine supplement groups (7 people) and a ginseng supplement group (7 people). During the research, the subjects in three groups performed their normal exercises with the team, and on the day before the measurement, after a certain activity in a sitting position, a specialist took 2 ml of blood from the arm vein of the subjects. In order to measure the level of homocysteine, HDL, and LDL in the blood, immediately after four minutes after the time of the subject's pedaling on the bicycle, the level of homocysteine, HDL, and LDL in their blood was measured with the Scout lactometer device made in Germany (mg/dL). The statistically significant difference was determined at the level of $P \geq 0.05$ and the ANCOVA was used to determine the differences between groups and the data were analyzed by SPSS software, version 25.

Results

The Shapiro-Wilk test was used to check the normal distribution of the variables. The results of this test for all variables showed the normality of the data ($P > 0.05$). Also, to check the assumption of homogeneity of variances, Levene's test was used, and the homogeneity of the variances of the groups' scores was confirmed ($P > 0.05$). Therefore, according to the above assumptions, ANCOVA was used to investigate the effect of exercises on the variables. The results showed that after six weeks, there was a significant difference between the creatine and ginseng groups in the blood indices of ammonia, LDL,

HDL, and homocysteine ($P \geq 0.05$). The average levels of ammonia, LDL, HDL, and homocysteine were creatine supplement group 2.56 ± 0.83 , 1.16 ± 0.33 , 7.45 ± 0.48 , and 8.89 ± 0.18 mg/dL and ginseng group 2.05 ± 0.29 , 1.46 ± 0.78 , 8.11 ± 0.27 , and 7.63 ± 0.45 in the ginseng group, respectively.

Discussion

The results showed that there was a significant difference in the average blood ammonia, HDL, LDL, and homocysteine levels between the creatine supplement group and the ginseng supplement group. The results showed that the ginseng supplement was more effective in reducing blood ammonia and homocysteine and in increasing HDL compared to the creatine supplement, and the creatine supplement was more effective in reducing LDL compared to the ginseng supplement.

Regarding blood ammonia, the results of Attarzadeh et al.'s study (2018) showed that ginseng supplementation causes a significant decrease in ammonia concentration, which is similar to the results of this study [19]. Ammonia is formed in the kidneys as a result of the activity of phosphate-dependent and non-phosphate-dependent glutaminase enzymes, and all the produced NH_3 appears in primary ducts as NH_4^+ ammonium ions. Since there is no ammonium secretion mechanism in the urinary collecting ducts, and there is not much permeability to it, a small percentage of ammonia in the interstitial water is released into the ducts through non-ionic diffusion. Also, if the pH of urine increases due to the injection of bicarbonate or acetazolamide, ammonium is decomposed and ammonia is released into the blood. In this regard, it has been reported that long-term intense exercise will increase plasma ammonium levels. Also, the increase observed in professional athletes is less.

It can be concluded ginseng supplement is more effective in changes in blood ammonia, homocysteine, and HDL than creatine supplement.

Ethical Considerations

Compliance with ethical guidelines

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Authors' contributions

All authors participated in the design, execution, and writing of all parts of this research.

Conflicts of interest

According to the authors, this article has no conflict of interest.

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