

## Effects of Caffeine Dose Timing on the Time-Course of Diuresis during Sodium-Aided Hyperhydration

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### ABSTRACT

When used alone, both caffeine and sodium-aided hyperhydration (SAH) can be ergogenic. Caffeine, when used with SAH, promotes diuresis, but hyperhydration can be achieved, albeit at lower levels than with SAH alone. In previous caffeine and SAH work, caffeine induced diuresis occurred only within 15 min of consumption of a bolus of caffeine, NaCl, and H<sub>2</sub>O. This suggests that caffeine-induced diuresis may occur for only 15 min after its consumption, and/or that the diuretic effect of caffeine is dependent on hydration levels. Caffeine has been shown to be ergogenic when taken as little as 5 min before exercise; thus, determining the temporal aspects of caffeine induced diuresis in conjunction with SAH may lead to better pre-exercise nutritional strategies. **PURPOSE:** To determine the effect of caffeine, consumed at different time-points, on diuresis over a 90 min SAH protocol. **METHODS:** Subjects were 17 males (23 ± 5 yr, 177 ± 8 cm, 83.4 ± 15.3 kg). Each performed 2, 90 min SAH trials beginning with a bladder void and measurement of urine specific gravity (USG) followed by ingestion of 15 mL H<sub>2</sub>O · kg bm<sup>-1</sup> with one of two treatments: 70.5 mg NaCl + 5 mg caffeine · kg bm<sup>-1</sup> taken at the start of the trial (NaCaf0), or 70.5 mg NaCl · kg bm<sup>-1</sup> taken at the start and 5 mg caffeine · kg bm<sup>-1</sup> taken at 75 min of the trial (NaCaf75). After consuming the H<sub>2</sub>O, subjects performed a measured bladder void every 15 min for 90 min. USGs were compared using a paired t-test. Urine excretions (UE) for each bladder void of the trials were expressed as a percentage of the total H<sub>2</sub>O consumed and compared with a two-way repeated measures ANOVA and Sidak post hoc analyses. **RESULTS:** USGs were 1.007 ± 0.004 (NaCaf0), and 1.009 ± 0.004 (NaCaf75) (P = 0.30). UE for NaCaf0, and NaCaf75, respectively at the urine collection points were 15 ± 9%, 7 ± 6% (15 min, P < 0.01), 15 ± 5%, 9 ± 2% (30 min, P < 0.01), 18 ± 5%, 14 ± 4% (45 min, P = 0.05), 15 ± 5%, 11 ± 6% (60 min, P = 0.05), 10 ± 5%, 8 ± 6% (75 min, P = 0.25), and 7 ± 5%, 6 ± 3% (90 min, P = 0.88). **CONCLUSIONS:** Although consuming caffeine at the start of the trial resulted in significantly greater diuresis for the first 30 min of the trial, waiting to consume caffeine until 75 minutes after the consumption of the water and NaCl did not result in caffeine induced diuresis 15 min after consumption of the caffeine.