

Caffeine effects on physical performance and sport-specific skills in elite youth soccer players: a randomized trial using the balanced placebo design

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Background

There is a lack of studies on the effect of caffeine relatively high doses on the performance and sports-specific skills of young soccer players conducted under stereotypical conditions [1]. The main study objective was to examine the pharmacological and expected effect of acute caffeine injection (400 mg) on speed, strength, speed endurance, dribbling, and change of direction in elite young soccer players on a soccer field under stereotypical conditions.

Methods

54 soccer players (age 15.93 ± 0.8 years, height – 180 ± 8.28 cm, weight – 69.45 ± 8.82 kg, BMI – 21.36 ± 1.37 kg/m², somatic maturation degree – 98.05 ± 1.90), from a leading Russian soccer academy took part in a randomised trial using the balanced placebo design.

They were divided into 4 groups: 1 - told caffeine/given caffeine, 2 - told caffeine/given placebo, 3 - told placebo/given placebo, 4 - told placebo/given caffeine. All participants consumed two identical capsules 60 minutes before testing, each containing 200 mg of caffeine or placebo.

Physical performance and sport-specific skills were assessed using: 5, 10, 20 and 30 metre sprint, counter-movement jump, change of direction, dribbling, T-test and RSA test. The incidence of side effects was assessed 24 hours after caffeine consumption using a questionnaire [2].

Results

The data obtained showed that a single caffeine dose of 400 mg 60 minutes prior to the start had a positive effect in groups 1 and 4 on such parameters of the RSA test such as fatigue index ($p<0.001$) and the percentage decrement score ($p<0.001$). No such effects were observed in groups 2 and 3. In group 1, there was a statistically significant improvement in dribbling performance ($p<0.048$), while in group 4 there was only a tendency ($p<0.064$). At the same time, caffeine had no effect on sprint time, change of direction or jump height. The caffeine regimen was also shown to be safe – there was no statistically significant difference in the incidence of side effects between the groups ($p=0.56$). No influence of caffeine expectancies on performance was observed

Conclusion

The acute caffeine ingestion of 400 mg can be considered justified and safe in young soccer players aged 15-17 years with a high degree of somatic maturation.

Keywords: caffeine, young athletes, repeat sprint ability, soccer, sprint, strength, side-effects

References

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