Potential Use of a Controlled Release Coconut Hydrogel on Endurance Exercise Performance in a Hot-humid Condition

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Introduction: A controlled release coconut hydrogel which releases essential supply of nutrients and energy for up a period of up to two hours was recently developed. The potential ergogenic effect of this gel on endurance exercise performance in a hot-humid condition was examined.

Methods: Ten healthy trained cyclists performed steady state (SS) exercise at 65% VO_{2peak} for 45 min followed with a 10 km time-trial (TT) in a hot-humid (HH) condition (32^{o}C and 75% RH). Participants were randomly given a water-based hydrogel (W-Gel) or a coconut-based hydrogel (C-Gel) 30 minutes prior to the start of each trial while maintaining a euhydrated state. Gas exchange (VO_2), heart rate (HR), rectal (T_{re}), mean skin temperature (T_{sk}) and psychological measures were recorded at regular interval.

Results: There was no significant difference in TT between C-Gel and W-Gel (12.7±2.6 vs. 13.6±3.8 min; p = 0.153). The steady state exercise data indicated both core and mean skin temperature was not significantly different between C-Gel and W-Gel, respectively (38.9±0.2 vs. 38.8±0.3 ^{o}C; p = 0.127 and 35.69±0.67 vs. 35.47±0.63 ^{o}C; p = 0.607). Heart rate was also not significantly affected between the two trials (155±15 vs. 152±13; p = 0.261). Similarly, ratings of perceived exertion and thermal comfort were not significantly affected (p>0.05).

Conclusions: The current observation indicated that hydrogel provided no ergogenic benefit within ~60 min of exercise in a HH condition. This is consistent with the earlier understanding that ~60 min of exercise performance among well-trained athletes are not compromised when they are euhydated at the onset of exercise.

Keywords: Hydrogel, Endurance Exercise, Heat Stress