

Effect of caffeinated gum on a battery of soccer-specific tests in trained university-standard male players

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1. Introduction

Caffeine is a popular ergogenic aid used by many team sport athletes (1). Caffeine has been repeatedly shown to improve multiple sprint performance during simulated team sport activities (2,3) as well as improving passing accuracy and jump performance in trained male soccer players (4).

Caffeine acts as an adenosine receptor antagonist, thus reducing the perception of effort at a given intensity and increasing central drive (5). Traditionally, caffeine is provided in a capsule or beverage form one hour prior to exercise, with peak plasma caffeine levels occurring between 15 to 120 minutes post-ingestion (6). Caffeine encapsulated in chewing gum is rapidly absorbed into the blood stream via the buccal mucosa, resulting in a faster onset of effects compared to the more traditional modes (i.e. 5-min versus 45-min, respectively) (7). This may be beneficial for team sport athletes where there is limited time for nutrition intervention during competition (e.g. half-time) and for those intolerant to caffeinated beverages.

To date, no studies have examined the effects of caffeinated chewing gum on soccer performance, despite the apparent ergogenic effects of caffeine on actions associated with success in soccer and the practical benefits of this particular mode of administration. Therefore, the purpose of this study was to determine whether a low dose of caffeine (200 mg) provided in a chewing gum would improve performance in a battery of soccer-specific tests typically used by teams to assess performance and fitness.

2. Objective

The purpose of this study was to determine whether chewing caffeinated gum would improve performance in a battery of soccer-specific tests typically used by professional teams to assess performance and fitness.

It was hypothesised that chewing caffeinated gum would enhance performance on 20 m sprint times, countermovement jump test and the Yo-Yo IR 1.

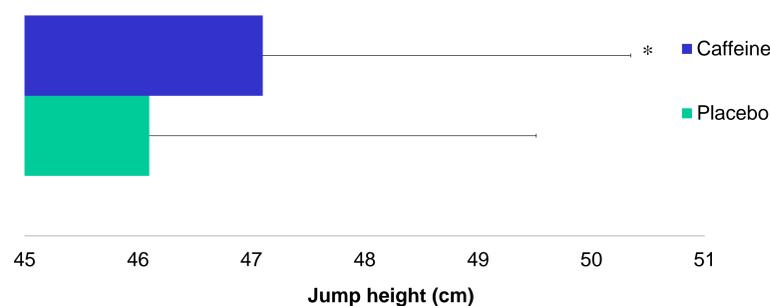


Figure 1. Mean countermovement jump height (cm) for placebo and caffeine trials. * $p < 0.05$

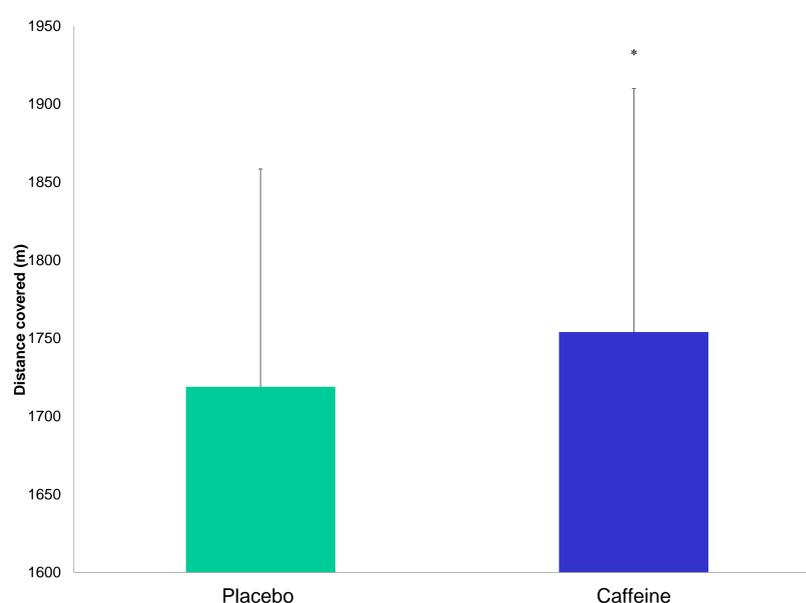


Figure 2. Mean distance (m) covered in Yo-Yo intermittent recovery test level 1 for placebo and caffeine trials. * $p < 0.05$

