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ORIGINAL ARTICLE

The effects of caffeine on rugby passing accuracy while performing the Reactive Agility Test



Effet de l'ingestion de caféine sur la précision de passes de ballons et l'agilité des mouvements avant et après une simulation d'un match de rugby

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KEYWORDS

Caffeine;
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Summary

Aim. – Caffeine has been observed to improve performance of high-intensity and endurance exercise, but its effects on passing accuracy and reactive agility seen in intermittent high intensity team sports such as rugby and hockey are unclear. The purpose of this investigation was to determine the effect of ingesting caffeine on passing accuracy and agility speed before and after a simulated rugby protocol (SRP).

Methods. – Nine male amateur rugby union players volunteered to participate in the study. The first visit participants undertook the multistage fitness test to estimate maximal oxygen consumption levels. On the second and third visits, a passing accuracy test (PAT) was undertaken which involved a modified reactive agility speed test that pressured the participants to pass into a target at the end of each run pre and post the 40-minute SRP. Participants ingested either 6 mg.kg.bw⁻¹ of caffeine (CAF) or a placebo (PL) 60 minutes prior to the start of the SRP.

Results. – CAF maintained sprint speed after the SRP whereas it decreased during PL trial. However, there were no effect of CAF on PAT scores ($P > 0.05$) nor was there an effect on RPE ($P > 0.05$). The results of the study lend some support to findings illustrating beneficial effect of caffeine ingestion before a simulated rugby protocol.

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MOTS CLÉS

Caféine ;
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Résumé

Objectif. — La caféine est connue pour améliorer les performances d'exercices intermittents répétés de haute intensité ; cependant, ses effets sur la précision de passes et l'agilité des mouvements dans les sports de l'équipe comme le rugby n'ont pas été précisément étudiés. Le but de cette étude était de déterminer l'effet de l'ingestion de caféine sur la précision de passes de ballons et l'agilité des mouvements sur le terrain, avant et après une simulation d'une mi-temps d'un match de rugby (40 min, SR).

Sujets et méthodes. — Neuf joueurs amateurs ont participé à l'étude. Au cours de leur première visite au laboratoire, ils ont réalisé un test de terrain permettant d'estimer de manière indirecte la consommation maximale d'oxygène (VO_2max). Au cours des visites suivantes, ils ont réalisé un test de précision de passes (PP) ainsi qu'un test d'agilité au cours de mouvements rapides (VARM). Ils devaient passer dans une cible avant et après la SR de 40 minutes. Tous les sujets ont ingéré soit 6 mg/kg de caféine (CAF), soit un placebo (PL), 60 min avant le début de la SR.

Résultats. — La prise de caféine permet de maintenir la vitesse de sprint à l'issue de la simulation de mi-temps de rugby, comparativement à ce qu'elle était en début de match. À l'inverse, cette vitesse de course diminue lorsque les sujets consomment le placebo. Par contre, les résultats ne démontrent aucun effet spécifique de la caféine sur les scores de PP ($p > 0,05$) ou de RPE ($p > 0,05$). Les résultats de cette étude apportent une illustration des effets ergogéniques de la caféine, spécifiquement sur le maintien de la vitesse de course, à l'issue d'une mi-temps de rugby.

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1. Introduction

The importance of caffeine's use as an ergogenic aid has increased dramatically since the World Anti-Doping Authority (WADA) removed it from the list of banned substances in January 2004. As a result, research on its ergogenic benefits in relation to athletic performance has increased [1–3]. Caffeine has been unequivocally demonstrated to improve time to exhaustion and other indicators of endurance in several different physical activities including rowing, swimming, cycling, and running as well as rugby and football [1,4–6]. Moreover, the daily use of caffeine to provide added mental alertness and better focus in relation to its low cost and simplicity of consumption has made it a popular choice for improving athletic performance [2,7].

The mechanism of action of caffeine has been shown to be linked with the blocking of adenosine receptor sites that produce a stimulatory effect on the central nervous system (CNS) [8], which in turn may explain its ergogenic effects. In addition research has reported enhanced neural firing rates, reduction in feelings of fatigue, improved concentration and alertness, accuracy, and reactive time in trained athletes both in a lab and field-testing [6,9–12]. All these responses to caffeine would suggest that caffeine would improve performance in high intensity intermittent team sports such as rugby. Although caffeine's potential ergogenic effects on endurance performance have been thoroughly studied [3,13,14] research is still low in comparison when investigating the benefits of caffeine on team sports performance, such as football or rugby.

Stuart et al. [6] investigated caffeine's effect (6 mg.kg.bw⁻¹) on rugby performance while including an accuracy skill test which was included as part of the

simulated rugby test protocol. However, in his study the passing skill was performed in a static and closed skill manner that does not reflect the rugby game situation, so although they found an improvement in passing accuracy this may not be reflected in real rugby play. However, a more realistic accuracy skill test was performed in football by Fosket et al. [15] who examined the effects of caffeine ingestion (6 mg.kg.bw⁻¹) on cognitive and skill performance during simulated football activity. The authors used an open skill test to investigate passing accuracy where random audible cues were used as well as target identification which is more reflective of real play and they found an improvement in passing accuracy with caffeine. To further the support of use of caffeine on high intensity intermittent sports, Schneiker et al. [16] observed improvements in intermittent sprint ability in team sports players following the ingestion of 6 mg.kg.bw⁻¹ of caffeine. Positive performance benefits of caffeine have been found with concentrations as low as 1.9 mg.kg⁻¹ [17]. However, the majority of research which has found positive performance enhancing effects on rugby related performances have used higher doses (6 mg.kg.bw⁻¹) without any negative side effects [6,15,16].

To better determine whether caffeine has an effect on rugby performance the present study used the reactive agility speed test with an open skill test to examine the effects of caffeine ingestion (6 mg.kg.bw⁻¹) on rugby passing performance. The same passing accuracy test has been used as a valid and reliable test to measure an athlete's reaction agility time, decision-making and movement time [10,18]. The purpose of this investigation was to determine the effect of caffeine ingestion on rugby passing skill execution and the reaction agility time before and at the end of simulated 40-minute rugby half.

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