



The caffeine effect on tolerance to sport-specific maximal intensity exercise in young elite soccer players



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Introduction

Modern elite soccer places extremely high demands on the athlete's body, so it is of practical interest to study the effect of various dietary supplements on load tolerance and post-exercise recovery. There is a lack of research on the effects of caffeine consumption on commonly used indicators of load tolerance in soccer such as delayed onset muscle soreness (DOMS), rate of perceived exertion (RPE), and heart rate (HR) at different time points after the end of exercise.

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 participated in a randomized trial using a balanced placebo design. For 48 hours prior to the testing, the players refrained from high-intensity training and consumption of pharmacological substances.

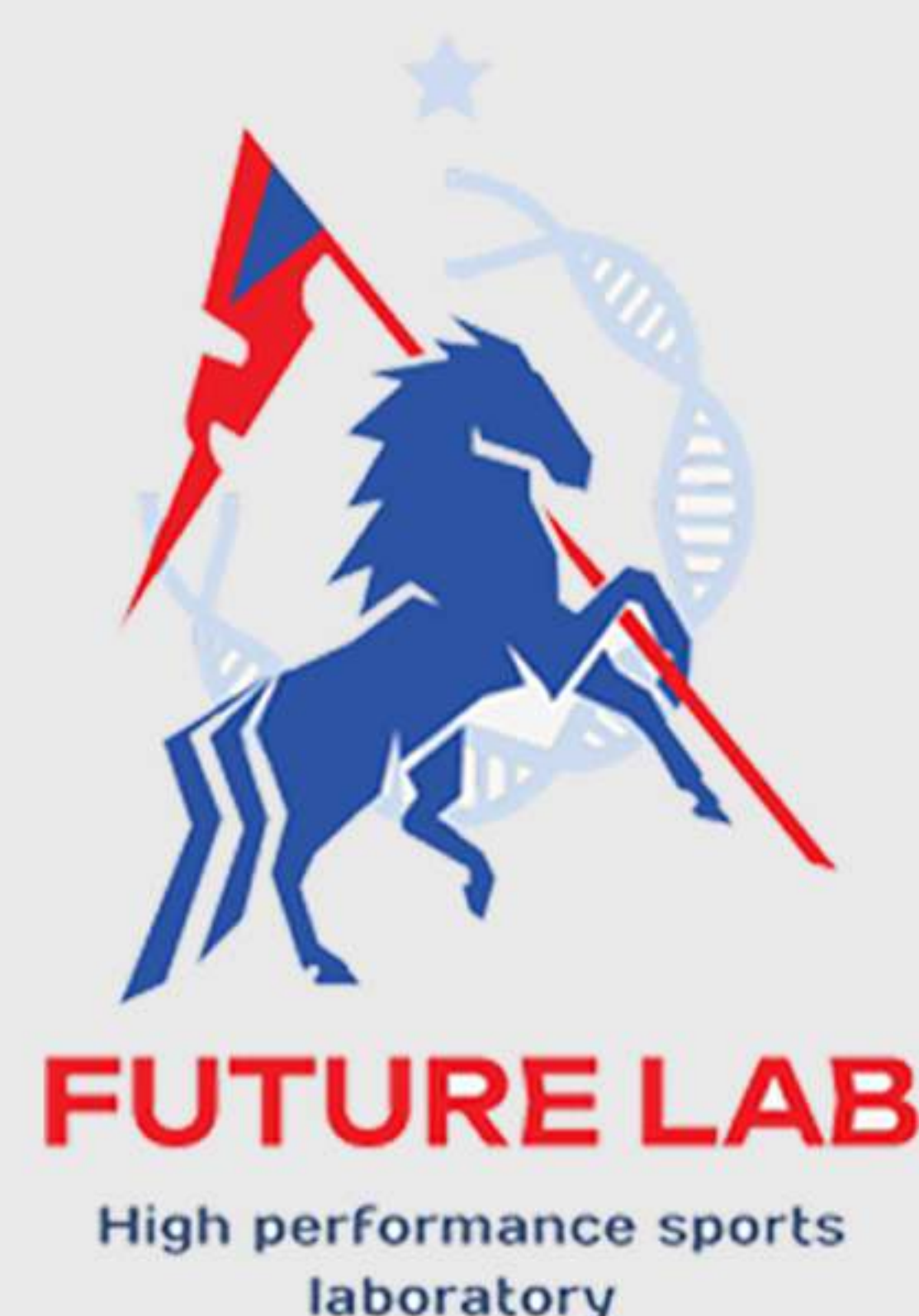
The participants were divided into four groups:

- Told caffeine/given caffeine
- Told caffeine/given placebo
- Told placebo/given placebo
- Told placebo/given caffeine

- High-intensity sports-specific load:
- 5, 10, 20, and 30 meter sprints
 - Counter-movement jump
 - Change of direction
 - Dribbling
 - T-test
 - RSA test

All participants consumed two identical capsules 60 minutes before testing, each containing 200 mg of caffeine or placebo.

Heart rate (HR) was measured using the Activio Sport Solution GPS tracking system. Data collected included HR immediately post-exercise after the last test, HR after two minutes of passive rest, and recovery HR.



Results

The data obtained demonstrated that a single caffeine intake (400 mg) 60 minutes before testing had no effect on RPE ($p = 0.948$), HR_{pe} ($p = 0.698$), and HR_{rec} ($p = 0.920$) in any of the groups. DOMS severity 24 hours after the load was not statistically significant between the groups ($p=0.077$).



Conclusion

The acute caffeine ingestion of 400 mg does not affect the subjective and objective indicators of training load in young soccer players aged 15-17 years with a high degree of somatic maturation.



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