

Does caffeine influence salivary IgA responses in a dose-dependent manner following high-intensity treadmill exercise?

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ABSTRACT

Introduction: Caffeine ingestion is associated with enhanced athletic performance, with doses as low as 2 mg.kg⁻¹ body mass (BM) proving ergogenic. Bishop et al. (2006) have shown that ingesting a 6 mg.kg⁻¹ BM dose of caffeine 1 h prior to 90 min of cycle exercise at 70% $\dot{V}O_{2peak}$ causes a transient increase in saliva Immunoglobulin A (IgA) concentration both during and immediately following exercise. However, no research has identified if the same response occurs with either lower or higher doses of caffeine. As such the purpose of this study was to examine the dose-response effects of caffeine ingestion on salivary IgA responses following high-intensity running.

Methods: In a double blind randomised crossover design, 12 endurance trained male runners (age: 29 ± 3, $\dot{V}O_{2peak}$ 62.7 ± 5.1 mL.kg⁻¹.min⁻¹, mean ± SD) ran for 70 min at 80% $\dot{V}O_{2peak}$ 60 min after ingesting 0 (PLA), 2 (2CAF), 4 (4CAF), 6 (6CAF) or 8 (8CAF) mg.kg⁻¹ BM of caffeine. For PLA, 6 mg.kg⁻¹ BM of cornflour was ingested. Unstimulated whole saliva samples were obtained before supplementation, pre-exercise, after 35 min of exercise, immediately post-exercise and 1 h post-exercise. Saliva IgA was determined using ELISA, while caffeine concentrations were determined via HPLC.

Results: Saliva caffeine concentrations were significantly increased at all time points (pre-, mid-, post- and 1 h post-exercise) when compared to pre-supplement in a dose-dependent manner (P<0.001; peak concentration: PLA: 0 ± 0; 2CAF: 10 ± 3; 4CAF: 22 ± 8; 6CAF: 40 ± 9; 8CAF: 44 ± 9 μM). However, there was no dose-response effect of caffeine on either saliva IgA concentration or secretion rate before, during or after exercise. In fact neither caffeine nor exercise affected saliva IgA secretion rate or concentration.

Conclusion: These findings suggest that caffeine ingestion (from 2-8 mg.kg⁻¹ BM) 60 min prior to prolonged high-intensity treadmill running has no effect on saliva IgA responses following exercise. As such it can be suggested that athletes wanting to consume caffeine for ergogenic purposes can potentially do so (up to a dose of 8 mg.kg⁻¹ BM) without reducing mucosal immunity.

Reference:

Bishop NC et al. *Med Sci Sports Exerc.* 2006; 38(3): 513-519.