Carbohydrate Supplementation and the Lymphocyte Proliferative Response to Long Endurance Running


This randomized, double-blinded, placebo controlled study examined the influence of 6% carbohydrate ingestion on hormonal and lymphocyte proliferative responses (5 total samples over 9 hours) to 2.5 h of high-intensity running by 30 experienced marathon runners. The T-cell response differed between groups, with the placebo group exhibiting a greater increase immediately post-run and greater decrease at 3 h of recovery. No group differences were observed for Con A-, PHA-, or PWM-induced lymphocyte proliferation. However, when PHA was adjusted per T-cell, group differences were observed, highlighted by a decrease in the placebo group immediately post-run. Glucose and cortisol responses differed between groups, with glucose lower and cortisol higher in the placebo group immediately post-run. Post-run glucose correlated negatively with post-run cortisol ($r = -0.670, P < 0.001$) and epinephrine ($r = -0.540, P = 0.002$). Post-run cortisol also correlated negatively with total lymphocytes and T-cells at 1.5 hours ($r = -0.429, P = 0.018$ and $r = -0.424, P = 0.019$, respectively) and 3 hours ($r = -0.566, P = 0.001$ and $r = -0.523, P = 0.003$, respectively) of recovery. The pre- to post-run change in glucose correlated to the same changes in PHA/T-cell ($r = 0.456, P = 0.011$). The data support an interactive effect of carbohydrate ingestion on plasma glucose and cortisol. The data support an interactive effect of carbohydrate ingestion on plasma glucose and cortisol, T-cell trafficking, and cell-adjusted PHA-induced lymphocyte proliferation following long endurance running.