Drinking to thirst may not optimize prolonged cycling performance in a warm environment.

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INTRODUCTION: Proper hydration is important to maintain cardiovascular and thermoregulatory functions and optimize performance during prolonged endurance exercise. For exercise lasting 1 to 2 hours, programmed fluid intake (PFI) and *ad libitum* drinking have similar effects on cycling and running endurance performance (1). To our knowledge, the impact of the fluid intake strategy on endurance performance during exercise lasting more than 3 hours has yet to be studied in a controlled environment. Therefore, the aim of this study was to compare the effect of PFI and thirst driven fluid intake (TDFI) on prolonged cycling performance.

METHODS: Eight male endurance athletes (26 ± 6 yrs; VO_2peak : 67 ± 4 mL · kg^{-1} · min^{-1}) were recruited to complete two experimental trials consisting of 5 hours of cycling on a Computrainer™ at 60% VO_2peak followed by a 20 km time-trial (TT) in a randomized, crossover and counterbalanced sequence. The experiments were conducted under a warm ambient temperature (30°C, 35% relative humidity). A familiarization trial consisting of 2 hours at 60% VO_2peak followed by a 20 km TT was used to estimate the fluid intake needed to limit the body mass loss to 1% for the PFI condition. During the TDFI trial, participants were requested to drink based on their perceived thirst.

RESULTS: This is an ongoing study; hence findings are reported for n=6. Fluid consumption was greater for PFI with 7082 mL, compared to 5246 mL for TDFI. Body mass loss reached 1.3% for PFI, compared with 2.7% for TDFI. Average power output for the 20 km TT was higher ($p < 0.05$) for PFI (279 ± 44 W) than TDFI (264 ± 46 W). A time ($p < 0.01$), but not condition or interaction effect was observed for heart rate and rectal temperature. At the end of the 5 hours at a fixed workload, blood sodium was higher ($p < 0.05$) for TDFI (144 ± 2 mmol/L) than PFI (140 ± 3 mmol/L). There were no differences between conditions for perceived thirst, abdominal discomfort and perceived heat stress, but a higher perceived exertion was observed during TDFI ($p = 0.05$).

CONCLUSION: These preliminary results suggest that TDFI may not optimize performance during a prolonged cycling exercise in a warm environment, so endurance athletes competing in the heat for 5 hours may benefit from planned fluid intake that aims to limit their body mass loss to ~1%.

1) Goulet & Hoffman, Sports Med, 2019.