Influence of Exercise Mode and Carbohydrate on the Immune Response to Prolonged Exercise


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The influence of exercise mode and 6% carbohydrate (C) versus placebo (P) beverage ingestion on lymphocyte proliferation, natural killer cell cytotoxicity (NKCA), Interleukin (IL)-1β production, and hormonal responses to 2.5 hr of intense running and cycling (~75% VO2max) was measured in 10 triathletes serving as their own controls. The C versus P condition (but not exercise mode) resulted in higher plasma glucose concentrations, lower plasma cortisol concentrations, reduced postexercise lymphocytosis and NKCA, and a lessened T-cell reduction during recovery. No condition or mode effects were observed for concanavalin A and phytohemagglutinin-induced lymphocyte proliferation. Significant mode (but not condition) effects were observed for lipopolysaccharide-induced IL-1β production over time. However, when expressed per monocyte, the mode effect was abolished and a sustained suppression in IL-1β/monocyte was observed in all sessions throughout recovery. These data indicate that carbohydrate ingestion significantly affects plasma glucose and cortisol concentrations, blood lymphocyte counts, and NKCA, whereas exercise mode has no effect on these parameters.