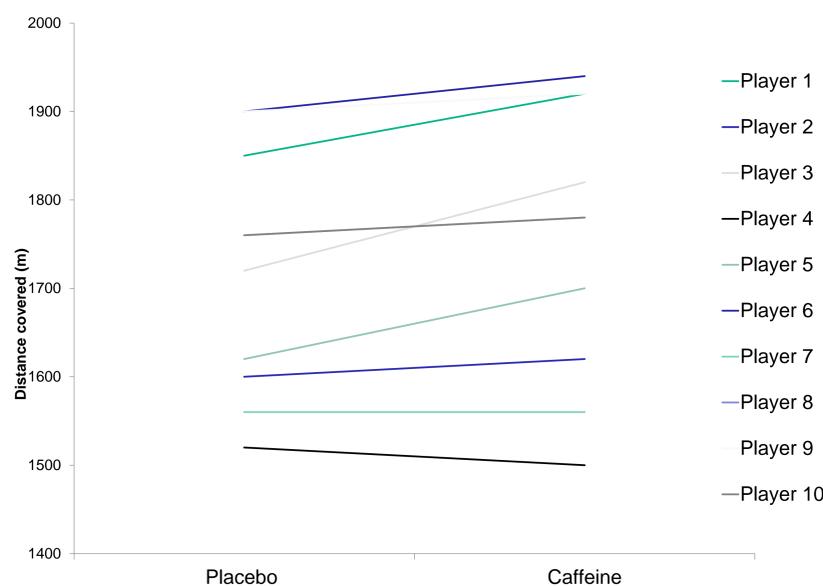


Figure 3. Individual distance (m) covered in Yo-Yo intermittent recovery test level 1 for placebo and caffeine trials.

5. Conclusions

Chewing caffeine gum for 5 minutes immediately before performing a battery of soccer specific tests enhanced performance by 2.04% on the Yo-Yo IR1 and by 2.17% on the maximal countermovement jump test but has no effect on 20 m sprint times in trained university-standard soccer players. These results are consistent previous studies and show that gum is as effective as other sources of caffeine.

3. Methods

In a double-blind, randomised design, ten trained university-standard soccer players (age 19 ± 1 years; body mass 75.5 ± 4.8 kg; stature 1.80 ± 0.10 m) were recruited after gaining institutional ethics approval.

Participants were instructed to limit caffeine intake to 50 mg per day for 48 hours before each testing session.

After a familiarisation trial, participants chewed a caffeinated gum (Military Energy Gum, Chicago, IL) that contained 200 mg of caffeine and a placebo gum with the same appearance on two separate occasions separated by 7 days.

After a standardised warm up, the gum was chewed for 5 minutes before participants performed a 20 m sprint using timing gates (Brower Timing System; USA), a maximal countermovement jump test (Optojump Next; Micro Grate; USA) and the Yo-Yo intermittent recovery test level 1 (Yo-Yo IR1).

4. Results

Performance on 20 m sprint times did not change (caffeine = 3.2 ± 0.3 vs placebo = 3.1 ± 0.3 s; $P = 0.567$) however, the caffeinated gum did allow players to cover a greater distance on the Yo-Yo IR1 (caffeine = 1754 ± 156 vs placebo = 1719 ± 139 m; $P = 0.016$) and increased maximal countermovement jump height (caffeine = 47.1 ± 3.4 vs placebo = 46.1 ± 3.2 cm; $P = 0.008$).

6. References

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