

P26- Performance-enhancing effects of a specific sports-drink protocol on fatigue during repeated singles tennis match play

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The purpose of this study is to investigate the response of a sports drink protocol on fatigue during repeated singles tennis match play in a placebo-controlled, double-blind crossover study. Eight well-trained tennis players participated in this study. Notational analysis, match intensity, perception of the effort, speed, agility, aerobic endurance, heart rate, blood glucose levels and neuromuscular fatigue were investigated before and after each tournament. The sports drink protocol had a positive effect on the players' perceived efforts, the latter felt less general and muscular fatigue. Moreover, higher game intensity, higher blood glucose levels, higher average heart rate and less fatigue on the triceps brachii after the matches were observed with the sports-drink protocol.

Keywords: exercise, sports drink, fatigue, perceived effort, heart rate

INTRODUCTION

A tennis player's effort fluctuates randomly from brief periods of maximal or near-maximal work to longer periods of moderate and low-intensity activity (Fernandez, Mendez-Villanueva, & Pluim, 2006). Tennis is also a sport based on unpredictability (Johnson, McHugh, Wood, & Kibler, 2006). Identifying optimal nutritional strategies is very important in order to avoid the occurrence of fatigue, since there is much evidence implying that reduction in skill-based performance - such as tennis - is linked to fatigue (Ferrauti, Pluim, Busch, & Weber, 2003). The purpose of this study is to investigate the effect of a new sports drink protocol where different sports drinks would be ingested before, during and after performance. We hypothesized that taking a pre-effort drink, an effort drink and a recovery drink, compared with placebo drink would decrease fatigue induced by repeated tennis matches.

METHODS

Eight well-trained male tennis players participated in this placebo-controlled, double-blind crossover study. Three different sports drinks had to be ingested. 1. Pre-match drink (mainly with caffeine and fructose, 30min before the matches), 2. Match-drink (mainly with caffeine, carbohydrates and amino acids), 3. Post-match drink (mainly with carbohydrates and proteins, 30min after the matches). All experimental tests were performed within two days where the players had to play three matches of two hours imposed time each. During the matches, heart-rate and rating of perceived exertion were measured. Maximal force and muscle endurance of the triceps brachii and quadriceps were measured directly after the matches. The effects of the sports drink protocol on the physiological responses and subjective responses were measured using a two-way ANOVA. The α -level was set at $p \geq 0.05$.

RESULTS

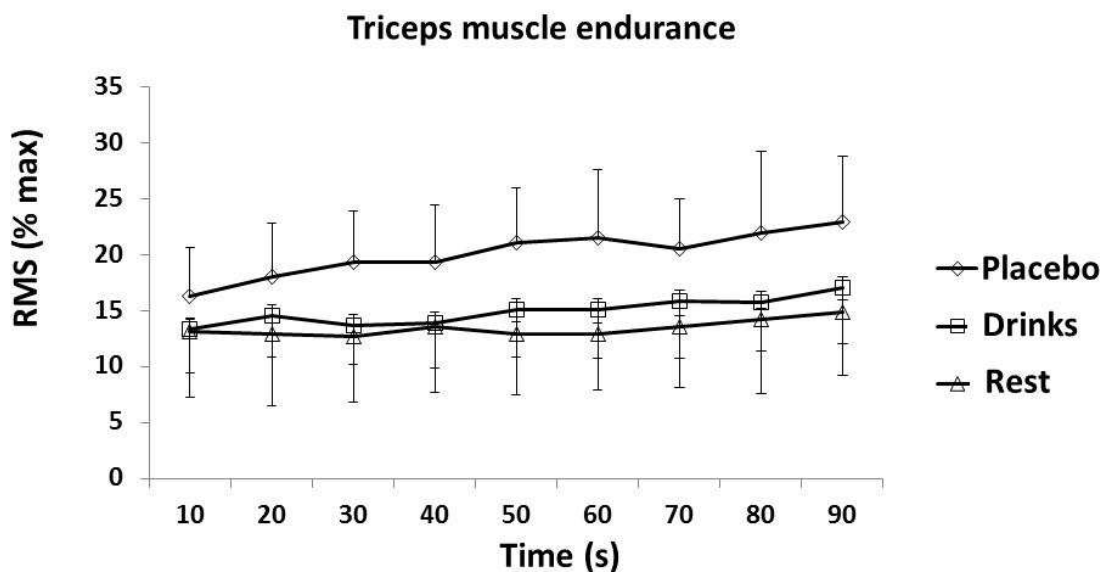


Figure 1. Mean values of electromyogram (EMG) Root Mean Square (RMS) of triceps brachii during 90sec of isometric contraction. ANOVA $p < 0,001$ group effect.

Mean heart rate was significantly higher during the matches with sports drink protocol compared with the placebo (127.9 ± 2.5 vs 120.1 ± 2.5 bpm, $p < 0.05$). The game intensity (mean shots/sec) was higher with sports drink protocol compared with the placebo. The perception of general and muscular fatigue were significantly higher during the matches with the placebo compared to sports drink protocol ($p < 0.05$). Triceps brachii muscle endurance was significantly higher after the matches with sports drink compared with placebo (Figure 1, $p < 0.05$).

CONCLUSION

In the present study we show that after ingesting a specific sport drinks protocol it is possible to reduce fatigue following prolonged intermittent work.

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